

## 1. INTRODUCTION

The interchange of Interstate 10 (I-10) with State Road 51 (US 129) is located in Suwannee County, Florida. The interchange provides primary access for the City of Live Oak, located to the south of this interchange. The Florida Department of Transportation (FDOT) District Two is conducting an interchange study to evaluate improvements for the interchange of I-10 and SR 51 (US 129). This Interchange Operational Analysis Report (IOAR) evaluated alternatives to improve traffic operations and safety at this critical interchange in Suwannee County. The existing I-10 and SR 51 (US 129) interchange is an unsignalized diamond interchange configuration. SR 51 (US 129) is functionally classified as a four-lane Rural Minor Arterial and I-10 is functionally classified as a Rural Principal Arterial Interstate. The context classifications are as follows: SR 51 (US 129) is classified as a C3C-Suburban Commercial Facility south of I-10 and C2-Rural Facility north of I-10.

### 1.1 Background

The interchange of I-10 at SR 51 (US 129) is an important component of the State's Strategic Intermodal System (SIS) and provides access to the City of Live Oak. This IOAR proposes Ultimate Improvements to enhance the movement of people and goods at this Interchange. SR 51 is currently a divided four-lane roadway north and south of I-10 transitioning to an undivided two-lane roadway approximately a half mile north of the interchange. I-10 is currently a divided four-lane roadway within the project limits.

The project is included in the State Transportation Improvement Program (STIP) and FDOT's 5-year Work Program.

This IOAR is seeking approval from FDOT's Chief Engineer and FDOT Central Office for the proposed improvements to the access point of I-10 at SR 51 (US 129) in Suwannee County. This IOAR has been developed in accordance with FDOT Policy No. 000-525-015: Approval of New or Modified Access to Limited Access Highways on the Strategic Highway System (SHS), FDOT Procedure No. 525-030-160: New or Modified Interchanges, 2020 Interchange Access Request User's Guide (IARUG), 2020 IARUG Safety Analysis Guidance, and the 2019 FDOT Traffic Forecasting Handbook (Procedure No. 525-030-120).

### 1.2 Purpose and Need

The purpose of this study is to improve interchange operations, reduce congestion, improve safety, and alleviate spillback onto I-10 during hurricane evacuation at this interchange location. Improvements are aimed at increasing the efficiency of the I-10 at SR 51 (US 129) interchange and SR 51 (US 129) arterial corridor.

The primary need of the project is to improve existing and future traffic operations thereby improving safety at the interchange. The interchange of I-10 at SR 51 (US 129) is a diamond interchange providing full access to SR 51 (US 129). It is an important component of the SIS providing access to the City of Live Oak. Currently, the westbound I-10 off-ramp and the eastbound I-10 off-ramp both terminate at stop-controlled intersections. During the Design Year (2045), this configuration does not provide efficient operations and results in traffic

backups, primarily at the off ramp left turns, during the AM and PM peak hours. Additionally, the ramp terminals experience crash rates higher than the statewide averages.

The available crash data collected from the FDOT Crash Analysis Reporting On-line (CAR On-line) for the years 2014 through 2018 reveal that a total of 118 crashes occurred in the project area, of which 36 (31%) were angle crashes and 23 (19%) were front to rear crashes. Most of the crashes (73 or 62%) of the total crashes occurred on the project segment of SR 51 (US 129), resulting in 49 injuries and one fatality.

If no operational and safety improvements are made within the interchange area, conditions will become progressively worse as traffic volumes continue to increase, thereby, deteriorating this interchange access.

### 1.3 Project Location

The subject interchange is in Suwannee County, along I-10 at Milepost (MP) 14.565. The I-10 at SR 51 (US 129) interchange is located between the interchanges of I-10 at SR 10 (US 90) to the west (MP 6.465) and I-10 at CR 137 to the east (MP 23.865). The SR 51 (US 129) interchange is located approximately 8.1 miles to the east of the SR 10 interchange and approximately 9.3 miles to the west of the CR 137 interchange. The project location and the study area are shown in **Figure 1-1**. The adjacent interchanges are not included within the area of influence as they are more than 5 miles from the study interchange and will not be impacted.

