



EXECUTIVE SUMMARY

INTRODUCTION

In May 2019, the FDOT received approval from FHWA for the SIMR Re-evaluation of proposed improvements within the Golden Glades Interchange (GGI). The improvements approved in the 2019 SIMR Re-evaluation constitute the current GGI Ultimate Design Concept. Following this approval, the FDOT determined that some of the proposed improvements per the GGI Ultimate Design Concept would be indeterminately delayed due to unresolved conflicts with existing Florida Gas Transmission pipelines. As a result, the FDOT is seeking to advance construction of an interim design concept, known as the GGI Light Design Concept, which will accommodate the Florida Gas Transmission facilities in their current location. The GGI Light Design Concept incorporates all the proposed improvements in the GGI Ultimate Design Concept except for the following (see Figure 3-3 and Figure 3-4 under Section 3 of report):

- GGI Light excludes the proposed new flyover ramps providing direct connections between the proposed SR 826 Express Lanes and I-95 Express lanes (North). It also excludes widening required along SR 826 and I-95 to accommodate the future express lanes connection. This proposed new connection will be implemented with the planned SR 826 Express Lanes.
- GGI Light excludes the proposed widening along some ramps within the GGI system, per the Ultimate Design Concept. Notably it eliminates the proposed widening for the following ramps:
 - Loop ramp connecting movements from NB I-95 (GU) to WB SR 826. Proposed widening from one to two lanes (per GGI Ultimate) is not included in GGI Light.
 - Ramp connecting movements from EB SR 826/Palmetto Expressway to EB SR 826/NW 167th Street is not included in GGI Light.
- Proposed 3-lane off-ramp from EB SR 826/Palmetto Expressway (per GGI Ultimate) is modified to a one-lane off-ramp serving NB I-95 traffic only.
- GGI Light assumes that the planned SR 826 Express Lanes and improvements to the interchanges at NW 27th Avenue and NW 17th Avenue will not be implemented by the design year 2048.

The FDOT determined that a re-evaluation of the current approved 2019 SIMR Re-evaluation was necessary to support implementation of the interim GGI Light Design Concept. This report documents the findings of the SIMR Re-evaluation to support implementation of the GGI Light Design Concept.

METHODOLOGY

The SIMR re-evaluation was performed in accordance with the associated Methodology Letter of Understanding (MLOU) which was approved by FDOT and FHWA in March 2022. The MLOU is included herein under Appendix A. It describes the criteria, assumptions, processes, analyses, and documentation requirements for the SIMR Re-evaluation. The SIMR Re-evaluation assumes an opening year 2028 and design year 2048 for the proposed improvements. Traffic forecasts for the project are based on prior forecasts that were developed and approved for SR 826 and GGI improvements. Future traffic operations for the design alternatives are assessed using CORSIM microsimulation models. Safety conditions are evaluated based on a qualitative and quantitative assessment following the Highway Safety Manual Procedures.

DESIGN CONCEPTS

The SIMR Re-evaluation considered three future conditions (See Figures 3-2, 3-3 and 3-4):

- No Build Alternative: This includes the existing road network plus all funded and committed projects within the study corridor.
- The GGI Ultimate Design Concept: This is the current approved design concept for the GGI per the 2019 SIMR Re-evaluation.
- The GGI Light Design Concept: This is the interim design concept which is the subject of this SIMR Re-evaluation.

OPERATIONAL ANALYSES

Traffic operational analyses were performed for the No Build Alternative (2028 and 2048), GGI Light Design Concept (2028 and 2048) and the GGI Ultimate Design Concept (2048). The analyses were performed using CORSIM microsimulation models and resulting performance measures were used to assess and compare traffic operations within the study area for the three design alternatives. Throughput was used as the principal performance measure for determining



the relative performance of the alternative design concepts. This approach is consistent with FDOT's policy of maximizing throughput on facilities operating under congested conditions, similar to the GGI. The following were determined from the operational analyses.:

