2045 Network-Wide Performance

Table 7-12 summarizes the network-wide performance results for the Original Build and Modified Build Alternatives during the 2045 AM and PM peak periods. Comparison of the alternatives shows that the Modified Build consistently exhibited better performance than the Original Build in terms of delay, average speed, number of stops and latent demand.

In terms of average speed, the Modified Build shows better performance than the Original Build during both peak periods, with AM and PM average speed increases of 2% and 7%, respectively. Total delay reduction for the Modified Build were 12% (AM peak) and 25% (PM peak). Noticeable improvements were also reported for latent delay, total travel time, and total stops. This upholds the results observed in the previous sections, in which the Modified Build eliminates the pockets of congestion observed on I-95 northbound and southbound in the Original Build.

Table 7-12 2045 Network-Wide Performance

AM PEAK	Original Build	Modified Build	
Average Speed (mph)	48	49	2%
Total Delay (hr)	12,898	11,411	-12%
Latent Delay (hr)	4,013	2,499	-38%
Latent Demand	733	175	-76%
Total Travel Time (hr)	60,410	58,881	-3%
Total Stops	1,079,768	906,361	-16%
Vehicles Arrived	444,535	444,703	0%
PM PEAK	**Original Build**	**Modified Build**	
Average Speed (mph)	46	49	7%
Total Delay (hr)	14,364	10,830	-25%
Latent Delay (hr)	10,200	1,791	-82%
Latent Demand	1,837	199	-89%
Total Travel Time (hr)	60,436	56,997	-6%
Total Stops	1,203,043	816,038	-32%
Vehicles Arrived	449,494	450,830	0%

Note: Percentages indicate comparisons to the Original Build.

7.5 Future Conditions Safety Analysis

The AASHTO Highway Safety Manual (HSM) methodology was used to compare the predicted crashes of the Original Build Alternative and the Modified Build Alternative against a “do-nothing” alternative. While there is not a “No-Build” alternative presented in this SIMR, the predictive safety analysis was performed for a scenario using the existing geometry in the study area to determine the benefit of each of the Build alternatives over the existing configuration. The segments analyzed were the freeway mainline segments between on-ramp and adjacent off-ramp (between interchanges). Thirteen (13) freeway segments were analyzed from International Golf Parkway to Atlantic Boulevard.

The Enhanced Interchange Safety Analysis Tool (ISATe) was used to apply the HSM predictive methodologies for this analysis. ISATe is a spreadsheet-based tool that helps to streamline the application of Safety Performance Functions (SPFs) and Crash Modification Factors (CMFs) as specified for freeway segments from the 2014 HSM Supplement. The SPF for Multiple-Vehicle Crashes is represented by HSM Equation 18-15 and the SPF for Single-Vehicle Crashes is represented by HSM Equation 18-18. The SPFs were also specified by crash severity, Fatal and Injury (FI) and Property Damage Only (PDO), and area type, Urban, using coefficients from HSM Tables 18-5 and 18-7 for Multiple-Vehicle and Single-Vehicle crashes, respectively. The base conditions for the SPFs used are the following:

- Lane width of 12 feet
- Inside shoulder width of 6 feet
- Median width of 60 feet
- No presence of median barrier
- No presence of shoulder rumble strip
- Outside shoulder width of 10 feet
- Clear zone of 30 feet
- No presence of outside barrier

Crash Modification Factors (CMFs) are applied to SPFs in order to estimate the Predicted Crashes for scenarios where the geometry does not match the base conditions of the SPF. The following CMFs were applied to the SPFs for FI crashes and PDO crashes during the HSM analysis:

- Lane Width
- Inside Shoulder Width
- Median Width
- Median Barrier
- Outside Shoulder Width
- Outside Clearance
- Outside Barrier

Limitations exist regarding the available base conditions for SPFs. For this analysis the number of through lanes available for analysis was limited to 10 lanes total for both directions of travel. Eight segments in the study area exceeded 10 through lanes of travel in the Original Build Alternative. Of those eight Original Build segments, three Modified Build segments also exceeded 10 through lanes of travel. These Build segments were analyzed as a 10-lane segment and any potential benefit of additional through lanes beyond the maximum of 10 may not be realized. An additional assumption for the Original Build Alternative analysis is that express lanes were included in the total count of through lanes.

The 2030 and 2045 AADTs were utilized in the No-Build, Original Build, and Modified Build Alternatives freeway segment safety analysis. **Table 7-13** contains the total annual predicted crashes for the analysis alternatives as well as the percent difference between No-Build and the two Build Alternatives. The Original Build and Modified Build provide similar safety benefits when compared to the No-Build configuration. The Original Build provides an overall 22% decrease in annual predicted crashes while the Modified Build provides an overall 21% decrease in annual predicted crashes. The areas with higher predicted crashes for the