### 1.4 Access for Special Events

The I-10 at SR 51 (US 129) interchange provides primary access to the Spirit of the Suwannee Music Park located 5.6 miles north of the interchange on SR 51 (US 129). The Spirit of the Suwannee Music Park is an 800-acre campground and music park located on the historic banks of the Suwannee River. The Park holds multiple multi-day concert music festivals throughout the year attracting up to 21,000 attendees. These events further strain the interchange at I-10 and SR 51 (US 129) with decreasing operations, increased congestion and thus deteriorating safety.

## 4. NEED

The SR 51 (US 129) interchange with I-10 is an important component of the SIS in Suwannee County, Florida and provides access to the City of Live Oak. The objective of the IOAR is to propose improvements that will provide a safer and more operationally efficient interchange.

### 4.1 Operational Performance

The I-10 at SR 51 (US 129) interchange ramps and intersections operate at an acceptable LOS D or better during the AM and PM peak hours in Existing Year 2020. Travel Demand forecasts indicate that the study area is expected to experience traffic growth in future years. Based on the anticipated growth in traffic, operating conditions at the interchange and the study intersections will further deteriorate. The SR 51 (US 129) at I-10 Westbound ramp terminal intersection will operate at LOS E during the PM peak hour in Opening Year 2025. Additionally, the SR 51 (US 129) at I-10 Eastbound ramp terminal intersection, SR 51 (US 129) at I-10 Westbound ramp terminal intersection, and SR 51 (US 129) at the Busy Bee North Entrance will operate at LOS F during the AM and PM peak hour in Design Year 2045. The proposed project will address these concerns by increasing capacity and enhancing operations at the interchange and providing acceptable operating conditions through the Design Year 2045.

### 4.2 Transportation Capacity

An increase in demand on I-10 and SR 51 (US 129) interchange is anticipated in the future due to growth in Suwannee County. As a result, additional traffic demand on I-10 and at the interchange will need to be addressed. **Table 4-1** summarized the anticipated traffic growth within the study area.

**Table 4-1: Forecasted Growth in Traffic Volumes**

Segment	Existing Year (2020)	Design Year (2045)	Percent Growth
<b>I-10 Eastbound</b>			
West of SR 51	15,700	24,600	56.7%
East of SR 51	16,600	26,200	57.8%
<b>I-10 Westbound</b>			
West of SR 51	15,400	24,300	57.8%
East of SR 51	16,100	25,300	57.1%
<b>I-10 Ramps</b>			
Eastbound Off-Ramp	1,900	2,900	52.6%
Eastbound On-Ramp	2,800	4,500	60.7%
Westbound Off-Ramp	2,700	4,200	55.6%
Westbound On-Ramp	2,000	3,200	60.0%
<b>SR 51</b>			
North of I-10	5,400	8,500	57.4%
South of I-10	13,400	21,000	56.7%

### 4.3 Safety

The crash analysis results reveal there were a total of 73 crashes on SR 51 (US 129) within the project area during the five study years 2014 to 2018. The predominant crash pattern experienced within the study area include angle crashes (47%) indicating risky decision making by motorist at intersections. If no improvements are made within the project limits of SR 51 (US 129) then the crash rate could progressively become worse as traffic increases in the area. The proposed project will implement operational improvements at the intersections and provide additional capacity that will assist in alleviating these safety concerns within the project limits.

### 4.4 Emergency Evacuation

I-10 and SR 51 (US 129) corridors serve as part of the emergency evacuation route network designated by the Florida Division of Emergency Management and Suwannee County. This interchange is critical in facilitating traffic flow during emergency evacuation periods.

### 4.5 Special Events

The Spirit of the Suwannee Music Park is an 800-acre campground located on the historic banks of the Suwannee River and is located 5 miles north of the SR 51 (US 129) and I-10 interchange on SR 51 (US 129). The Park hosts numerous events throughout the year, the largest of which was recorded to have 21,000 attendees. The proposed project will help lessen the increased strain these larger events will put on the transportation system within the study area.