Hurricane Irma

Emergency Evacuation Report and Recommendations

Prepared By:

The Florida Department of Transportation

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1.0 EXECUTIVE SUMMARY

During the period of September 5 to September 15, 2017, Florida was impacted by Hurricane Irma, one of the most powerful Atlantic hurricanes recorded in the history of the United States. An estimated 6.8 million people were ordered to evacuate, according to the Florida Division of Emergency Management (FDEM).

On October 12, 2017, Governor Scott directed the Florida Department of Transportation (Department) to examine ways to expedite emergency evacuation along the Interstate 75 (I-75) corridor, specifically between Wildwood and the Florida-Georgia state line.

The study area encompasses north central Florida with the northern boundary at the Georgia state line extending east to Interstate 95 (I-95) and west to US 98/US 19/Alt US 27. The study corridor is defined as I-75 and two parallel north/south facilities, US 98/US 19/US 27 west of I-75 and US 301 east of I-75.

The Department has conducted the analysis and identified the following:

1. Extend existing Emergency Shoulder Use (ESU) plans for feasible corridors;
2. Construct additional lanes at the I-75/Florida's Turnpike Enterprise (Turnpike) Interchange for increased throughput;
3. Fill in the gaps where there are no cameras or Dynamic Message Signs (DMS);
4. Coordinate with the Georgia Department of Transportation (GDOT);
5. Develop signal timing adjustments for signalized intersections along US 98/US 19/US 27 and US 301 to provide increased throughput during emergency evacuations;
6. Expand emergency roadside services (Road Ranger service patrols [RRSP] and wrecker services on key evacuation corridors; and
7. Identify additional methods to enhance dissemination of information to the public.

If Directed, the Department could implement the following to address to increase the efficiency of evacuations:

Additional ESU plans could be developed for these feasible corridors:

- I-75 northbound from the beginning of Alligator Alley in Fort Lauderdale through Fort Myers to the Georgia State Line
- Turnpike Mainline (SR 91) northbound from Orlando to I-75
- I-95 northbound from the City of Jupiter at SR 706 (West Indiantown Road) to south of Jacksonville at CR 210)
- I-10 westbound from I-75 to US 221 east of Tallahassee

ESU feasibility can also continue to be evaluated for the Turnpike Mainline from Palm Beach to Orlando. The interchange of I-75 and the Turnpike Mainline in Wildwood will still be under construction at the start of the 2018 hurricane season. Once construction is complete in summer of 2019, the improved interchange will address weaving or lane changes between the interstate and the Turnpike Mainline traffic as well as add two auxiliary lanes to the Turnpike Mainline northbound movement. The segments of I-75

from Wildwood to the Georgia state line currently without roadside devices such as cameras and DMS could be available by next hurricane season. The Department could also increase its coordination with Georgia for evacuation route planning and implementation. The use of the US 98 / US 19 / US 27 corridor and US 301 were determined to provide increased throughput during emergency evacuations. The Department could modify the signal timing along these corridors for increased traffic flow to assist in expediting evacuation. Building on the success of the methods used during Hurricane Irma, public outreach could also be improved to enhance public information on route choices.

2.0 INTRODUCTION

On October 12, 2017, Governor Scott directed the Florida Department of Transportation (Department) to examine ways to expedite emergency evacuation along the Interstate 75 (I-75) corridor, specifically between Wildwood and the Florida-Georgia state line, during emergencies such as hurricanes. A copy of the news release containing the Governor's direction is in ***Appendix A***.

The purpose of this report is to identify actions the Department could implement, both prior to next hurricane season and longer-term actions, to expedite large scale evacuations during emergencies in a safe and efficient manner.

2.1 Study Area

The study area is broader than the corridor Governor Scott has targeted in his directive because of the effect the traveling public and tributary roadways have on reaching the I-75 corridor north of Wildwood. Therefore, the study area encompasses north central Florida with the northern boundary at the Florida-Georgia state line extending east to Interstate 95 (I-95) and includes eighteen counties: Alachua, Bradford, Clay, Citrus, Columbia, Dixie, Duval, Flagler, Hamilton, Jefferson, Levy, Madison, Marion, Nassau, St. Johns, Sumter, Taylor, and Volusia. The following major north/south facilities included in the study area are:

- I-75 from Wildwood to the Florida-Georgia state line;
- I-95 from I-4 to the Florida-Georgia state line;
- US 98/US 19/US 27 from Citrus County to Interstate 10 (I-10);
- US 27 from Ocala to US 98/US 19/US 27; and
- US 301/441 from south of Wildwood to north of Ocala.

The study area is shown in *Figure 1*.

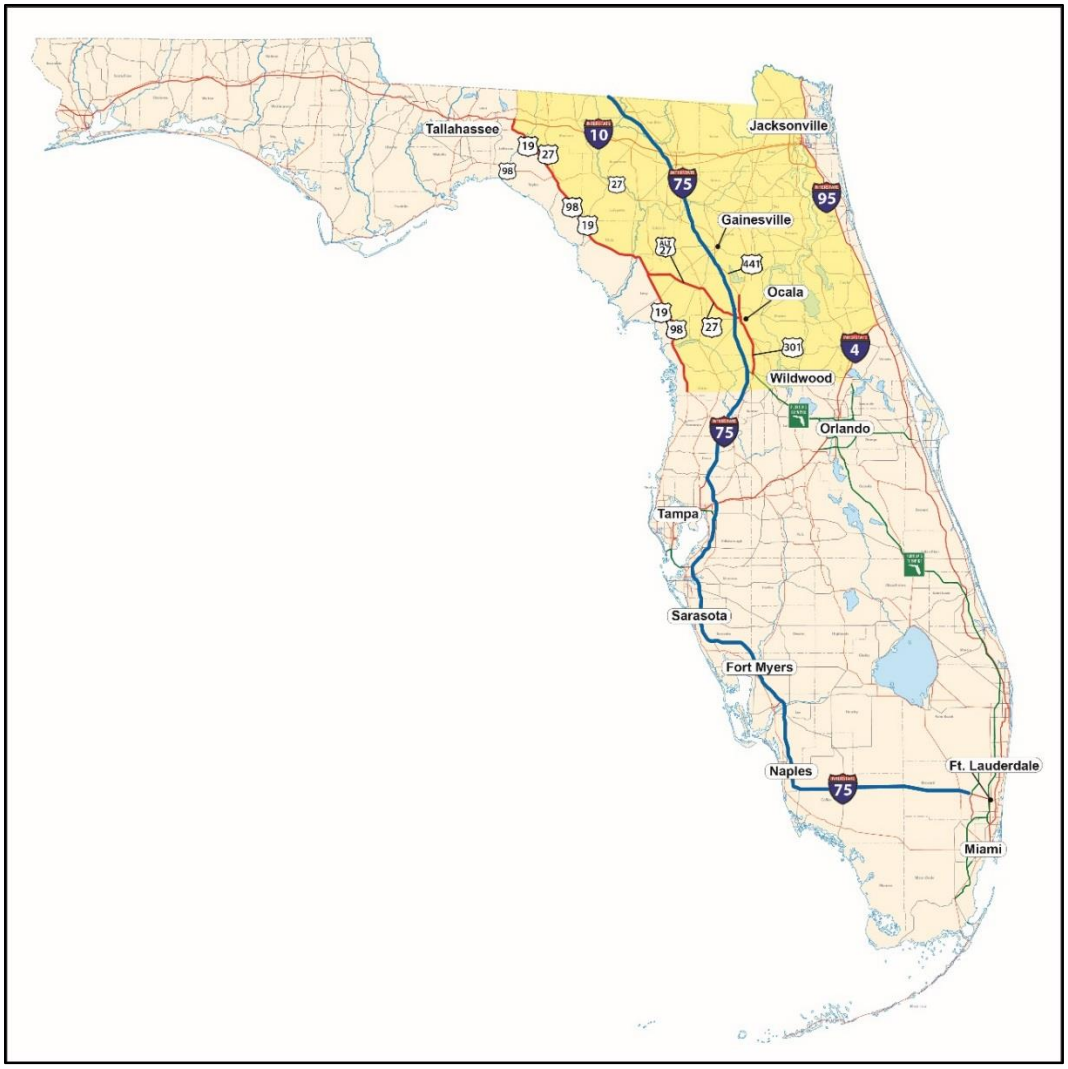


Figure 1. Study Area

2.2 Study Corridor

The study corridor is defined as I-75 and two parallel north/south facilities, US 98/US 19/US 27 west of I-75 and US 301 east of I-75. The limits of each facility as shown in *Figure 2* are:

- I-75 from Turnpike Mainline in Sumter County to the Florida-Georgia state line in Hamilton County
- US 98/US 19 from the terminus of the Suncoast Parkway in Citrus County to the intersection with US 27 in Levy County
- US 98/US 19/US 27 from the intersection of US 98/US 19 with US 27 in Levy County to I-10 in Jefferson County
- US 27 from I-75 in Marion County to US 98/US 19 in Levy County
- US 301 from the Turnpike Mainline in Sumter County to the US 441/US 301 split in Marion County

