

2.6 Alternatives Considered

The following scenarios were considered for this SIMR:

- SR 429 Existing Year (2018)
 - AM and PM peak hours
- US 27 Existing Year (2021)
 - AM and PM peak hours
- Opening Year (2025)
 - No-Build – AM and PM peak hours
 - Build – AM and PM peak hours
 - Stop-Controlled Intersection – AM and PM peak hours
 - Signalized Intersection – AM and PM peak hours
 - Grade Separated Ramps – AM and PM peak hours
- Design Year (2045)
 - No-Build – AM and PM peak hours
 - Build – AM and PM peak hours
 - Stop-Controlled Intersection – AM and PM peak hours
 - Signalized Intersection – AM and PM peak hours
 - Grade Separated Ramps – AM and PM peak hours

The existing year 2018 was used for SR 429 as this was the existing year for the PD&E analysis. As part of the SIMR analysis additional traffic counts were taken in 2021 for the analysis of the US 27 intersections, as US 27 was under construction at the time of the PD&E study.

The build alternatives for the US 27 interchange with SR 516 considered for this analysis were a stop condition, signalized intersection and grade separated ramps. The PD&E study recommended grade separated ramps to accommodate future traffic in the area, and during the design process these ramps were refined to go under US 27 to lessen sight impacts to Lake Louisa State Park. For this analysis the recommended grade separated ramps were analyzed in addition to a stop-controlled and signalized intersection. The concepts for these three interchange alternatives are shown in **Figures 4, 5 and 6**.

The stop-controlled alternative, shown in **Figure 4**, has a T-intersection at US 27, with exclusive southbound left-turn and northbound right-turn lanes on US 27 and two lanes in each direction on SR 516 in both the 2025 and 2045 analysis years.

The signalized intersection alternative also has a T-intersection at US 27, with a southbound left-turn

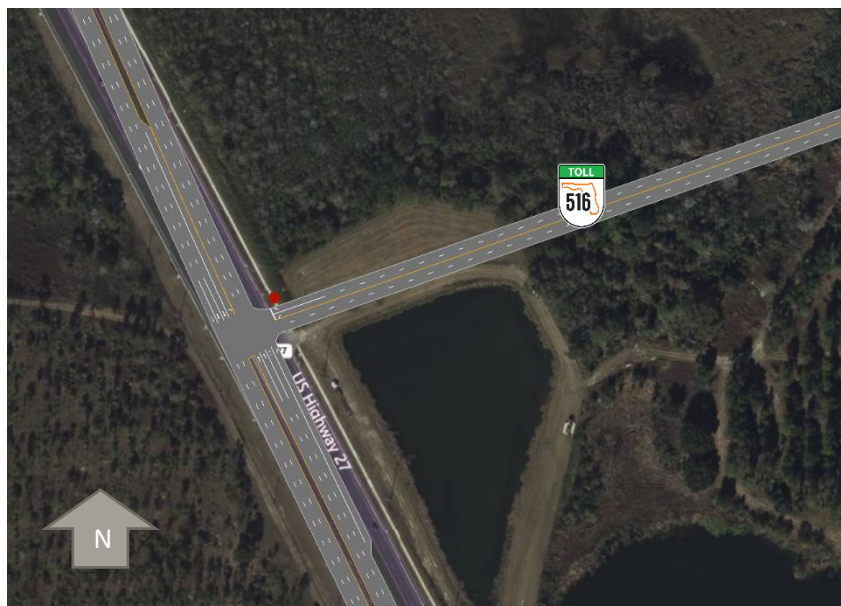


Figure 4: US 27 Interchange Alternative - Stop Condition (2045)

lane and a northbound right-turn lane in 2025 and dual southbound left-turn lanes in 2045. Both analysis years have two lanes in each direction on SR 516, as shown in **Figure 5**.

