

8.5 Operational Comparisons

HCM 2010 outputs utilized do not take into consideration the free-flow northbound right when calculating LOS and delay since it is a channelized movement. However, the HCM 2010 northbound approach LOS does anticipate an improvement in LOS for the Build Alternative versus the No-Build Alternative. Table 19 provides the I-95 northbound off-ramp approach LOS for the No-Build and Build Alternatives under a.m. and p.m. peak-hours for Opening Year 2016 and Design Year 2026. As indicated in the table, the northbound approach LOS at the northbound off-ramp is expected to improve under the Build Alternative.

**Table 19
I-95 Northbound Off-Ramp Approach Level of Service
I-95 at LPGA Blvd IOAR**

Alternative	Year	Adopted LOS	AM Peak-Hour		PM Peak-Hour	
			Delay (sec.)	LOS	Delay (sec.)	LOS
No-Build	2016	D	70.2	E	69.3	E
	2026		78.5	E	75.4	E
Build	2016		51.2	D	35.5	D
	2026		49.9	D	41.3	D

The intersection of the I-95 northbound off-ramp at LPGA Boulevard operates at LOS C with an estimated delay of 32.8 seconds under a.m. peak-hour conditions for Opening Year 2016 Build Alternative. The No-Build Alternative for these conditions operates at LOS A with an estimated delay of 8.1 seconds. In Opening Year 2016 under p.m. peak-hour Build conditions, the intersection operates at LOS B with an estimated delay of 12.0 seconds. The No-Build Alternative for these conditions operates at LOS A with an estimated delay of 7.2 seconds.

The intersection of the I-95 northbound off-ramp at LPGA Boulevard operates at LOS D with an estimated delay of 43.8 seconds under a.m. peak-hour conditions for Design Year 2026 Build Alternative. The No-Build Alternative for these conditions operates at LOS B with an estimated delay of 11.4 seconds. In Design Year 2026 under p.m. peak-hour Build conditions, the intersection operates at LOS B with an estimated delay of 16.4 seconds. The No-Build Alternative for these conditions operates LOS B with an estimated delay of 12.3 seconds.

8.6 Safety

Crash data studied from the past five years previously discussed suggests that crash rate (MVMT) of LPGA Boulevard within the AOI is under the district wide average for an urban minor arterial four lane with raised median. The 2-mile segment studied along I-95 does have a higher crash rate than the statewide and districtwide averages. This segment does include four (4) entrance and two (2) exit points and auxiliary lanes north of LPGA Boulevard. The highest contributor of these crashes were rear-end, other, and off-road.

The 95th percentile queue in the eastbound direction at LPGA Boulevard and Technology/Outlet Boulevard is anticipated to stack up and block northbound right-turn traffic from safely merging during

a.m. peak-hour conditions. The removal of this free-flow movement reduces the anticipated safety concerns for northbound right traffic entering the eastbound LPGA Boulevard traffic stream.

8.7 Environmental Impacts

The No-Build Alternative will pose no environmental impacts at the interchange influence area as it is the existing configuration. The removal of the free-flow right-turn lane at the I-95 northbound off-ramp is anticipated to remove approximately one-third (0.33) of an acre of impervious material. The addition of the two right-turn lanes at the existing I-95 northbound off-ramp signal is anticipated to add approximately one-quarter (0.25) of an acre of impervious surface area. This will provide a net reduction of approximately 0.08 acres. The Build Alternative is not expected to impact air quality, contamination sites, navigation, wetlands, floodplains, protected species, community centers/institutions (churches, schools, etc.), historical/archaeological sites, and noise sites.

8.8 2036 Analysis

As previously mentioned in Section 3.2, a 2036 analysis of the Build Alternative under a.m. and p.m. peak-hour conditions was conducted at the request of FDOT in order to determine if and when failures occurred in the influence area between 2026 and 2036. The findings show that northbound right-turn movement failures occur on the I-95 northbound off-ramp at LPGA Boulevard intersection under p.m. peak-hour conditions using 2026 signal timing parameters. Interpolation of delay values for this movement from Design Year 2026 and 2036 show that p.m. peak-hour failure occur at years 2028. Optimized timings may eliminate these approach failures.

The intersection of the I-95 northbound off-ramp at LPGA Boulevard experiences failure in 2036 under a.m. peak-hour conditions. Interpolation of delay values for the intersection from Design Year 2026 and 2036 show that a.m. peak-hour failures occur at years 2030. This analysis and supporting documents have been provided in Appendix S.

9. CONCLUSIONS

This IOAR was conducted to analyze the proposed off-ramp modification on the I-95 northbound off-ramp at LPGA Boulevard located in Daytona Beach, Volusia County, Florida. The modification includes elimination of the existing northbound right-turn free-flow onto eastbound LGPA Boulevard and relocation of the movement to the existing ramp signal via dual northbound right-turn lanes. The modification is proposed due to the anticipated inadequate merge condition for the northbound free-flow movement resulting from the signal at Technology/Outlet Boulevard.

Based on the analyses conducted, it can be concluded that all study intersections including the northbound off-ramp intersection are projected to operate within the adopted LOS under Build Alternative conditions. Furthermore, the northbound approach LOS at the northbound off-ramp is not projected to operate outside of adopted LOS D under the Build Alternative. The Build Alternative's proposed dual northbound right-turn lanes are recommended to have 600 ft. of storage due to Design Year 2026 queue analysis. And although the merge and weave analyses regarding the free-flow movement indicate an acceptable LOS under Opening Year 2016 and Design Year 2026, they do not take into account large 95th percentile queues occurring in the eastbound through lanes that will deteriorate merge/weave conditions. These anticipated large queues are anticipated to make the merge or any weaves unsafe, inefficient, and are not accounted for in HCM 2010 methodologies.

An analysis of crashes within the influence area indicate that the crash rate on LPGA Boulevard, 1.027 per MVMT, is lower than the districtwide average for urban minor arterials with raised medians. However, an analysis of crashes on I-95 mainline indicates that the crash rate, 0.765, is higher than statewide and districtwide averages for an urban interstate. Further safety analysis indicates that four (4) crashes occurred within the vicinity of this free-flow merge condition and a total of twenty-one (21) reported on the