- The GGI Light Design Concept will provide better traffic operating conditions within the GGI Study Area when compared to the No Build Alternative in the opening year 2028 and design year 2048. The operational analyses indicate that the GGI Light Design Concept will generate higher throughput (GU lanes + express lanes) when compared to the No Build for all the major routes of interest for the study, this includes I-95, I-95/Turnpike Connector and SR 826. In addition, the operating speeds are generally higher or comparable in the GGI Light Design Concept when compared to the No Build Alternative. In cases where the GGI Light Design Concept generates noticeably lower speeds this results from the increase in throughput generated in the GGI Light Design Concept. Furthermore, the GGI Light Design Concept performs better than the No Build Concept across all networkwide performance measures including, total delay, total vehicle-miles travelled, average speed and unmet (latent) demand.
- The GGI Ultimate Design Concept will provide better overall traffic operating conditions than the GGI Light Design Concept. However, implementation of the GGI Light Design Concept will not result any critical operational failures which would otherwise be mitigated by the GGI Ultimate Design Concept, through the design year 2048. The operations analyses indicate that the GGI Ultimate Design Concept will mostly generate higher throughput (GU lanes + express lanes) when compared to the GGI Light Design Concept. In cases where the GGI Ultimate Design Concept generates less throughput than the GGI Light Design Concept this is due to the rerouting of some traffic in response to additional capacity provided by the proposed SR 826 Express Lanes which is only present in the GGI Ultimate Design Concept. Operating speeds are generally higher in the GGI Ultimate Design Concept except for cases where substantially higher throughput is generated in the GGI Ultimate Design Concept (i.e., EB SR 826) or segments with substantially higher demand volume. Furthermore, the GGI Ultimate Design Concept performs better than the GGI Light Concept across all networkwide performance measures including, total delay, total vehicle-miles travelled and average speed.

- The GGI Light Design Concept will not generate any systemic failures within the GGI through year 2048. However, improvements beyond the GGI Light Design Concept will be required at such time in the future when capacity improvements are implemented along I-95 and SR 826/Palmetto Expressway. Traffic demand along these freeway systems exceed the available capacity which meters traffic entering the GGI. Hence, as more capacity is added to I-95 and SR 826, traffic volumes entering the GGI will increase and systemic failure may occur, if future capacity improvements to the mainline systems and the GGI are not coordinated.

SAFETY ANALYSES

Historical crash data for the 5-year period 2015 through 2019 was reviewed for the segments of I-95 and SR 826/Palmetto Expressway located within the area of influence for the project. In addition, a quantitative assessment of predicted future crashes was performed per the Highway Safety Manual (HSM) procedures with computations made using the Interactive Highway Safety Design Module (IHSDM). A qualitative crash analysis was also performed to support the safety analysis. The following were determined from the safety analysis:

- Historical data confirmed that segments of the existing I-95 and SR 826 corridors experienced abnormally high crash rates during the 5-year period 2015 through 2019. If no improvements are implemented, the existing high crash rates will continue in the future.
- The segment of highest safety concern is along I-95 mainline from NW 151st Street to GGI. Excessive congestion and weaving activities are contributing causes for the high crash rates experienced within this segment of I-95. The proposed I-95/Turnpike Express Lane Connectors, per the GGI Light and GGI Ultimate Design Concepts, will improve safety within this segment of I-95 by reducing congestion and weaving activities.
- The segment of SR 826 from NW 27th Avenue to GGI is a high crash location. Excessive congestion is a contributing cause for crashes experienced in this location. The proposed new flyover for connecting EB SR 826 to NB I-95 (per GGI Light and GGI Ultimate) will reduce congestion and corresponding crash risk along SR 826. The proposed SR 826/I-95 Express Lanes connects (GGI Ultimate) will further reduce congestion and corresponding crash risk along SR 826.



- Due to the complexity of the GGI and various limitations of the HSM Predictive Method, it was determined that the procedure would not provide a reliable prediction of the expected crashes along I-95 and SR 826 for the alternative future scenarios. These limitations include the presence of managed lanes and 3-lane collector-distributor roads which are not covered by the Predictive Method. Hence, the Predictive Method was applied solely as an indicator to assess the relative safety performance of the GGI Interchange under the future Build and No Build scenarios. Results from the Predictive Method indicate that implementation of the GGI Light Design Concept and the GGI Ultimate Design concept would reduce crashes along I-95 and SR 826/Palmetto Expressway.

