

4.0 Alternative Analysis

4.1 Cost of Improvement

The Dual Right-Turn Lanes Alternative (Alternative 5) is the recommended build alternative from the five alternatives that were proposed as part of this IOAR. The total construction cost for this improvement includes costs for pay items and quantities calculated using the FDOT's Long Range Estimating (LRE) System. The cost in present day (2014) dollars to construct the recommended improvement is estimated to be \$544,000 [Note: Preliminary Engineering (PE) design and Construction Engineering Inspection (CEI) are not included in this estimate]. The LRE is provided in **Appendix G**. There is no right of way (R/W) acquisition needed to implement the recommended improvement.

4.1.1 Funding Source

The proposed improvement to provide a second southbound-to-westbound right-turn lane at the southbound I-275/22nd Avenue South ramp terminal intersection is currently identified as cost affordable project in the FDOT Work Program (WPID: 437040-1). The proposed off ramp is a safety and operational improvement intended to resolve existing deficiencies. Construction funding for this improvement is programmed in Fiscal Year 2018/2019.

4.2 Safety Benefit-to-Cost Analysis

A safety Benefit-to-Cost (B/C) analysis was performed to justify capital expenditures to implement the recommended build alternative. The safety benefit of implementing the recommended build alternative was estimated by using crash reduction factors and applying these factors to historical crash data. Using the United States Department of Transportation⁴ (USDOT)/Federal Highway Administration (FHWA) crash reduction factors, the benefit to cost ratio of implementing the proposed improvement is estimated to be 12.88. The benefit-to-cost analysis sheets are provided in **Appendix H**.

4.3 Operational Benefit-to-Cost Analysis

An operational B/C analysis was performed to justify capital expenditures to implement the recommended build alternative. The operational benefit of implementing the recommended build alternative was estimated through various Measures of Effectiveness (MOEs) obtained from the Synchro³ Version 8.0 software. The operational benefit of the recommended build alternative, based on vehicle delay, fuel consumption, and vehicle emissions is determined to be 6.72. In order to determine the life-cycle benefit, future year (2040) traffic volumes were obtained from the I-275 PD&E Study from South of 54th Avenue South to North of 4th Street (FPID 424501-1-22-01). The B/C sheets for the operational analysis are provided in **Appendix H**.