

Executive Summary

Florida's Turnpike Enterprise (FTE) is in the process of preparing a Project Development and Environment (PD&E) study [FPID 423374-1] for widening a 36-mile section of Florida's Turnpike from north of Jupiter / Indiantown Road at Milepost (MP) 116 to north of Fort Pierce / Okeechobee Road (SR 70) at MP 152. This section of Florida's Turnpike is currently a four-lane (two lanes in each direction) limited-access facility. Existing interchanges within the study corridor include SW Martin Highway (SR 714), Becker Road, Port St. Lucie Boulevard (SR 716), and Okeechobee Road (SR 70). The PD&E study is evaluating widening the 36-mile section from four to eight lanes. The proposed corridor improvements will bring many additional benefits to the community, such as reduced congestion, enhanced mobility options for longer trips, and improved evacuation and emergency response times.

The primary purpose of the Martin Highway Interchange Modification Report (IMR) project is to enhance the integrity of the service interchange while accommodating future traffic demands, improving overall safety, meeting current design standards, and assessing operational impacts of the improvements to the study area. The Martin Highway interchange is the only interchange in Martin County with direct access to and from the Turnpike in Martin County, leading to more traffic demand than the existing capacity. Due to the increased traffic demand expected in the future, the widening of the Turnpike mainline to eight lanes is currently being evaluated. The Becker Road interchange, 5 miles north of the Martin Highway interchange, does not provide a direct Turnpike connection to/from the east, as Becker Road does not connect all the way to the east the way the Martin Highway interchange does. For this reason, the Martin Highway interchange becomes a natural choice for the Turnpike traffic destined for eastern Martin County.

The Martin Highway interchange has a trumpet configuration with ramps that connect to SR 714 at a single intersection. At the Martin Highway interchange, the ramp terminal intersection has a fourth (northern) leg connecting to Martin Downs Boulevard. The ramp terminal currently operates at level of service (LOS) D during both the AM and the PM peak hours. As traffic demand increases in the future, traffic operations are expected to deteriorate within the interchange weaving section, thus impacting the freeway mainline. This IMR evaluates the traffic operations of the No-Build and Build alternatives.

The information and analysis indicate that the southbound off-ramp diverge areas along Florida's Turnpike and the ramp intersection with Martin Highway are projected to experience operational failures in 2045 during the AM peak hour. Proposed modifications to the mainline, ramps, and the interchange are recommended to address projected deficiencies in the future. Specific modifications and projected benefits are the following:

- The proposed Build alternative provides for the separation of the heaviest off-ramp right-turn movement (northbound to eastbound) from the left-turn and through movements on the northbound approach of the ramp terminal.
- The Build alternative also eliminates the weave between the northbound through and left-turn movements from the northbound and southbound off-ramps.
- The arrangement proposed under the Build alternative not only eliminates the weaving

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between the movements from the northbound and southbound off-ramps, but also reduces the demand on the northbound approach by approximately 400 vehicles per hour (vph) by diverting the movement from southbound Turnpike to westbound Martin Highway from the existing ramp terminal to a roundabout on Leighton Farm Avenue.

- The Build alternative is projected to reduce the average vehicle delay at the Turnpike ramp terminal intersection by more than 70 seconds/vehicle (approximately 58 percent reduction) during the 2045 AM design hour and by 150 seconds/vehicle (approximately 63 percent reduction) during the 2045 PM design hour when compared with the 2045 No-Build intersection delays.
- Even though there are deficiencies projected for the Build Alternative at the intersection of SW High Meadow and Martin Highway Boulevard intersection, it should be noted that there is little or no degradation in the eastbound direction queues compared to the No-Build alternative. Based on the 2040 Treasure Coast Regional Long-Range Transportation Plan, no improvement has been identified at Martin Highway Boulevard and SW High Meadow intersection.

The mainline and ramp freeway segments are projected to operate at LOS D or better under the Build condition.

These improvements address the traffic operation deficiencies by eliminating or improving the failing conditions within the interchange influence area and improving safety by reducing congestion and improving operating conditions along Martin Highway and the ramp terminal. A comparison of the Design Year 2045 intersection analysis results shows that the Build alternative is projected to provide better operating conditions than the No-Build in Design Year 2045. The Highway Safety Manual (HSM) safety analysis shows that the overall predicted crashes are lower for Build compared to No-Build. Based on the HSM results, the Build alternative is predicted to have a 20-year crash cost savings of approximately \$27 Million compared to the No-Build alternative, in 2019 present value.

A discussion of the access modifications with respect to conformance with the Federal Highway Administration (FHWA) policy points related to access is provided below. Florida's Turnpike is not, however, part of the interstate system.

Considerations and Requirements

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*

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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)).

The operational analysis conducted for the IMR confirmed that the proposed interchange modifications are not expected to have adverse impacts on safety and operations on the Florida's Turnpike. The proposed Build alternative provides for the separation of the heaviest off-ramp right-turn movement (northbound to eastbound) from the left-turn and through movements on the northbound approach of the ramp terminal. Furthermore, this alternative also eliminates the weave between the northbound through and left-turn movements from the northbound and southbound off-ramps. The arrangement proposed under the Build alternative not only eliminates the weaving between the movements from the northbound and southbound off-ramps but also reduces the demand on the northbound approach by approximately 400 vph. The Build alternative is projected to reduce the average vehicle delay at the Turnpike ramp terminal intersection by more than 70 seconds/vehicle (approximately 58 percent reduction) during the 2045 AM design hour and by 150 seconds/vehicle (approximately 63 percent reduction) during the 2045 PM design hour when compared with the 2045 No-Build intersection delays.

The projected failing conditions under the No-Build alternative are expected to increase future crash risk within the project corridor. This potential for increased crash risk is alleviated by the capacity improvements proposed in the Build alternative. The overall predicted crashes are lower for Build compared to No-Build. Based on the HSM results, the Build alternative is predicted to have a 20-year crash cost savings of approximately \$27 Million compared to the No-Build alternative, in 2019 present value.

- 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.*

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This IMR does not propose new interchanges along Florida's Turnpike. The existing interchange provides access to public roads only. The improvements proposed at the interchange will maintain full access to the existing cross streets and accommodate all movements.