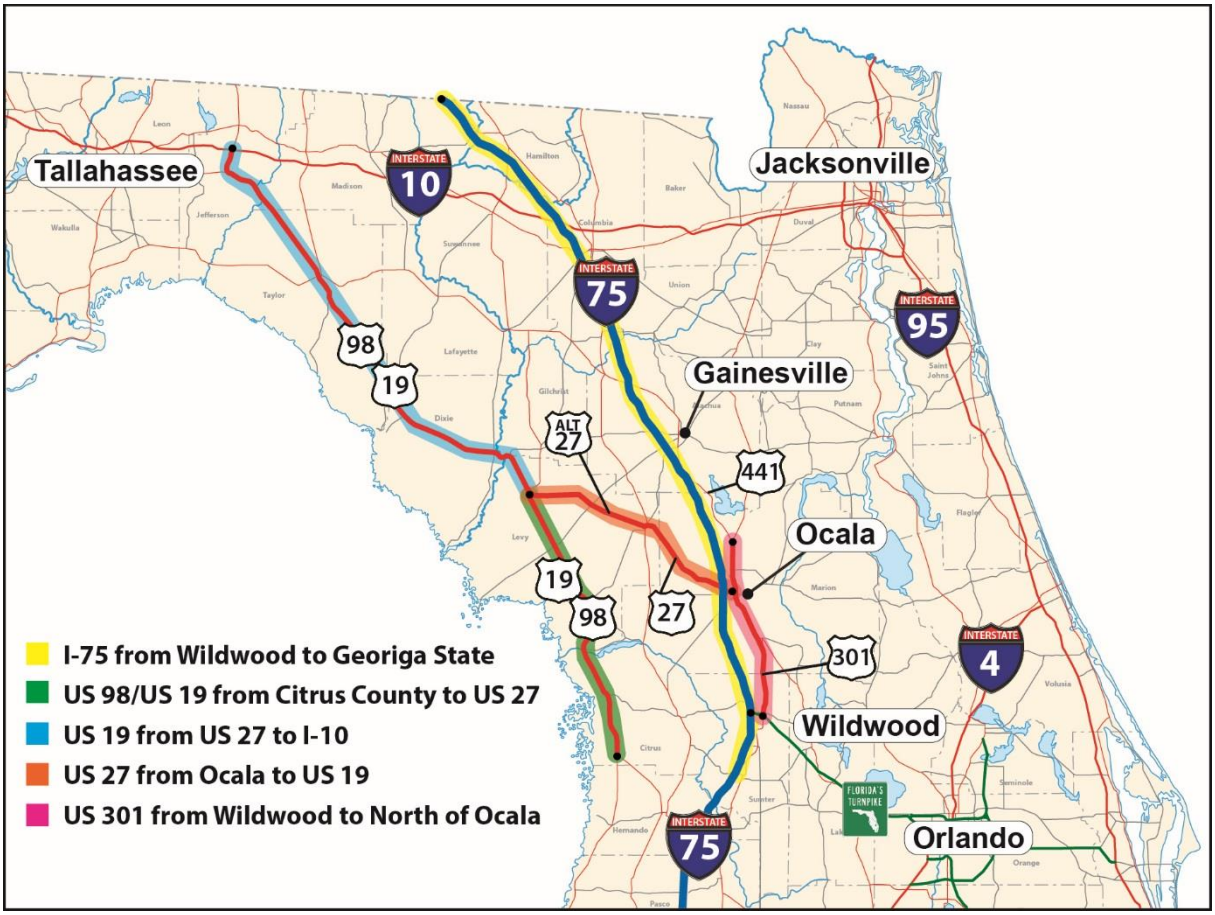


Figure 2. Study Corridor Limits.

3.0 EXISTING CORRIDOR CONDITION AND NEEDS

I-75 is a north/south interstate facility providing major passenger and freight movement for the State as well as emergency evacuation for people from Florida's southwest coast, southeast coast, and central Florida, including the major population centers of Tampa, Sarasota, Fort Myers, Naples, Fort Lauderdale, Miami and Orlando.

I-75 has been the focus of a recent study through the I-75 Relief Task Force and subsequent north I-75 Master Plan, which documented the corridor's unique characteristics. I-75 is defined by seasonal peaks in demand during holidays and/or special events, resulting in significant periods of non-recurring congestion. When considering these forms of non-recurring congestion in addition to lane closures due to incidents, and weather, I-75 results in conditions which warrant further consideration.

3.1 Number of Lanes

I-75 from the Turnpike Mainline in Sumter County to the Georgia State Line is a six-lane divided interstate facility with a speed limit of 70 miles per hour (mph). A typical section of I-75 is shown in

Figure 3. A truck lane restriction, implemented in August 1998, prohibits trucks from using the far-left lane of I-75.

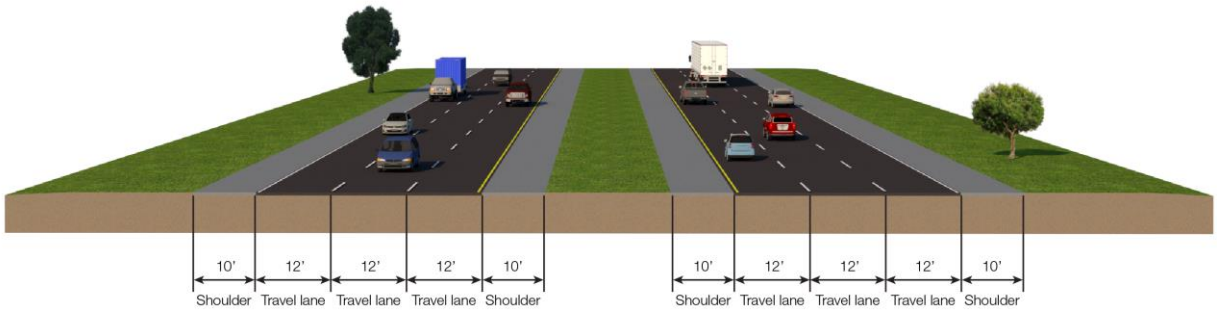


Figure 3. I-75 Roadway Typical Section

US 98/US 19 runs north/south and has several typical sections through the project study limits:

- US 98 is a four-lane divided facility from the terminus of the Suncoast Parkway in Citrus County to the intersection with US 19 south of Homosassa Springs in Citrus County (4 miles)
- US 98 joins with US 19 as a four-lane divided facility and continues north to the City of Crystal River in Citrus County (11.6 miles)
- A six-lane facility from SE 8th Avenue to NE 5th Street in the City of Crystal River (1 mile)
- A five-lane section (four-lane with center turn lane) to NW 6th Avenue in Crystal River in Citrus County (0.8 miles)
- A four-lane divided facility to the intersection of US 27 in Chiefland in Levy County (46 miles)
- US 98/US 19 joins with US 27 as a four-lane divided facility in Chiefland to I-10 in Jefferson County (160 miles)

SR 44 runs east/west with a speed limit that varies from 35 to 65 mph and has several typical sections through the project study limits:

- A four-lane divided facility from I-75 in Sumter County to US 41 in Inverness in Citrus County (15 miles)
- A five-lane section (four-lane with center turn lane) from Inverness to US 98/US 19 in Crystal River in Citrus County with short intermittent sections that are four-lane divided (17 miles)

US 27 runs northwest/southeast and has several typical sections through the project study limits:

- A four-lane divided from I-75 to Williston in Marion County (22 miles).
- US 27 becomes Alt 27 in Williston and continues to Chiefland (26 miles). Alt 27 is four lane divided facility except through Williston (from NE 203rd Ct to NW 7th Street), Bronson (from Town Ct to NE State Road 24), and Chiefland (from East Park Ave to Rodgers Blvd) where it is a five-lane section (four lanes and a center turn lane).
- US 27 joins US 98/US 19 as a four-lane divided facility.

US 301 runs north/south and is primarily a four-lane divided facility with a speed limit of 35 to 55 mph from the Turnpike Mainline in Sumter County to US 441 in Marion County, with the following exceptions through the project study limits:

- A five-lane facility (four lanes and a center turn lane) from SR 44 to north Old Wire Road in Wildwood in Sumter County (1.5 miles)
- A two-lane facility from SE Highway 42/SE 165th Street to SE 147th Street north of Dallas in Marion County (1.5 miles)
- A three-lane (two lanes and a center turn lane) from SE 147th Street to SE 145th Place north of Dallas in Marion County (1 mile)
- A five-lane facility (four lanes and a center turn lane) from SE Babb Road in Belleview (1.0 mile)
- A seven-lane facility (six lanes and a center turn lane) from SE 1st Avenue to NW 2nd Street through Ocala (1.6 miles)

Figure 4 shows a typical section of a four-lane facility divided by a median. *Figure 5* shows the six-lane facility with a center turn lane occurring along US 301 through Ocala. *Figure 6* shows a typical section of a two-lane non-divided facility.

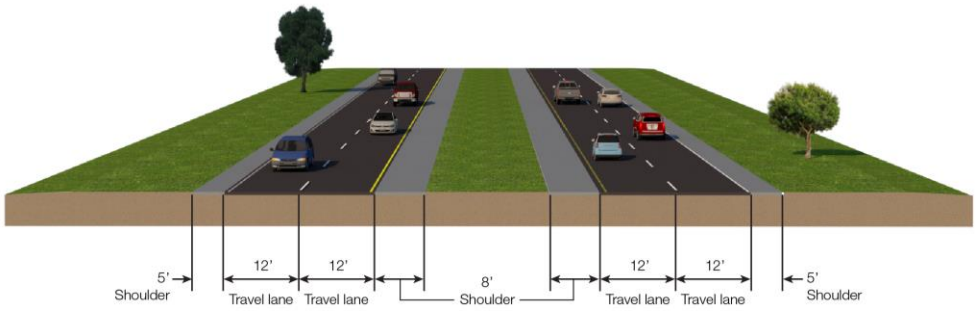


Figure 4. Typical Four-Lane Divided Roadway Section for Parallel Corridors

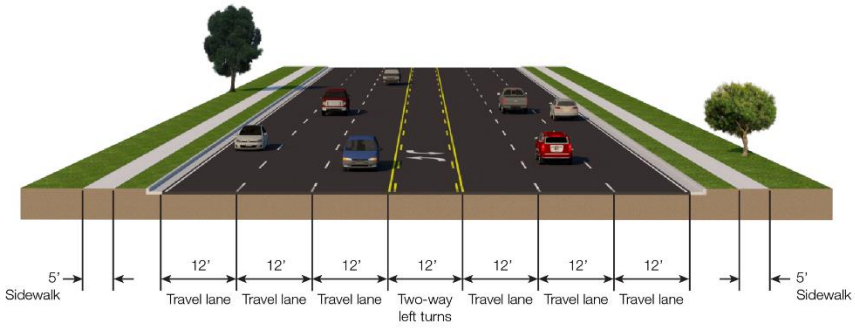


Figure 5. Typical Six-Lane with Center Turn Lane Roadway Section for Parallel Corridors

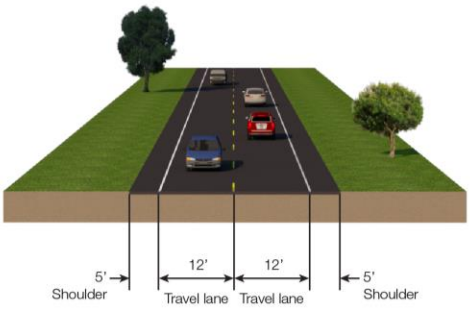


Figure 6. Typical Two-Lane Undivided Roadway Section for Parallel Corridors

3.2 Traffic Volumes

On a typical day, I-75 in Marion County has 81,000 vehicles which is around 3,600 vehicles per hour. By 2040, I-75 is projected to have 142,000 vehicles on a typical day. *Figure 7* shows a comparison of hourly traffic volumes along I-75 in Ocala and at the Florida-Georgia state line for September 6 to September 9 of the previous year 2016 (dark green) and for September 6 to September 9, 2017 (light green) during the evacuation. I-75 northbound in the Ocala area experienced an hourly traffic volume with a 1,236% increase over the same day the previous year and experienced pockets of severe congestion.