ASSESSMENT OF FHWA POLICY POINTS

The FHWA's Policy on Access to the Interstate System provides the requirements for the justification and documentation necessary to substantiate any proposed changes in access to the Interstate System. The current SR 826 SIMR Re-evaluation (approved May 2019) incorporates an assessment of the two considered requirements that are specified in the current FHWA's Policy on Access to the Interstate System. Updates to the policy point assessments are necessary for approving and authorizing the interim GGI Light Design Concept. In this regard, the SIMR Re-evaluation offers updated responses to Policy Point #1 and Policy Point #2 as follows:

Policy Point 1 (previously Item No. 3)

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 shall, 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 crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall 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 must 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 crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

Addendum to Policy Point No. 1 Response (pertaining to documentation contained herein for the GGI Light Design Concept)

Detailed operations analyses were performed comparing the No Build Alternative, the current approved GGI Ultimate Design Concept (per 2019 SIMR Re-evaluation) and the proposed interim GGI Light Design Concept. The analyses confirmed that the GGI Light Design Concept will not have any adverse safety or operational impacts on I-95 and SR 826. The analyses demonstrated that the GGI Light Design Concept will provide better traffic operating conditions within the GGI Study Area when compared to the No Build Alternative. The analyses also demonstrated that the GGI Ultimate Design Concept will provide better overall traffic operating conditions than the GGI Light Design Concept. However, implementation of the GGI Light Design Concept (an interim improvement) will not result any critical operational failures which would otherwise be mitigated by the GGI Ultimate Design Concept, through the design year 2048. These findings are support by the results from the analyses presented below.

In evaluating the operational performance of the design alternatives, it must be recognized that the GGI operates in a congested environment where peak period traffic demand volumes exceed the capacity of the network. In such conditions, capacity improvements will often yield an increase in throughput accompanied by a decrease in operating speeds along some road segments. Hence, in comparing the GGI design alternatives, throughput is used as the principal performance measure for determining if one alternative performs better or worse than another. This approach is consistent with FDOT's policy of maximizing throughput on facilities operating under congested conditions, similar to the GGI. The following results from the analyses support these findings.

Comparison of 2028 Operating Conditions for No Build and GGI Light Design Concept:

Results from the 2028 operations analysis indicate that the GGI Light Design Concept generates



higher throughput (GU lanes + express lanes) when compared to the No Build for all the major routes of interest for the study: NB I-95 (11.6%/14.2% increase in AM/PM); SB I-95 (28.9%/40.4% increase in AM/PM), NB I-95/Turnpike Connector (8.3%/7.3% increase AM/PM), SB I-95/Turnpike Connector (79.8%/112.9% in AM/PM), EB SR 826 (33.4%/30.4% increase in AM/PM) and WB SR 826 (2.4%/9.0% increase in AM/PM). In addition, average operating speeds in the GU lanes are higher or comparable under the GGI Light Concept when compared to the No Build Alternative.

Average operating speeds for the peak direction of travel in GU lanes for GGI Light / No Build are:

- NB I-95 - 42 mph / 34 mph, PM peak
- SB I-95 – 47 mph / 53 mph, AM peak (GGI has higher throughput of approximately 1,300 vehs. /hr.)
- NB I-95/Turnpike Connector – 16 mph / 13 mph, PM peak
- SB I-95/Turnpike Connector – 44 mph / 12 mph, AM peak
- EB SR 826 – 45 mph / 10 mph, AM peak
- WB SR 826 – 45 mph / 57 mph, PM peak (GGI Light has higher throughput of approximately 500 vehs. /hr.)

In addition to the above, the GGI Light Design Concept performs better across all networkwide performance measures including, total delay (decrease by 40.0%/14.2% in AM/PM), total vehicle-miles travelled (increase by 13.8%/19.3% in AM/PM), average speed (increase by 34.8%/21.1% in AM/PM) and unmet (latent) demand (decrease by 75.7%/83.5% in AM/PM).

