

Executive Summary

The Central Florida Expressway Authority (CFX) has performed several studies on the SR 516/Lake Orange Connector, as referenced in this Systems Interchange Modification Report (SIMR), to evaluate the need, preferred alignment, cross-section, interchange type and local road improvements along US 27, CR 455 Extension, Valencia Parkway and SR 429. The SR 516/Lake Orange Connector, which is an expansion project, is a new four-lane tolled expressway alignment connecting SR 429 to US 27. The alignment is midway between SR 50 to the north and US 192 to the south and provides the only regionally significant connection between these roadways for 19 miles. This expressway provides a much-needed east-west facility in this area of the Orlando metropolitan area, connecting two principal arterials, and significantly improving regional mobility. The new expressway will include an interchange with US 27 and realignment of US 27 to accommodate the improvements while avoiding impacts to Lake Louisa State Park. The project corridor is expected to improve connectivity between Lake and Orange counties, as well as meet future traffic needs.

Freeway analysis of the segments, and merge/diverge movements show acceptable Level of Service (LOS) for 2025 and 2045 conditions. Interchange alternative evaluations confirm that the grade separated interchange at US 27 will perform with shorter delays, better LOS, and shorter queue lengths over a T-intersection with either a signal or stop condition. The Build alternative has new access points and higher traffic along US 27 when compared to the No-Build, which results in a slightly higher prediction of potential crashes of approximately three percent. However, the Build will reduce travel time within the network by providing a direct and shorter east-west connection between US 27 and SR 429. Reduction in regional travel time/congestion for the Build alternative is expected to reduce potential crashes in the area and improve safety. The Build alternative is predicted to have a 20-year travel time savings of approximately \$645 Million compared to the No-Build alternative.

This study concludes that the grade separated interchange at SR 516 and US 27 will improve overall traffic flow and operations of the roadway network in the area. In concert with other CFX roadway improvement projects proposed along SR 429, the new SR 516 expressway will become an integral part of the toll road system and regional highway network, providing an improved experience for public roadway and tollway users.

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, 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 (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroad 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 crossroads and local street network (23 CFR 625.2(a) and 655.603(d)). Each request should include a conceptual plan of the type and location of signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

Summary Findings

Operational and safety analyses were performed to evaluate the impacts of the proposed Lake Orange County Connector Expressway (SR 516) including a new interchange access at US 27. A traffic operations and safety analysis of the existing, future No-Build, and three alternative Build conditions for the US 27 interchange have been conducted within this study using several performance measures. The first intersections on either side of the proposed access location on US 27 were evaluated in addition to the analysis completed as part of the Lake Orange County Connector Project Traffic Analysis Report (PTAR). These measures of effectiveness are based on freeway density, freeway speeds, following density, levels of service, intersection delay, stop queues, safety benefits, and user benefits. Overall, the network will be improved with the SR 516 Expressway, and it will become an integral part of the toll road system, the regional highway network and supplement other CFX roadway improvement projects along SR 429.

As the proposed four-lane divided facility, the SR 516 Expressway freeway density would be LOS C or better. The new expressway is driven by regional mobility needs in this rapidly growing area of Central Florida. The ramp terminals for all interchanges along the SR 516 corridor will operate at LOS D or better. The merge and diverge operations are LOS C or better for all freeway movements, except the on-ramp merge condition along northbound SR 429 from eastbound SR 516 which operates at LOS D in the AM peak hour. The intersections of US 27 at Lake Louisa State Park and Sawgrass Bay Boulevard were degraded slightly by the increased traffic volumes, but still operate at LOS D or better in the 2045 Build condition in both the AM and PM peak hours. The traffic operations analysis showed that the grade separated alternative performed better than the stop-control and signalized intersection conditions related to LOS, delay, and queue lengths.

Trips currently using long and, in some cases, circuitous routes to travel from south Lake County to west Orange County will have the option to use a direct and faster connection. SR 516 will also include north/south connections at CR 455 and Valencia Parkway, enhancing travel throughout the region. As a result, the Build alternative is expected to reduce Vehicle Hours of Travel (VHT) by approximately 9,900 hours in 2025 and 9,000 hours in 2045, respectively, within the travel demand model subarea for facilities impacted by SR 516. The reduction in VHT (*aka*, travel time savings) translated to a 20-year user benefit of \$645 Million for the Build alternative compared to the No-Build. Reduction in regional travel time/congestion for the Build alternative is expected to significantly reduce potential crashes in the region and improve safety. In addition, the design of the project follows FDOT standards to provide features that mitigate potential crashes such as long auxiliary lanes, adequate sight distances, gentle cross-slopes, super elevation, wide curve radii, wide shoulders, signing and lighting among others. Overall, it is expected that SR 516 will significantly improve regional mobility, traffic operations and safety in the area. The conceptual signing plan for the project is provided in **Appendix F**.

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, HOVs, HOT 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 analysis to the partial-interchange options. 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.

Summary Findings

The proposed new SR 516 expressway with a grade separated interchange at US 27 will provide full access and facilitate all traffic movements from the SR 516 expressway to US 27. There will be a full access interchange at the proposed CR 455 Extension, a half an interchange at the proposed Valencia Parkway, providing access to and from the west, and a full access, grade-separated interchange at SR 429. A half interchange at Valencia Parkway is proposed due to its proximity to the SR 429 grade-separated interchange. The proposed alignment meets current design standards and conforms to American Association of State and Highway Transportation Officials (AASHTO) and the FDOT design standards.