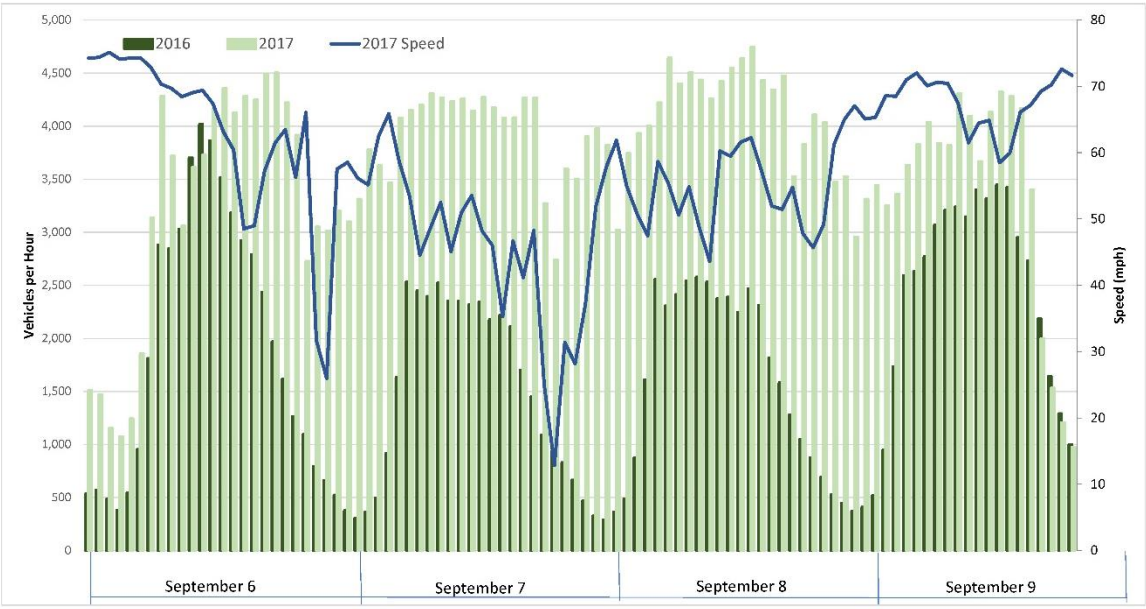


Figure 7. I-75 Northbound (Ocala) Hourly Traffic Volume Comparison of 2016 and 2017.

Similarly, US 19 northbound in the Crystal River and Chiefland areas had stop and go conditions on certain segments during the evacuation. US 19 in Chiefland experienced a 4,788% increase in hourly traffic volume over the same day the previous year as shown in *Figure 8*.

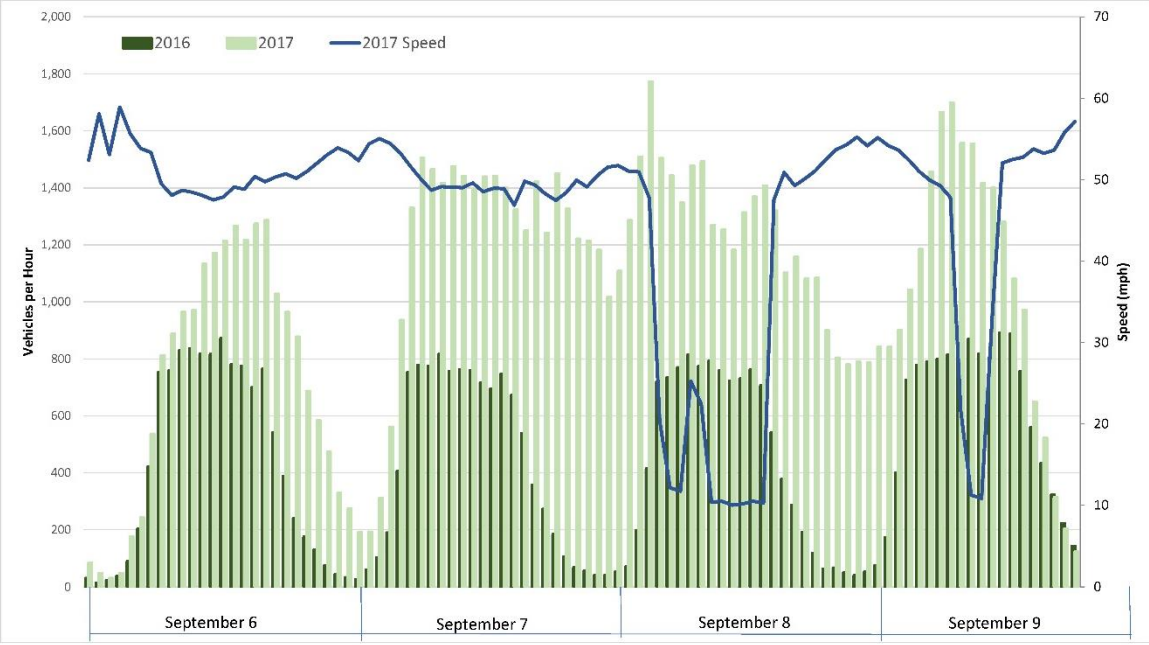


Figure 8. US 19 Northbound (Crystal River) Traffic Volumes Comparing 2016 with 2017

Alternatively, while still seeing significant increases in traffic over the same dates from the previous year, US 27 and US 301 still had room for more traffic during the evacuation, primarily due to a metering effect caused by cars stopping at the signals and queuing on the main road at gas station driveways.

See *Figure 9 and Figure 10*.

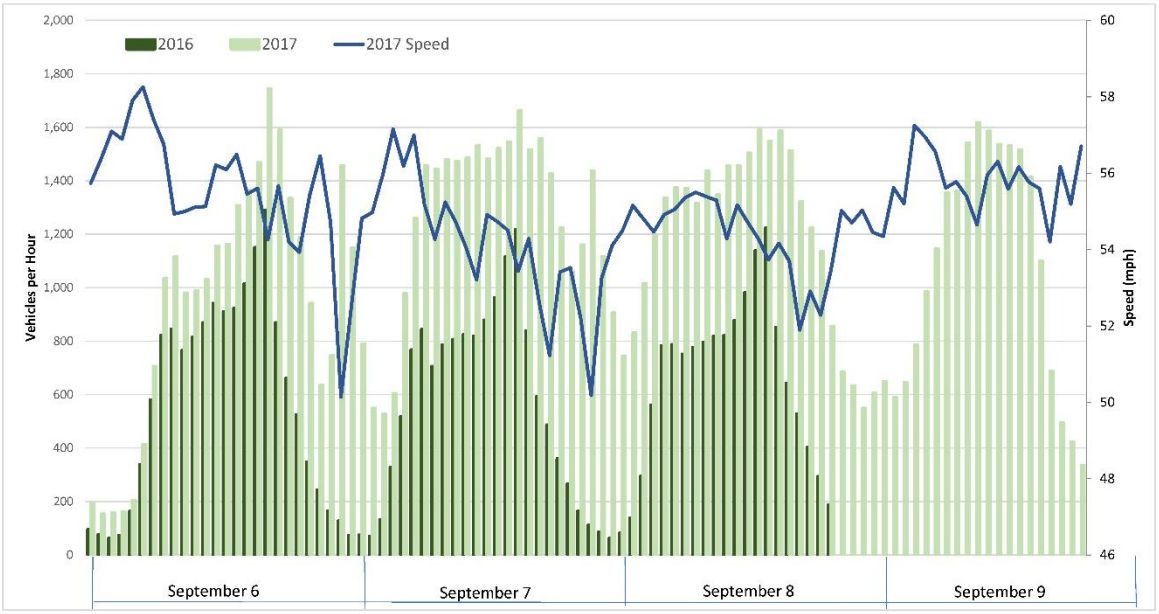


Figure 9. US 301 Northbound (Wildwood) Traffic Volumes Comparing 2016 with 2017

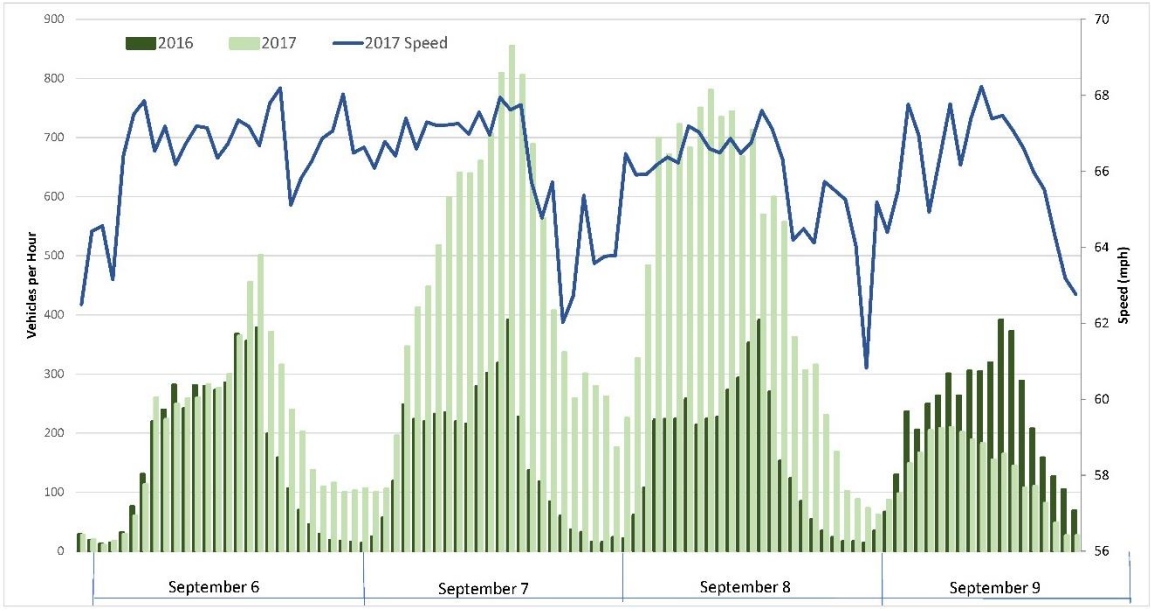


Figure 10. US 27 Westbound (Ocala) Traffic Volumes Comparing 2016 with 2017

3.3 Signalized Intersections

There are 37 signalized intersections along the US 98/US 19/US 27 corridor and the US 301 corridor has 31 signalized intersections as shown in *Figure 11*. Most of these signals are in the urban areas along the facility. The corridors do not have integrated signalized timing plans or the infrastructure necessary to remotely adjust the signal timing.