Comparison of 2048 Operating Conditions for No Build and GGI Light: Results from the 2048 operations analysis indicate that the GGI Light Design Concept will generate higher throughput (GU lanes + express lanes) when compared to the No Build for all the major routes of interest for the study: NB I-95 (11.1%/19.4% increase in AM/PM); SB I-95 (23.3%/41.8% increase in AM/PM), NB I-95/Turnpike Connector (8.5%/16.2% increase AM/PM), SB I-95/Turnpike Connector (84.7%/113.1% increase in AM/PM), EB SR 826 (26.3%/39.3% increase in AM/PM) and WB SR 826 (4.5% increase in PM). WB SR 826 shows a decrease in throughput of 3.3% in AM peak due to new signals installed at upstream intersection (NW 7th Avenue at NB Turnpike On-Ramp) under the GGI Light Design Concept. In addition to higher throughput, average operating speeds in the GU lanes are mostly higher or comparable under the GGI Light Design Concept when compared

to the No Build Alternative. Average operating speeds for the peak direction of travel in GU lanes for GGI Light / No Build are:

- NB I-95 - 44 mph / 34 mph, PM peak
- SB I-95 – 28 mph / 51mph, AM peak. (Lower speed in GGI Light is due to the higher throughput in the GU lanes – an increase of approximately 850 vehs/hr compared to No Build)
- NB I-95/Turnpike Connector – 17 mph /14 mph, PM peak
- SB I-95/Turnpike Connector – 36 mph / 12 mph, AM peak
- EB SR 826 – 50 mph / 9 mph, AM peak
- WB SR 826 – 42 mph/55 mph, PM peak (Lower speed in GGI Light due to higher throughput – an increase of approximately 250 vehs/hr compared to No Build)

In addition to the above, the GGI Light Design Concept performs better across all networkwide performance measures including, total delay (decrease by 23.5%/14.6% in AM/PM), total vehicle-miles travelled (increase by 12.6%/19.1% in AM/PM), average speed (increase by 23.8%/25.0% in AM/PM) and unmet (latent) demand (decrease by 61.4%/51.7% in AM/PM).

Comparison of 2048 Operating Conditions for GGI Light and GGI Ultimate: Results from the 2048 operations analysis indicate that the GGI Ultimate Design Concept will generate higher throughput (GU lanes + express lanes) when compared to the GGI Light Design Concept for most of the major routes of interest for the study, including: NB I-95 (3.4%/5.1% increase in AM/PM); NB I-95/Turnpike Connector (3.6%/5.0% increase AM/PM), EB SR 826 (116.4%/83.8% increase in AM/PM) and WB SR 826 (1.8%/13.2% increase in AM/PM). The most significant increase in throughput occurs along EB SR 826 due to the presence of the express lanes which provides additional capacity in the GGI Ultimate Design Concept. The presence of the SR 826 express lanes in the GGI Ultimate Design Concept also generates some rerouting of traffic to SR 826 and a reduction in demand along SB I-95. Hence, the GGI Ultimate Design Concept reflects a lower throughput along SB I-95 (-7.2% / -6.5% in AM/PM) and along SB I-95/Turnpike Connector (-17.3% /-5.5% in AM/PM). Average operating speeds in the GU lanes are mostly higher or comparable under the GGI Ultimate Design Concept when compared to the GGI Light Design Concept.



Average operating speeds for the peak direction of travel in GU lanes for GGI Ultimate / GGI Light Design Concept:

- NB I-95 - 34 mph / 44 mph, PM peak (Lower speed in GGI Ultimate is due to higher throughput – an increase of approximately 300 vehs./hr. when compared to GGI Light)
- SB I-95 – 48 mph / 28 mph, AM peak (Lower speed in GGI Light due to higher throughput – an increase of approximately 700 vehs./hr. compared to GGI Ultimate. Demand volumes also higher under GGI Light)
- NB I-95/Turnpike Connector – 46 mph / 17 mph, PM peak (Lower speed in GGI Light due to capacity restriction at the one lane off-ramp to WB SR 826 which is widened to 2 lanes in GGI Ultimate)
- SB I-95/Turnpike Connector – 45 mph / 36 mph, AM peak (Lower speed in GGI Light due to higher throughput – an increase of approximately 880 vehs./hr. compared to GGI Ultimate. Demand volume also higher under GGI Light)
- EB SR 826 – 21 mph / 50 mph, AM peak (Lower speed in GGI Ultimate due to higher throughput. Demand volume also higher under GGI Ultimate)
- WB SR 826 – 57 mph / 42 mph, PM peak. (Lower speed in GGI Light is due to the higher volume in the GU lanes – an increase of approximately 1000 vehs./hr compared to GGI Ultimate. Total throughput is still higher under GGI Ultimate since it includes express lanes on SR 826 which are not present in GGI Light.

