

Executive Summary

The Florida Department of Transportation (FDOT) District One requests the FDOT Systems Implementation Office approval of an Interchange Operational Analysis Report (IOAR) for the improvement of the Interstate 275 (I-275) interchange at US 41 in Manatee 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 State Highway System (SHS), FDOT Procedure No. 525-030-160: Approval of New or Modified interchange access to limited facilities on SHS, the Interchange Access Request User's Guide (2020), the Interchange Access Request User's Guide Safety Analysis Guidance (2020) and the FDOT's 2019 Project Traffic Forecasting Handbook (Procedure No. 525-030-120).

Purpose and Need

I-275, a major facility that runs predominantly north/south, is part of the Federal Highway System (National Highway System) and Interstate System. Within the State of Florida, I-275 is an integral part of the Florida's Strategic Intermodal System (SIS), providing for high-speed and high-volume traffic movements within the state. I-275 is a major route for freight and through traffic, while also providing connectivity among Hillsborough, Pinellas, and Manatee counties. As such, this interstate plays a critical role in both the regional and state-wide economy and in emergency evacuation plans. US 41 is a major north-south United States highway that traverses from Miami, Florida to the Upper Peninsula of Michigan. US 41 is the designated SIS highway connector, providing a direct connection between Port Manatee, I-275 and I-75. A substantial amount of truck traffic from Port Manatee utilizes this interchange to access I-75 and subsequently the rest of the state.

A Traffic Signal Warrant Analysis for the I-275 southbound ramp termini intersection with US 41 was completed in March 2020 using traffic counts collected on February 11, 2020, before traffic patterns were altered by the COVID 19 pandemic. The Signal Warrant Analysis concluded that the intersection meets warrants 1A and 2 based on traffic volumes. The study also documented that a major source of the eastbound vehicle delay is the high percentage of southbound left turning trucks, which require more storage space within the median opening and larger gaps in conflicting northbound traffic. Due to the delay time and number of queued southbound trucks, some eastbound left turning vehicles were observed to "give up" and turn right (southbound) from the left turn lane. Based on the results and recommendations from the study, the intersection has been added to the list of approved traffic signal locations by the District.

A traffic signal is being proposed at the intersection of the I-275 southbound ramp termini intersection with US 41 to ensure an orderly flow of traffic, provide an opportunity for vehicles to cross the intersection, and prevent excessive delay. The traffic signal will improve safety by reducing the number of conflicts between

vehicles entering the intersection from different directions. The traffic signal will also provide efficient interstate access/egress for freight traffic destined to Port Manatee. Other improvements include replacing the span wire mounted traffic signals at the northbound ramp termini intersection with mast arm mounted traffic signals, and installation of special emphasis crosswalks and pedestrian features at both ramp terminal intersections.

Compliance with FHWA General Requirements

The Federal Highway Administration (FHWA) Interchange Access Policy was checked to assure that the adequate level of service is provided in terms of safety and mobility. The FHWA's Policy on Access to the Interstate System provides the requirements for the justification and documentation necessary to substantiate any proposed changes in access to the Interstate System. This policy also facilitates decision-making regarding proposed changes in access to the Interstate System in a manner that considers and is consistent with the vision, goals, and long-range transportation plans of a metropolitan area, region, and State. All new or modified points of access must be approved by FHWA and developed in accordance with federal laws and regulations (as specified in 23 U.S.C. 109 and 111, 23 C.F.R. 625.4, and 49 C.F.R. 1.48(b)(1)). The following documents the adherence of the proposed I-275 at US 41 improvements to FHWA's two Policy Points:

FHWA Policy Point 1

An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, and ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis should, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (Title 23, Code of Federal Regulations (CFR), paragraphs 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, should be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access should include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute, and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request should also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

Satisfaction of FHWA Policy Point 1

The operational analysis documented in this IOAR included the I-275 ramp merge/diverge areas, the I-275 at US 41 ramp terminal intersections, and the US 41 arterial. The analysis demonstrates that the intersection of US 41 at the I-275 SB Ramps intersection is anticipated to experience excessive delays and to operate at LOS F during the design year 2034 under the no build condition. Moreover, the 95th percentile queue in the left-turn from the off-ramp is anticipated to extend beyond the available off-ramp storage and will likely spill into the I-275 main line. The proposed improvement to install a traffic signal at the US 41 at I-275 SB Ramps intersection provides significant benefits to the operations of the interchange by managing the queues at the off ramp and by improving the progression of traffic along US 41.

In addition, providing a traffic signal at the US 41 at I-275 SB Ramps intersection will control movements through the intersection and reduce the potential angle and left-turn conflicts which occur at higher frequencies at stop-control intersections. An added benefit from the proposed improvements is that converting the traffic signal at the US 41 at I-275 NB Ramps intersection from the span-wire mounted signal to a mast-arm mounted signal is expected to produce annual crash reductions (roughly 1 FI crash and 1 PDO crash every ten years). Lastly, the proposed improvements include the installation of crosswalks and pedestrian features at both ramp termini intersections. Currently, there are no crosswalks, warning signage, or pavement markings identifying pedestrian crossings on US 41 and the interchange ramps. The proposed crosswalks and signage will help address these needs. Additionally, pedestrian crossings of US 41 and the interchange ramps will be accounted for in the signal phasing at both ramp terminals. These improvements will increase pedestrian mobility and safety in the interchange area.

In conclusion, the operational and safety analysis has demonstrated that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility, the adjacent interchanges, or on the local street network based on both the current and the planned future traffic projections.

FHWA Policy Point 2

The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access, such as managed lanes (e.g., transit or high occupancy vehicle and high occupancy toll lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)). In rare instances where all basic movements are not provided by the proposed design, the report should include a full-interchange option with a comparison of the operational and safety analyses to the partial interchange option. The report should also include the mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectation leading to wrong-way movements on ramps, etc. The

report should describe whether future provision of a full interchange is precluded by the proposed design.

Satisfaction of FHWA Policy Point 2

The existing I-275 at US 41 interchange is a diamond interchange that connects to a public road (US 41) and provides for all traffic movements. The recommended I-275 at US 41 interchange improvements maintain the diamond interchange configuration and continue to provide for all traffic movements to and from US 41. The proposed access connects to a public road only and will provide for all traffic movements. Therefore, the Build Alternative is recommended for implementation at the I-275 at US 41 interchange.

Recommendation

It is recommended that the Build Alternative be constructed to improve the safety and operational conditions at the I-275 at US 41 interchange for vehicles, pedestrians, and bicyclists. It is also recommended that the intersections of US 41 at the I-275 SB Ramps and US 41 at 73rd Street/69th Street be continuously monitored for improvements to ensure that there are no detrimental impacts to the interchange. Lastly, it is recommended that the District continues to evaluate ultimate improvements for the I-275 freeway segment between I-75 and US 41 in the northbound direction.