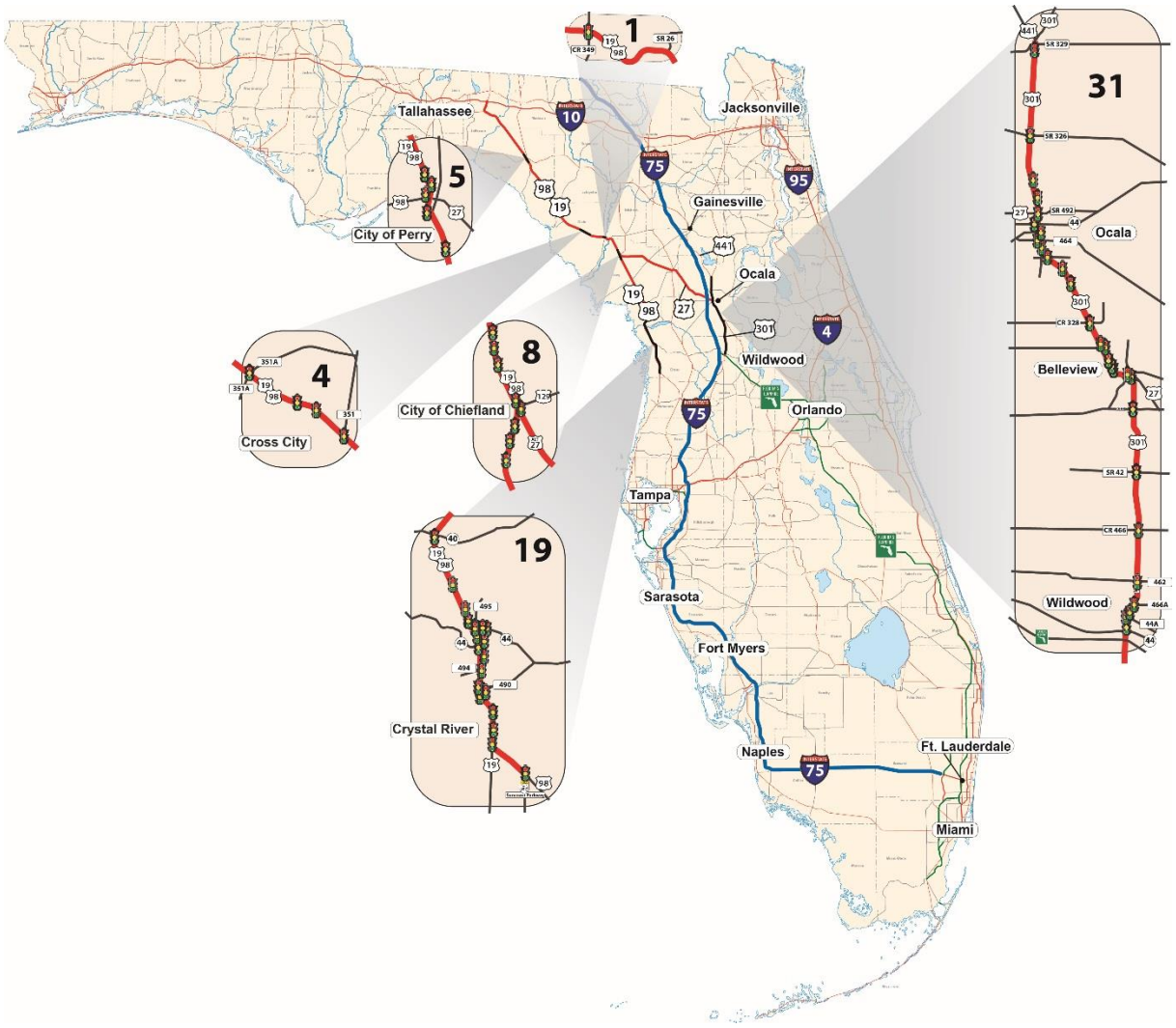


Figure 11. Alternative Corridor Signalized Intersections

3.4 Emergency Shoulder Use (ESU): Transition from One-Way (Contra-Flow) Operations

The previous plan for required large scale emergency evacuations was a one-way northbound operation of all lanes on the interstate. Although never implemented, the plan would have required maintenance crews to provide traffic cones, barriers, signs, and arrow boards to alert the motorists of the closure and operations. Once in operation, there would have been no allowance for pre-staging of first responder's assets. The operation would have:

- Been limited to day-light hours only, used wrong-way driving;
- Had fixed predefined entrance and exit points;
- Impeded incident management response; and
- Slowed the mobility of resources (fuel, water, food, necessities) for evacuation, preparation, and recovery in the projected impact region.

This plan also would have required law enforcement officers to keep motorists from traveling in the southbound direction during one-way operation. All major arterials with ramps entering the interstate in the southbound direction would have to be closed with law enforcement officers staged at each closure.

After the 2016 Hurricane Season, the Department evaluated use of shoulders on interstates in the event of an evacuation. Interstate shoulders on I-10, I-4, I-75, and the Turnpike Mainline were evaluated to determine the feasibility of ESU.

Computer simulation modeling was performed and ESU had comparable results with one-way (contraflow) operations. ESU was shown to provide many benefits including:

- Allowing fuel delivery to evacuation areas in the opposite direction of the evacuation,
- Resource staging for quick post storm recovery
- Adjustable entrance and exit points based on observed congestion
- Less law enforcement and maintenance personnel
- Effective movement of law enforcement and response vehicles in both directions
- Interchanges remain open and operational
- Start ESU implementation sooner and operates continuously (24-hour).

Emergency shoulder use was deemed feasible on I-4, I-75, and the eastern portion of I-10, and operation plans were developed.

4.0 HURRICANE IRMA EMERGENCY SHOULDER USE (ESU)

A state of emergency for all 67 counties in Florida was declared by Governor Scott on September 4, 2017 to ensure ample time, resources, and preparatory actions for Florida's residents and visitors to safely evacuate from harm's way. On September 8, 2017, a mandatory evacuation was called by Miami-Dade County, Broward County and Monroe County in advance of Hurricane Irma. Tolls were suspended throughout the State to support evacuation orders (see ***Appendix B*** for the associated news release). Due to anticipated increased volumes of motorists ESU was implemented as follows:

- I-75 northbound from Wildwood to CR 136 north of I-10 on September 7, 2017 at approximately 8:00 pm.
- I-75 northbound extended north to the Florida-Georgia state line on September 8, 2017 at approximately 8:00 am
- I-75 northbound extended south of Wildwood about 2 miles on September 8, 2017, at approximately 1:00 pm
- I-75 northbound was terminated on September 9, 2017 at approximately 11:00 am
- I-4 eastbound was implemented from 50th Street in Tampa to the Western Beltway (SR 429) in Orlando on September 9, 2017 at approximately 3:00 pm

- I-4 eastbound was extended east to Central Florida Greenway (SR 417) on September 9, 2017 at approximately 4:00 pm after observing drivers were continuing to use the shoulder
- I-4 eastbound was terminated on September 9, 2017 at approximately 8:00 pm.

During the implemented ESU operations, hurricane response and recovery support, including out-of-state resources, could travel in the opposite direction of the evacuating traffic to pre-position their assets. Transportation Management Center (TMC) staff and State Emergency Operations Center (SEOC) staff (the Department and FHP) continuously monitored traffic conditions using available traffic cameras and vehicle counters. Real-time monitoring allowed the TMC operators to dispatch emergency response vehicles to clear stranded or disabled motorists. During the I-75 ESU operation, eighteen (18) Emergency Roadside Assistance Vehicles (Road Ranger Service Patrols) assisted 506 motorists. During the I-4 ESU operation six (6) Emergency Roadside Assistance Vehicles (Road Rangers) assisted 26 motorists.

Post storm, the I-75 bridge over the Santa Fe River was threatened with potential flooding. Detour Plans were developed and Florida Department of Transportation (FDOT), Georgia Department of Transportation (GDOT), and Florida Highway Patrol (FHP) resources were on standby to close I-75 and implement detours if the river impacted the bridge. This required an extensive amount of rapid coordination between FDOT, FHP, emergency responders, local law enforcement, and GDOT. The Santa Fe River did not impact the I-75 bridge. However, it did flood US 441 in Payne's Prairie, US 41, US 27, and SR 47. As of January 30, US 441 still has one lane closed in each direction. See ***Appendix C*** for the associated news releases and detour map.

Figure 12. Screenshots of Hurricane Irma Emergency Shoulder Use as Captured on ITS Cameras

The following charts show the increased traffic volumes and speeds during the implementation of I-75 ESU.