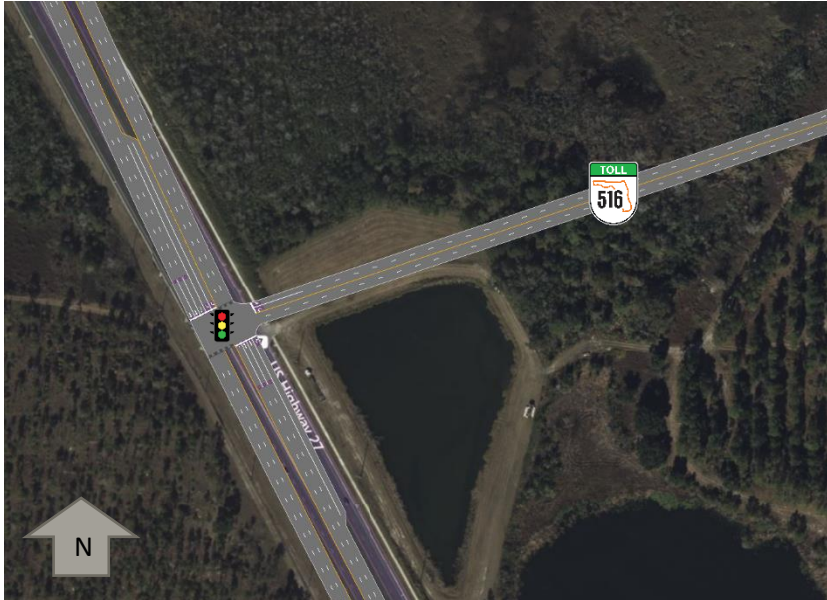


Figure 5: US 27 Interchange Alternative - Signalized (2045)

The grade separated ramp alternative has two one-lane ramps from the east side of US 27 and two one-lane ramps that originate on the west side of US 27 and travel under US 27 to start SR 516 on the west end of the project, as shown in **Figure 6**.

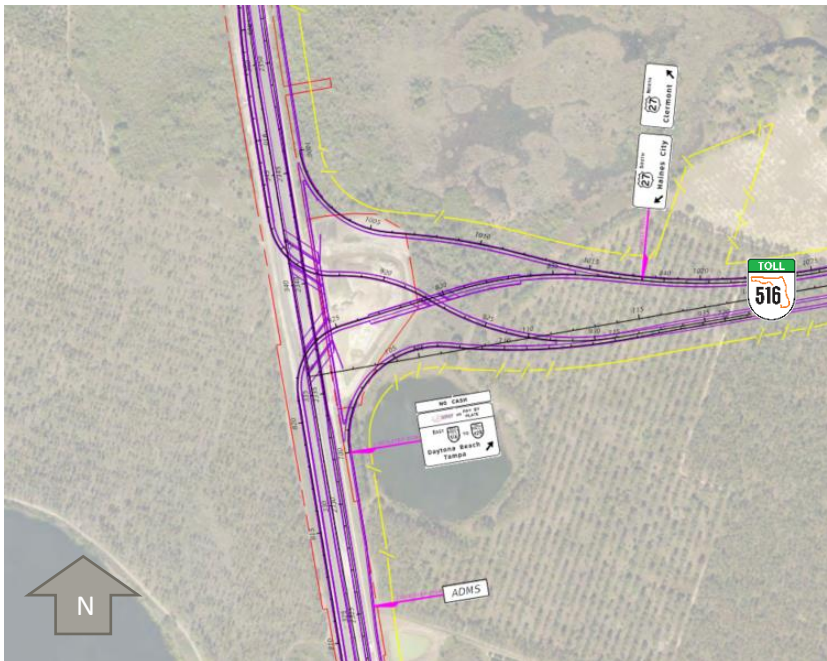


Figure 6: US 27 Interchange Alternative - Grade Separated Ramps (2045)

12. Conclusion and Recommendation

CFX has performed several studies on the SR 516/Lake Orange Connector, as referenced in this 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 US 27 to SR 429. 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 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 the traditional 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 ramps at SR 516 and US 27 will provide the best traffic operations for the interchange. This alternative contributes less to wrong-way driving on expressways, provides a free-flow transition from the state highway to tolled expressway and will also provide an improved experience for public roadway and tollway users.