

## 1. EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District Five has prepared an Interchange Modification Report (IMR) for the proposed interchange reconfiguration at I-4 and Sand Lake Road from a partial cloverleaf interchange to a DDI, other arterial improvements, and a portion of the westbound express lane “Tube” (approximately 3 miles). The I-4 and Sand Lake Road interchange modification project is funded for construction in fiscal year 2022 (FPID 444315-1). The I-4 and Sand Lake Road interchange modification is the first project in a phased approach to implementing the recommendations made in the I-4 Beyond the Ultimate (BtU) South Systems Access Management Report (SAMR) and Project Development and Environment (PD&E) Study which was granted Safety, and Operational and Engineering (SO&E) acceptability in May 2017 by FHWA. Future projects in the I-4 BtU South Section will be evaluated as construction funding is identified.

The FDOT affirms the following statements that were included in the I-4 BtU SAMR report dated March 2017 which was granted SO&E acceptability in May 2017 by FHWA:

*The FDOT has committed to re-evaluating the traffic impacts of each segment during the design phase. This will allow for updates to be made to key tools such as the regional travel demand model, the use of state-of-the-art analysis procedures, and the collection and analysis of current traffic conditions. The FDOT is also committed to continuing to work with FHWA in defining a methodology and following an agreed to review process for future re-evaluation studies.*

The FDOT acknowledges that the recommendations made in the I-4 BtU SAMR and PD&E Study which was granted Safety, and Operational and Engineering (SO&E) acceptability in May 2017 by FHWA are being revisited. The FDOT will continue to coordinate with FHWA as changes to the concepts, phasing, or delivery method are identified.

The purpose of this IMR is to document the potential safety and operational impacts of the proposed interchange, typical section, and arterial modifications being proposed as part of the I-4 and the Sand Lake Road interchange modification project. The findings of the operational and safety analysis and the FHWA Policy Point discussion are summarized as follows:

### **Purpose and Need**

- The purpose of this project is to improve traffic operations, enhance connectivity, and improve safety on I-4 and the Sand Lake Road interchange cross-streets in the immediate vicinity of I-4. Improvements to the operation and safety of the Sand Lake Road interchange area will improve mobility and support economic growth.
- The “Tube” provides users of the westbound I-4 Ultimate express lanes desiring to make longer distance trips on I-4 the opportunity to avoid conflicts with local traffic on the general use lanes. The purpose of the “Tube” is to improve the safety and operations on the westbound general use lanes through the interchange areas (Sand Lake Road, SR 528, Central Florida Parkway, Daryl Carter Parkway, SR 535, SR 536, and Osceola Parkway) that are located adjacent to the

“Tube” and to improve the safety and operations at the I-4 Ultimate express lane termination point. The “Tube” will allow the longer distance trips on I-4 utilizing the westbound express lanes to bypass existing congestion on the I-4 general use lanes. The improvements to the operation and safety of I-4 will improve mobility and support economic growth.

### **Future Traffic Operations**

- The microsimulation (VISSIM) analysis shows that the Build scenario provides improved operations to the No Build scenario along I-4 during each of the future year AM and PM peak hours while removing an existing westbound on-ramp as part of the existing partial cloverleaf configuration. The analysis confirmed that capacity improvements, such as those identified in the I-4 BtU South Section SAMR and PD&E Study, are needed along I-4 to address mainline bottlenecks (e.g., near Central Florida Parkway) and queuing on the westbound C-D system and will be evaluated as funding becomes available.
- The travel time along westbound I-4 within the area of influence (AOI) is expected to be reduced with the westbound express lane “Tube” as part of the Build scenario. The I-4 westbound express lane “Tube” is expected to provide travel time benefits ranging between approximately 5 and 56 percent within the AOI.
- The Build scenario VISSIM results show improvements over the No-Build scenario at each of the study intersections along Sand Lake Road including the interchange area and the adjacent intersections at Turkey Lake Road and International Drive. These improvements mitigate queue spillback between the signalized intersections along Sand Lake Road, improving travel time by 13 to 90 percent, and reducing the maximum queue lengths along both off-ramps.
- Spillback onto the mainline I-4 lanes is not expected to occur under the Build scenario during the future year simulation models.
- Performance metrics such as average delay, average speed, total delay, latent demand, latent delay, and vehicles arrived are better in the Build when compared to the No-Build for each analysis year analyzed.

### **Future Safety Performance**

- The Build condition is anticipated to improve safety conditions at the beginning of the express lane “Tube” north of Sand Lake Road when compared to the No-Build condition from a qualitative perspective. The results of the predictive safety analysis for the ramp reconfigurations show the proposed improvements in the Build scenario are predicted to reduce crashes and save over \$2 million in crash costs over the 20 year life cycle of the project.
- The DDI itself is anticipated to reduce overall crashes, reduce the number of severe injury crashes, and potentially reduce wrong-way maneuver crashes through the I-4 at Sand Lake Road interchange area from a qualitative perspective.

### **FHWA Policy Points**

- The proposed improvements satisfy FHWA’s Two Policy Point Requirements included in the May 22, 2017 update to “Policy on Access to the Interstate System”.

- Policy Point 1: The safety and operational analyses conducted as part of this IMR have concluded that the proposed interchange improvements and express lane “Tube” improvements do not have a significant adverse impact on the safety and operations of I-4 through the study area.
  - The proposed improvements improve the operations along Sand Lake Road and reduce the queue lengths along the off-ramps, mitigating the impact of queue spillback from the ramp terminal intersections onto the I-4 mainline lanes.
  - The proposed improvements are predicted to result in fewer crashes along the I-4 mainline and reduce the overall crashes at the interchange.

As described above in the *Future Traffic Operations* and *Future Safety Performance* sections, the proposed action of building the I-4/Sand Lake Road interchange and the “Tube” safely and efficiently collects, distributes, and accommodates the traffic anticipated to use the improvements.

As noted in the *Future Traffic Operations* section above “The analysis confirmed that capacity improvements, such as those identified in the I-4 BtU South Section SAMR and PD&E Study, are needed along I-4 to address mainline bottlenecks (e.g., near Central Florida Parkway) and queuing on the westbound C-D system and will be evaluated as funding becomes available.” At this time, the FDOT is using a phased approach to implement improvement projects as construction funding is identified.

- Policy Point 2: The proposed improvements will maintain full access between I-4 and Sand Lake Road. All traffic movements are being provided.

The interchange improvements evaluated as part of the Build scenario fulfill the project’s purpose and need and satisfy the FHWA Policy Points.