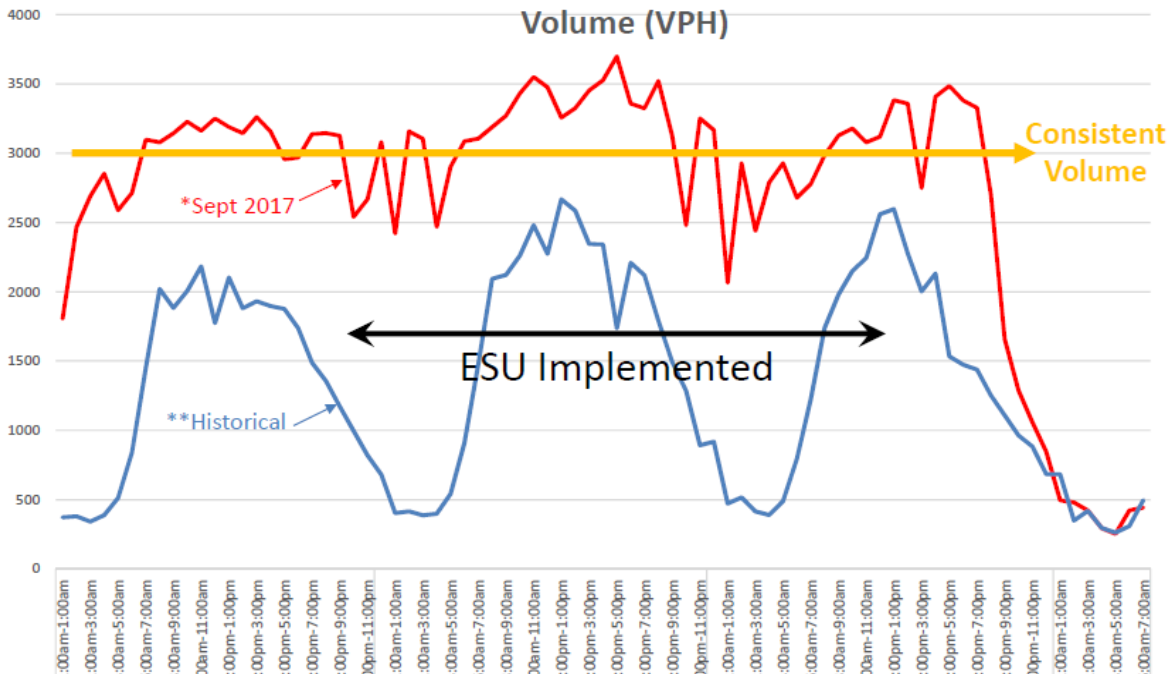
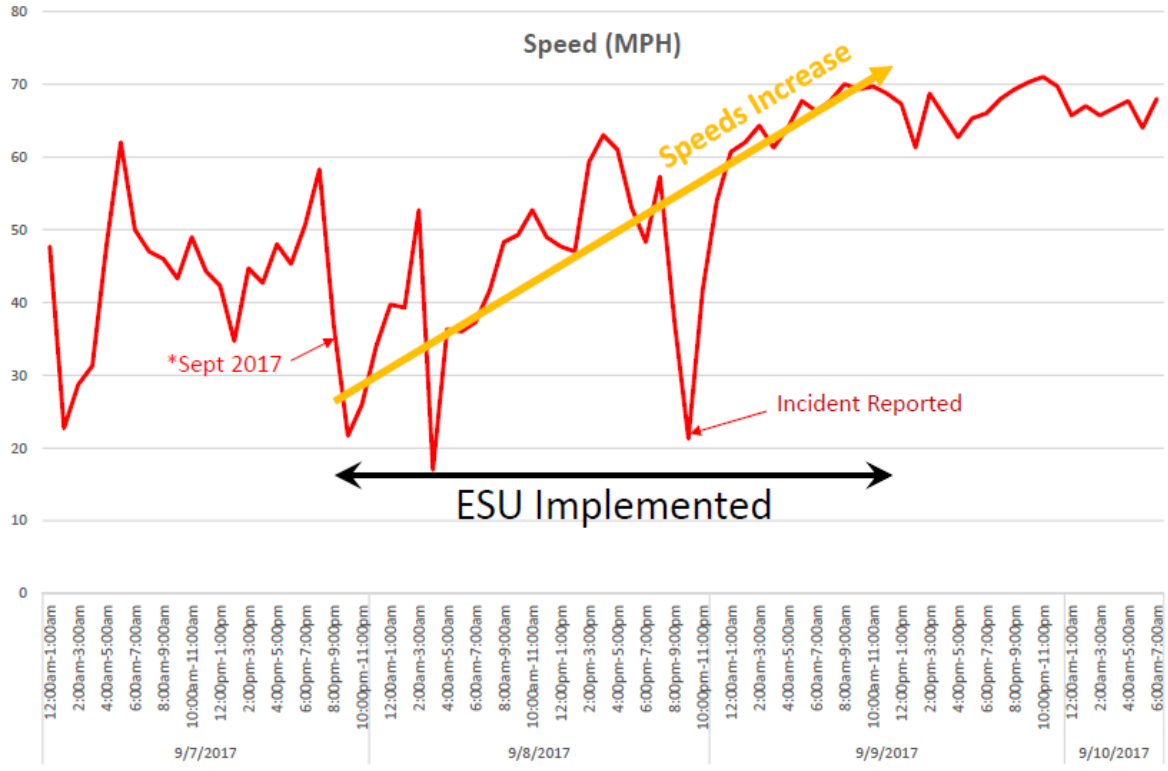


Figure 13. ESU Traffic Volumes during Hurricane Irma Emergency Evacuation

* Sept 2017: Detector MVDS I-75 at MM342.6 NS and Detector MVDS I-75 at MM348.7 in Marion County
** Historical: I-75 S. Marion County (MM 342.6) MVDS
Note: Shoulder volume is not included in the chart as MVDS is not configured to collect shoulder data



* Sept 2017: Detector MVDS I-75 at MM342.6 NS and Detector MVDS I-75 at MM348.7 in Marion County

Note: Shoulder speed is not included in the chart as MVDS is not configured to collect shoulder data

Figure 14. ESU Traffic Speed during Hurricane Irma Emergency Evacuation

4.1 Other Interstates and Parallel Corridors

I-10 was not activated for ESU, however illegal use of the shoulder was observed along I-10 west of the of the I-75/I-10 interchange. Congestion was observed at signalized intersections and driveway access to gas stations along the US 301/US 441 and the US 19/US 98/US 27 corridors. Based on observations, I-95 appeared to experience less than typical interstate speeds with some congestion at the interchange of I-95 and I-4.

4.2 Public Information for Emergency Shoulder Use (ESU)

The Department utilized multiple communication platforms to promote ESU during the evacuation. This included Florida 511, which is the Department's official website/mobile application for real-time traffic information. During the evacuation on the morning of September 9, the Florida 511 web site (www.fl511.com) set a record with 28,441 concurrent users.

The Department posted the message for ESU on Dynamic Message Signs (DMS) and coordinated with Google and Waze to communicate the option of ESU within their mobile applications. News releases were distributed to applicable media as well as social media alerts via the Governor's, FDEM's, and Department's Twitter and Facebook pages. See ***Appendix D*** for the I-75 and I-4 ESU news releases.

4.3 Lessons Learned

With an estimated 6.8 million people ordered to evacuate, both the I-75 and I-4 ESU operations helped emergency evacuees get to safety well in advance of tropical force winds arriving, while still allowing emergency responders to travel in the opposite direction. Although minor collisions involving rear-end and side swipe crashes did occur, there were no fatalities. The ESU operation was implemented without a major disruption to traffic flow and interchanges remained open for drivers to access food and fuel. The reduced number of law enforcement personnel required to support ESU allowed for more law enforcement staff to focus on other storm preparation needs.

At the beginning of the implementation of I-75 ESU, managing driver behavior was challenging because it was difficult to get drivers to use the shoulder. After additional FHP direction and public messaging, the shoulder became well-utilized. Most drivers on I-75 complied with the end of ESU message on the Portable Message Signs (PMS). However, on I-4, some drivers continued to use the shoulder past the end ESU signs and additional troopers were staged at the terminus to alert drivers the ESU operations were ending.

An "accordion effect" was observed with heavy congestion followed by pockets of free flow conditions on both I-75 and I-4 during the ESU operation. There was also observed congestion at the Florida-Georgia state line due to the termination of ESU. On I-75, while all roadway construction activities were suspended prior to evacuation orders, a major construction project south of the I-75/Turnpike interchange caused shoulder closures along the evacuation route. Congestion was also observed at the I-75/Turnpike interchange extending to the exit to SR 44 in Wildwood.

At the request of FHP, the Turnpike implemented signage for the following alternative route from the Turnpike Mainline northbound to I-75 northbound:

- The Turnpike Mainline exit at US 301 for 13 miles north
- 132nd Street for 1 mile west, from US 301 to SR 484
- SR 484 west for 6 miles to I-75.

The use of additional emergency roadside services (Road Ranger service patrols [RRSP] and wrecker services) on I-75 and I-4 was instrumental in successful implementation and management of ESU. Roadside traffic cameras provided live views of roadway conditions that allowed TMC operators to immediately dispatch responders to aid stranded motorists. The cameras also allowed the State Emergency Operations Center visibility of the roadways to support public messaging.

5.0 PLANNED IMPROVEMENTS

The interchange of I-75 and the Turnpike Mainline in Wildwood will still be under construction at the start of the 2018 hurricane season. Once construction is complete in summer of 2019, the improved interchange will address weaving movements by providing new braided ramps for the I-75 northbound to SR 44 exit and the southbound I-75 to the Turnpike Mainline southbound entrance. The new braided ramp carrying northbound traffic from I-75 to the SR 44 exit reduces the "weave" or lane changes between the interstate and the Turnpike Mainline traffic, and is scheduled to be open to traffic in summer of 2019. Also, there will be two auxiliary lanes added to the Turnpike Mainline northbound movement where it merges with I-75 northbound traffic. The auxiliary lanes will end just south of the I-75/SR 44 interchange. North of the interchange, two auxiliary lanes will carry traffic coming on I-75 from SR 44 and transition back to three through lanes on northbound I-75.

Figures 15 and *16* illustrate the existing interchange configuration versus the interchange configuration once construction is complete. *Figure 17* illustrates the number of future lanes after construction is finished.