The GGI Ultimate Design Concept performs better than GGI Light across all networkwide performance measures including, total delay (decrease by 19.3%/15.4% in AM/PM), total vehicle-miles travelled (increase by 6.3%/8.5% in AM/PM), average speed (increase by 15.4%/15.0% in AM/PM) and unmet (latent) demand (decrease by 38.1%/17.4% in AM/PM).

Safety: A safety analysis was performed which revealed that segments of the existing I-95 and SR 826 corridors experienced abnormally high crash rates during the 5-year period 2015 through 2019. If no improvements are implemented, the existing high crash rates will continue in the future. The segment of highest safety concern is along I-95 mainline from NW 151st Street to GGI. Excessive congestion and weaving activities are contributing causes for the high crash rates experienced within this segment of I-95. The proposed I-95/Turnpike Express Lane Connectors, per the GGI

Light and GGI Ultimate Design Concepts, will improve safety within this segment of I-95 by reducing congestion and weaving activities. Similarly, the proposed new flyover for connecting EB SR 826 to NB I-95 (per GGI Light and GGI Ultimate) will reduce congestion and corresponding crash risk along SR 826. The proposed SR 826/I-95 Express Lanes connects (GGI Ultimate) will further reduce congestion and corresponding crash risk along SR 826.

Due to several limitations of the current Highway Safety Manual (HSM) crash prediction methodology, a limited crash prediction analysis was performed solely as an indicator to assess the relative safety performance of the GGI Interchange under the future Build and No Build scenarios. The results from the crash prediction analysis were consistent with the qualitative safety assessment indicating that the implementation of the GGI Light Design Concept and the GGI Ultimate Design Concept will improve safety conditions at the interchange

A Conceptual Master Signing Plan for the GGI Light Design Concept is included under Appendix E.

Policy Item #2 (previously Item No. 4)

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 analyses to the partial-interchange option. 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



Addendum to Policy Point No. 2 Response (pertaining to documentation contained herein for the GGI Light Design Concept)

The SIMR proposes no new interchanges along any of the freeway facilities within the project limits (I-95 and SR 826). All existing interchanges provide access to public roads only. The improvements proposed at the interchanges will maintain full access to the existing interstate facilities and cross streets and accommodate all movements. The proposed access modifications will be designed to meet or exceed current design standards, to the extent possible.

The design changes proposed per the GGI Light Design Concept have been developed with due consideration for all applicable FDOT and FHWA design criteria.

PROJECT FUNDING AND SCHEDULE

The proposed GGI Light improvements are funded in FDOT's Five Year Work Program as a conventional design-bid-build project. The proposed improvements are funded for design and construction with an anticipated letting date in July 2023 and open to traffic in 2028. Estimated construction cost for the GGI Light Improvements is approximately \$472 Million. Letting is scheduled for 2031 for the portion of the improvements to implement an auxiliary lane on NB I-95 north of NW 2nd Avenue On-Ramp. All other proposed improvements are scheduled to be open by 2028.

CONCLUSION

Based on the findings from the SIMR Re-evaluation, the GGI Light Design Concept satisfies the FHWA's Policy on Access to the Interstate System and the proposed design change will not result in any adverse impacts to safety or operations along I-95 and SR 826. Therefore, the GGI Light Design Concept is offered as an interim improvement for the GGI Interchange. The GGI Ultimate Design Concept, per the current approved 2019 SIMR Re-evaluation, will remain along with all previously agreed commitments.