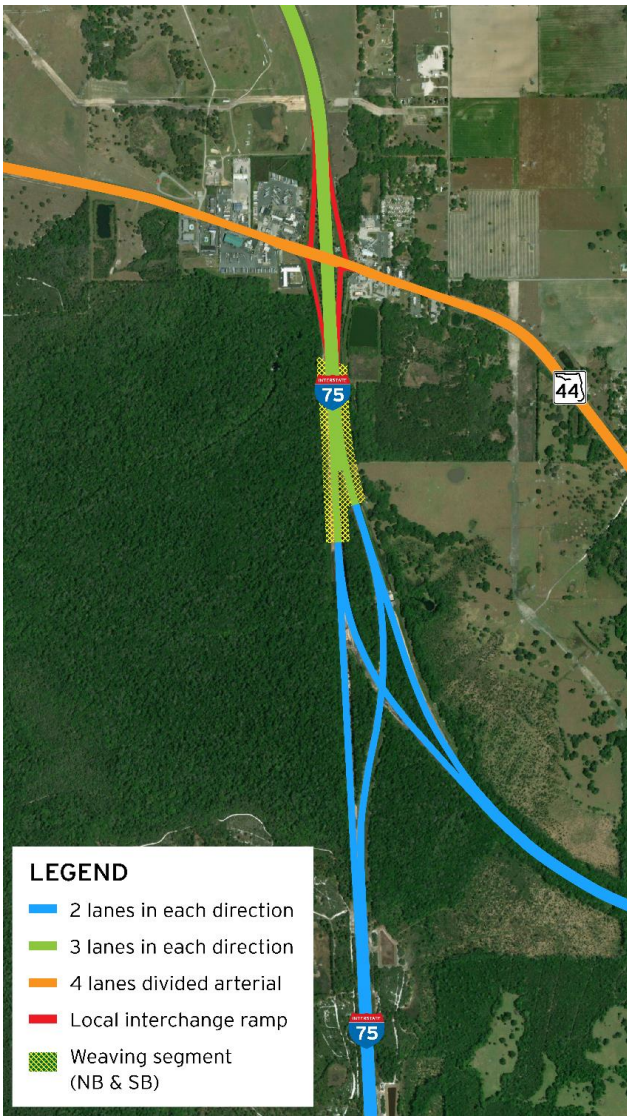


Figure 15. Existing I-75/Turnpike Interchange

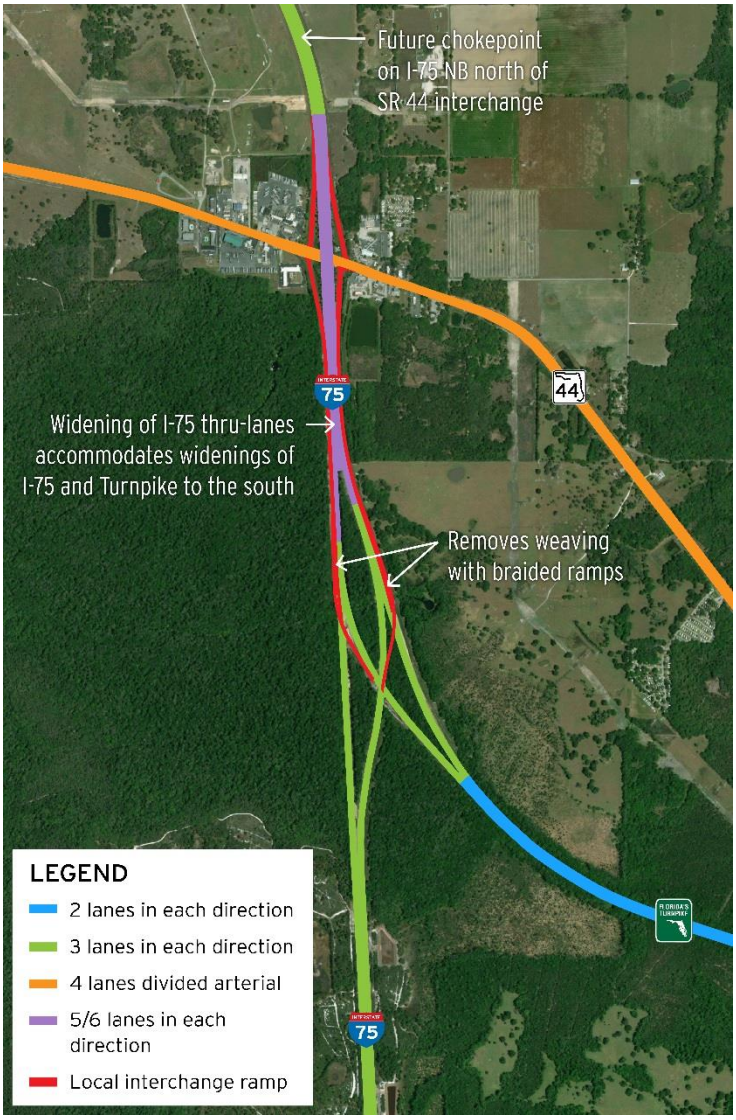


Figure 16. Future I-75/Turnpike Interchange.

Figure 17. Travel Lanes through the I-75/Turnpike Interchange

The Turnpike Mainline section feeding in to the I-75/Turnpike interchange is currently four lanes. There is construction scheduled to widen to six lanes from the Lake/Sumter county line to CR 468 interchange in 2023 and from CR 468 interchange to I-75 in 2025.

Additional lanes are needed by year 2025 for I-75 northbound north of SR 44. A study is programmed in fiscal year 2020 to look at I-75 from I-75/Turnpike interchange north through the city of Gainesville. This study will determine the ultimate typical section for I-75 and identify the number of additional lanes needed to accommodate future traffic demand.

Road Ranger service patrol (RRSP) coverage can be extended along I-75 from the Turnpike Mainline to north of Gainesville. Consideration would be given to providing separate contracts for additional RRSPs during an emergency evacuation and re-entry with their own dedicated fuel supply.

There are segments of the interstate evacuation routes within the study area of this report under construction to install roadside devices such as cameras and DMS for monitoring traffic conditions and communicating information to the public. Emergency management trailers equipped with portable communications tools will be used until the following segments come online:

- I-75 cameras and DMS from Gainesville to the Georgia state line. Scheduled for completion in May 2018.
- I-95 cameras and DMS from north of Jacksonville to the Georgia state line. This project is scheduled for completion in November 2018.
- Cameras and DMS as part of the I-75/Turnpike interchange construction project are scheduled to be installed and operational November 2018.
- I-10 cameras and DMS from Tallahassee to Jacksonville. This project is scheduled to be complete by March 2019.

These segments are shown in *Figure 18*:

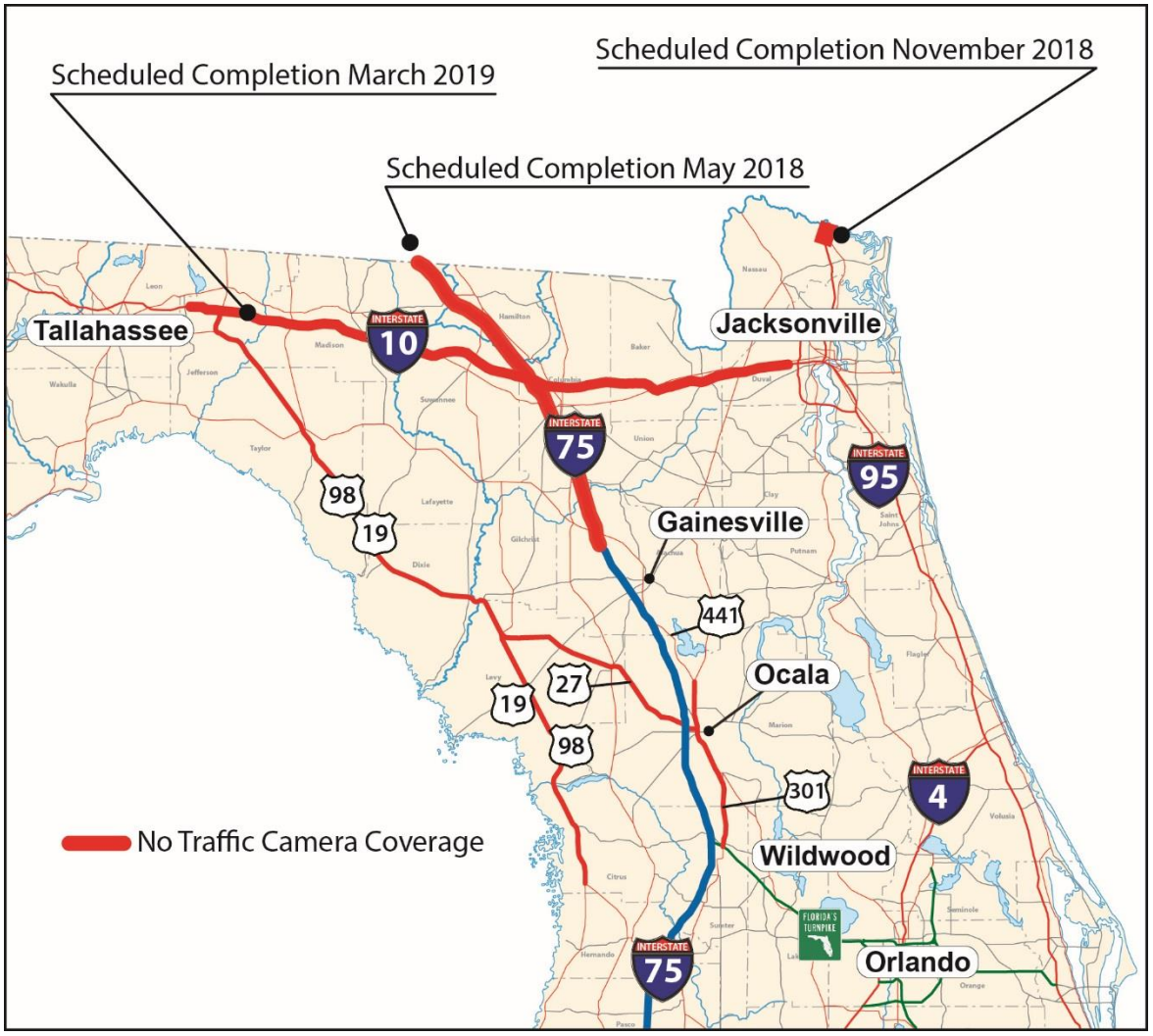


Figure 18. Construction along the Interstate to install Cameras and DMS

Sections of I-75 in Manatee, Hillsborough, Pasco, Hernando, and Sumter counties as well as sections of I-95 in Palm Beach, Martin, Indian River, and Volusia counties have gaps in camera coverage. The Department is currently investigating opportunities to provide full corridor camera coverage as stand-alone projects or combined with other construction projects.

Deployment of additional DMS prior to interstate exits for alternate route messaging can provide increased efficiency in evacuation scenarios. The Department could develop standard messaging for the DMS to provide motorists messages on hurricane warnings, alternate routes, the availability of shelters, and other emergency services. Finally, to assist during emergencies with dynamic hurricane paths, such as those taken by Irma, the Department could consider adding remote communication to portable changeable message signs (PCMS) to provide additional flexibility in where messages can be displayed and allows messages to be updated remotely.

The Truck Parking Availability System (TPAS) is an ITS subsystem that will provide real-time parking information to commercial vehicle operators at all rest areas, weigh stations and welcome centers. The system includes camera coverage of the truck parking areas which could be utilized during emergency evacuation for monitoring of the facility. The system also includes roadside signs which display the available parking for commercial vehicles. The system will be complete along portions of I-95 prior to the 2018 hurricane season. The Department is also in the process of interconnecting the interstate weigh stations on a fiber optic network to increase the efficiency of truck freight movement. This interconnectivity can be leveraged to facilitate efficiency during emergency response, including fuel distribution and utility staging at the weigh stations.

6.0 NEXT STEPS

6.1 Public Information Dissemination Enhancements

Public information and information dissemination are critical components to a safe and efficient evacuation. The Department's Florida 511 website was extensively used during the evacuation. However, the website system was only designed for 25,000 concurrent users, and while the system stayed operational, performance was slow. The Department is prepared to research options to enhance the system design to accommodate higher concurrent user sessions. In addition, the Department is already enhancing its partnerships with Google and Waze.

The Department will continue to provide public outreach and information describing the benefits of ESU for Florida during an emergency evacuation. Providing outreach and messaging for open and available shelters is also necessary. While the Department utilized the American Red Cross system during the Hurricane Irma evacuation, opportunities to use DMS and PCMS for additional shelter messaging will be investigated. A communication plan on evacuations and shelters could also be developed in coordination with Florida Division of Emergency Management (FDEM).

6.2 Expansion of Emergency Shoulder Use (ESU)

In preparation for the 2018 hurricane season, the Department is ready to analyze the feasibility of ESU expansion. Interstate facilities with three or more travel lanes in each direction could be investigated for feasibility of inside shoulder use, because the width is typically designed for ten-feet (*Figure 3*). Further, interstate facilities with two travel lanes in each direction could be investigated for feasibility of outside shoulder use, because the inside shoulder is not wide enough to support vehicular travel (*Figure 19*). In general, it is preferable to use the inside shoulder for emergency use, to avoid conflicts with interchange entrance and exit ramps, rest areas and weigh stations.

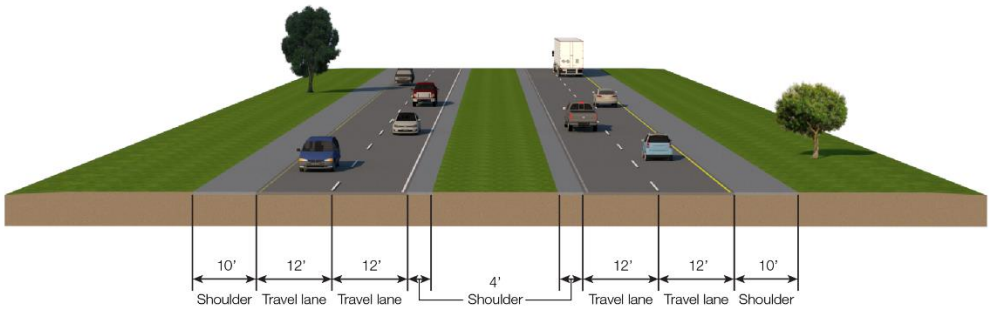


Figure 19. Four-Lane Interstate Typical Section.

Based on the detailed analysis, additional ESU plans could be developed and completed prior to the 2018 hurricane season for the following corridors:

- I-75 northbound from Fort Lauderdale to the Florida-Georgia state line, inside shoulder
- I-75 southbound from Georgia state line to Alligator Alley, inside shoulder
- Turnpike Mainline from Orlando to I-75, outside shoulder
- I-95 NB from north of Palm Beach to the Florida-Georgia state line, inside shoulder
- I-10 from Jacksonville to east of Tallahassee, outside shoulder

ESU feasibility could also be evaluated on the Turnpike Mainline from Fort Pierce to Orlando.

Additional coordination with GDOT regarding the transition of ESU on I-75 in South Georgia could be held to avoid back-ups into Florida, before the start of the 2018 Hurricane Season.

It was determined that I-10 from east of Tallahassee to the Florida/Alabama state line is not feasible. Due to the rolling terrain associated with the Florida panhandle, this roadway section has a concrete gutter along the outside edge of the shoulder to capture storm water from the roadway and prevent erosion. This shoulder gutter narrows the usable shoulder width, preventing ESU.

6.3 Parallel Corridors

The Department is prepared to deploy on I-75 “Florida’s Regional Advanced Mobility Elements” (FRAME) projects to test emerging connected and automated vehicle technologies. The FRAME projects would evaluate how to better manage, operate and maintain the transportation system using roadside units along I-75 and adaptive signal control technologies along US 301 in Ocala and US 441 in Gainesville. These technologies would be available for use in disseminating real-time information to motorists in the event of an emergency evacuation.

The Department is prepared to study the feasibility of using US 301 as an alternate route to decrease traffic demand at the I-75/Turnpike interchange. This may involve a longer term need to widen the 2.5-mile two-lane section of US 301 or construct bypass routes. In the interim, the Department will could also research the feasibility of deploying one-way northbound operation of the 2 lane US 301 section during emergency evacuation, requiring close coordination with the Florida Highway Patrol and the Marion County Sheriff’s Office.

To maximize the capacity of the parallel corridors, signal timing for increased northbound throughput of traffic is necessary. The Department is prepared to examine the traffic signal equipment and emergency generator inventory and could procure additional inventory as needed. The Department could also research the feasibility of a pre-event contract for modifying signal timing at signalized intersections along the US 98/US 19/US 27 corridor from the Suncoast Parkway to I-10 and the US 301 corridor from the Turnpike Mainline to Ocala in the event an emergency evacuation is initiated.

Currently no ITS installations along the US 98/US 19/US 27 corridor exist. The Suncoast Parkway has ITS camera coverage until its terminus with US 98 in Citrus county. The Department could also consider installation of roadside devices to monitor traffic at key points along the alternate US 19/98/27 route. The Department is also prepared to investigate the feasibility of deploying a fiber optic communications network along the corridor which could be expanded to include signal timing, camera, and DMS coverage for both daily use as well as emergency evacuation.

7.0 SUMMARY

By the start of the 2018 hurricane season (June 1, 2018) the Department recommends and is prepared to do the following under the Governor's direction:

- Expand Road Ranger service patrol (RRSP) coverage along I-75 from the Turnpike Mainline to north of Gainesville.
- Install cameras and DMS on I-75 from Ocala to the Georgia state line.
- Identify additional methods to enhance the dissemination of information and coordinate with partners to develop a public information plan on ESU.
- Develop ESU plans for the following additional corridors determined feasible:
    - I-75 northbound from the beginning of Alligator Alley in Fort Lauderdale through Fort Myers to the Georgia State Line
    - Turnpike Mainline from Orlando to I-75
    - I-95 northbound from north of Palm Beach to the Georgia state line
    - I-10 from westbound from I-75 to US 221 east of Tallahassee
- Evaluate ESU feasibility for Turnpike Mainline from Fort Pierce to Orlando
- Coordinate with the GDOT regarding the transition of ESU on I-75 in South Georgia to avoid back-ups into Florida.
- Develop plans to modify the signal timing for the US 98/US 19/US 27 and US 301 corridors as feasible.
- Develop a pre-event contract for the US 98/US 19/US 27 corridor to I-10 and the US 301 corridor from the Turnpike Mainline to Ocala for modifying the signal timing to expedite the movement of northbound traffic.
- Begin examining options for additional traffic monitoring devices for the US 98/US 19/US 27 corridor

If directed to, the Department is committed to developing these strategies to transform and modernize the state's road evacuation plans for our state's residents and visitors.

APPENDIX

APPENDIX A

FOR IMMEDIATE RELEASE
October 12, 2017

CONTACT: GOVERNOR'S PRESS OFFICE
(850)717-9282
media@eog.myflorida.com

Gov. Scott Directs FDOT to Examine Interstate Improvements From I-75/Florida Turnpike Interchange to Florida-Georgia Border

TALLAHASSEE, Fla. – Today, Governor Rick Scott directed the Florida Department of Transportation (FDOT) to begin examining ways to help expedite evacuation routes from the I-75/ Florida Turnpike Interchange near Wildwood to the Florida-Georgia border during times of emergencies such as hurricanes. FDOT's report will be submitted in January 2018.

Governor Scott said, "In preparation for Hurricane Irma, the state worked closely with local emergency management, transportation and law enforcement partners to successfully oversee the largest evacuation in U.S. history. Anytime a natural disaster threatens our state, we must do all we can to ensure Floridians can evacuate safely. That is why today, I am directing FDOT and their traffic experts to begin a comprehensive evaluation on ways to help expedite evacuation routes on I-75 from Wildwood to the Florida-Georgia border. This roadway is a major evacuation route, and it is crucial that residents and visitors can quickly and safely travel in this area during emergencies. We will continue to work with all our partners to make sure we are doing everything we can to ensure our state is fully prepared for all emergencies so we can keep our families and visitors safe."

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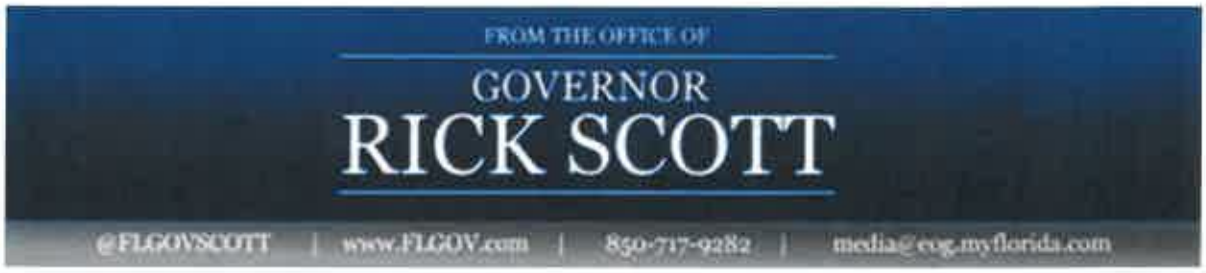
APPENDIX B



FOR IMMEDIATE RELEASE
September 5, 2017

CONTACT: GOVERNOR'S PRESS OFFICE

(850) 717-9282
media@eog.myflorida.com

Gov. Scott Directing the Suspension of all Tolls Across Florida

TAMPA, Fla. – Today, Governor Rick Scott directed the Florida Department of Transportation (FDOT) to suspend tolls across the entire State of Florida in preparation for Hurricane Irma. By suspending all tolls, Floridians and visitors will more easily be able to prepare for any potential storm impacts, access important hurricane supplies, and quickly and safely evacuate when necessary.

Governor Scott said, "In preparation for the potential impacts of Hurricane Irma, I have directed the Florida Department of Transportation to suspend all tolls across the State of Florida to keep traffic flowing. They will be suspended for the duration of the storm's impacts to Florida. Ensuring the safety of Florida families and visitors is our top priority and suspending tolls statewide will help people quickly evacuate and make it easier for all Floridians to access important hurricane supplies to ensure they are fully prepared. FDOT has been in constant contact with local districts and stands ready to provide traffic assistance alongside the Florida Highway Patrol and their law enforcement partners. We are continuing to closely monitor the developments of Hurricane Irma and will continue to take aggressive action to keep our state safe."

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APPENDIX C

September 12, 2017

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FDOT and FLHSMV Monitoring Santa Fe River at I-75 for Potential Impacts Due to Unprecedented Flooding

TALLAHASSEE, Fla. – Upon receiving weather reports late today, the Florida Department of Transportation (FDOT) announced that it is actively monitoring a small bridge on I-75 at mile marker 408 crossing the Santa Fe River on the northern border of Alachua County. The river is expected to crest at historic and unprecedented levels presenting a potential threat to the safety of travel on this bridge. The Santa Fe River under I-75 has rapidly risen 15 feet within the past 36 hours due to the heavy rainfall over North Florida from Hurricane Irma. An additional rise is expected within the coming days as water levels from upstream move southward down the river. The river level is currently safe at 55 feet. However, if the river were to rise to an unsafe level, the bridge would become impassable both northbound and southbound, and would be closed immediately.

At this time, I-75 remains safe and passable. Floridians that are traveling home should monitor this situation very closely and remain alert to local travel conditions. The Florida Department of Transportation is actively working with WAZE, Google Maps, the Georgia Department of Transportation and other transportation industry partners to communicate the potential reroutes to the public. Floridians should consult www.FL511.com for up-to-date information on road closures and travel routes.

Hydrologists from the United States Geological Survey (USGS) will be conducting an on-site assessment of river conditions tomorrow morning. An update on the conditions will be provided following this assessment. FDOT bridge inspectors are monitoring this structure 24 hours a day to ensure driver safety.

If the Santa Fe River rises to an unsafe level, it will require the full closure of I-75 south of I-10 and north of U.S. 441 in Alachua. Travelers should be prepared for significant delays from tomorrow evening through Saturday. This unprecedented river flooding will also cause closures and extensive rerouting of traffic on U.S. 27, U.S. 41, S.R. 47 and possibly U.S. 121. These routes would not be considered passable.

In the event of road flooding on I-75 at the Santa Fe River, FDOT will reroute traffic to U.S. 19, U.S. 301 and I-95. **Any Floridian planning on traveling to Central or Southern Florida should consider traveling southbound on I-95**.

To plan for the possibility of bridge damage, FDOT will be issuing an emergency procurement to ensure a team of engineers will be on scene to immediately make any needed repairs once the water recedes.

We will keep the public and media informed of any developments. Safety is always our top priority and additional updates will be released as soon as available.

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September 13, 2017

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I-75 Santa Fe River Detour

TALLAHASSEE, Fla. – The Santa Fe River under I-75 has rapidly risen 15 feet within the past 36 hours due to the heavy rainfall over North Florida from Hurricane Irma. In the event that I-75 closes, please see the attached detour map.

Additional bridges that may be impacted include: U.S. 27, U.S. 41, S.R. 47 and possibly U.S. 121. Additional maps and detour information will be forthcoming.

FDOT and FLHSMV have staff monitoring the bridges that may be impacted by the flooding 24/7.

If the river rises to an unsafe level, the bridge will be impassable both northbound and southbound, and would be closed immediately. **Floridians that are traveling should avoid the area if possible.**

If required to be in the area, the Florida Department of Transportation is actively working with WAZE, Google Maps, the Georgia Department of Transportation and other transportation industry partners to communicate the potential reroutes to the public. Floridians should consult www.FL511.com for up-to-date information on road closures and travel routes.

En Español

El Rio Santa Fe debajo de I-75 ha subido 15 pies rápidamente entre los últimos 36 horas por lluvias fuertes sobre la norte de Florida por Huracán Irma. Si I-75 se cierra, por favor mira la mapa de desvió adjunto.

Puentes adicionales que podrían ser impactadas incluyen: U.S. 27, U.S, 41 y posiblemente U.S. 121. Mapas adicionales y información de desvió estará disponible.

FDOT y FLHSMV tienen personal monitorizando 24/7 los puentes que pueden ser afectados por inundación.

Si el rio se sube a un nivel inseguro, el puente será infranqueable por ambos direcciones norte y al sur, y seran cerradas imediatamente. Floridanos viajando deben evitar la área si es posible.

Si es requerido estar en la área, el Departamento de Transportación de la Florida está trabajando activamente con WAZE, Google Maps, el Departamento de Transportación de Georgia y otros asociados en la industria de transportación para comunicar las rutas potenciales al público. Floridanos deben consultar www.FL511.com para información al día de cierres de carreteras y rutas de viaje.

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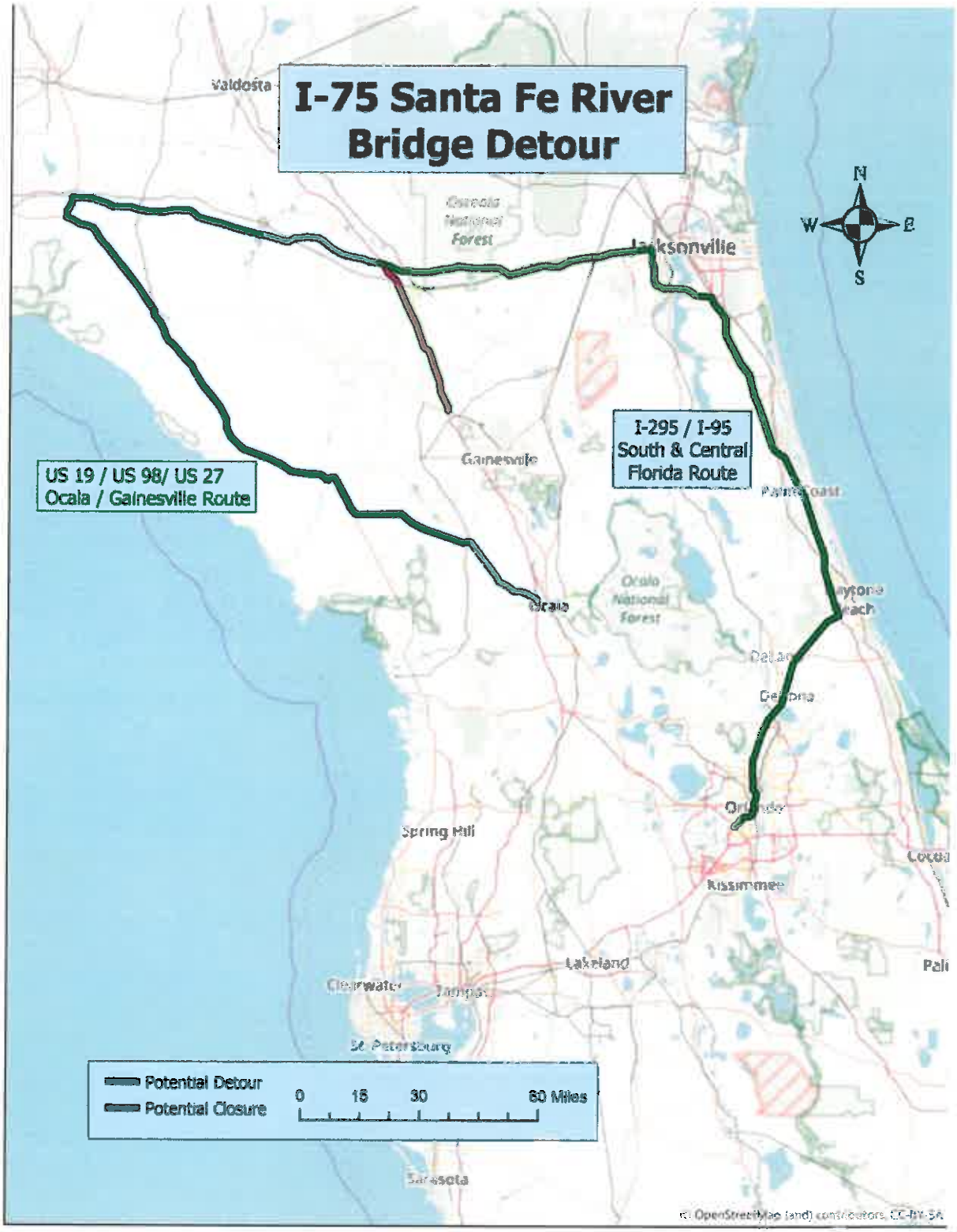
I-75 Santa Fe River Bridge Detour
Valdosta
Osceola National Forest
Jacksonville
N
W
E
S
I-295 / I-95 South & Central Florida Route
US 19 / US 98/ US 27 Ocala / Gainesville Route
Gainesville
Palm Coast
Ocala
Ocala National Forest
Daytona Beach
DeLand
Deltona
Orlando
Spring Hill
Kissimmee
Cocoa
Lakeland
Clearwater
Tampa
St. Petersburg
Sarasota
Potential Detour
Potential Closure
0
15
30
60 Miles
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September 14, 2017

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I-75 will Remain Open

TALLAHASSEE, Fla. – Today, the Florida Department of Transportation announced that I-75 will remain open, as flood waters have been receding on the Santa Fe River. As of this morning, FDOT engineers and state meteorologists do not believe that the Santa Fe River will reach a level to make the interstate unsafe.

On Wednesday, FDOT and the Department of Highway Safety and Motor Vehicles announced that due to unprecedented flooding of the Santa Fe River, there was a potential for I-75 to close for motorist safety.

Because of high water levels of the Santa Fe River, US 41 and US 27 remain closed. Once these highways are safe, they will be reopened to motorists.

FDOT and the DHSMV will continue to keep Floridians and visitors updated on traffic conditions by constantly updating FL511.com. You can also follow @MyFDOT, @FLHSMV, @FL511, and @FLGovScott.

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APPENDIX D

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.

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.**