



# Golden Glades Multimodal Transportation Facility Bike & Pedestrian Eastside Connectivity Study

---

Refinement of Recommended  
Bike & Pedestrian Bridge Concept  
GPC-VII TWO#46  
September 2022



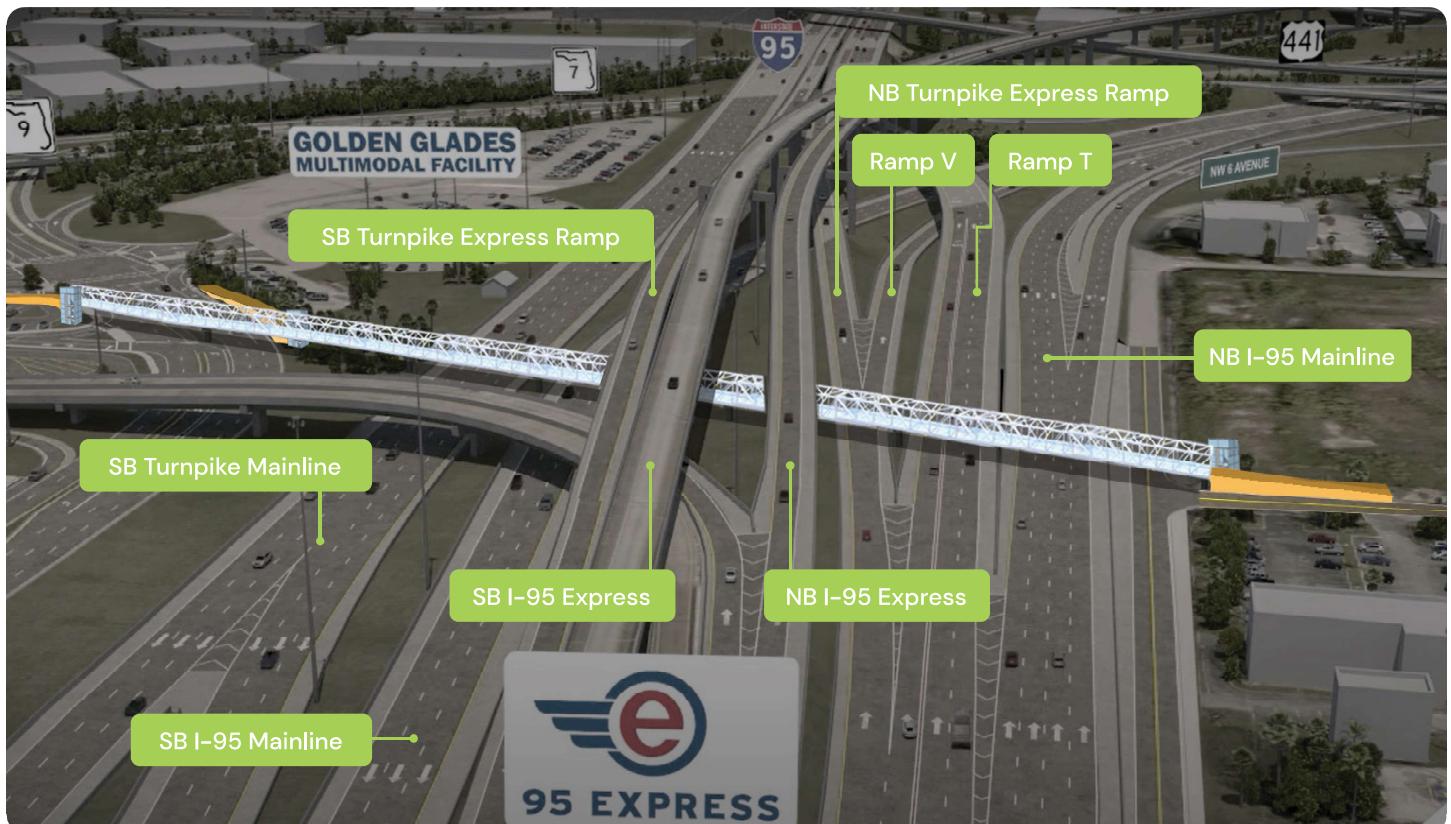
# Introduction

The purpose of this feasibility study was to determine a safe, convenient, and enticing bicycle and pedestrian connection to the GGMTF, across US-441/SR 7/ NW 7<sup>th</sup> Avenue, from the future Golden Glades Truck Travel Center (GGTTC), and from the surrounding sectors east of I-95/SR 9A. Located southeast of the Golden Glades Interchange (GGI), the GGMTF is a critical transportation hub providing multiple public transit services including intercity bus, local, limited-stop, express buses, local circulators, regional commuter rail (i.e., Tri-Rail), and ridesharing. The GGMTF has also been identified as a transit hub in the Strategic Miami Area Rapid Transit (SMART) Plan. Unfortunately, the GGMTF is inaccessible to bicyclists and pedestrians from neighborhoods east of SR 9A/I-95 given the various roadways, ramps, and canals that make up the GGI which create extensive physical and psychological mobility barriers for non-motorized modes of transportation.

To fulfill the purpose and need of the feasibility study, the study team developed a recommended alternative (see Alternative 3 in the Final Report of GPC-VII TWO# 30) that proposes constructing a 930-foot long bicycle and pedestrian bridge across US-441/SR 7/NW 7<sup>th</sup> Avenue, SR 821/Florida's Turnpike Southbound Connector, I-95/SR 9A, and NW 6<sup>th</sup> Avenue (see Figure 1). However, to make the recommended bicycle and pedestrian bridge a viable alternative, certain modifications to adjacent projects in the area are required. One modification required is the removal of 18 surface parking spaces from the GGMTF Orange Lot to accommodate the bridge landing and ramps into the GGMTF shared-use path and parking garage. Another required modification is the reconstruction of approximately 250 feet of NW 159<sup>th</sup> Street, east of NW 6<sup>th</sup> Avenue, to accommodate the bridge landing and ramp into Biscayne Gardens. Another bridge landing and ramp is proposed at the GGTTC which has yet to be designed.

Lastly, the immediate modifications required resulting from the recommended bicycle and pedestrian bridge are vertical geometry changes proposed to the ongoing GGI Enhancement Project. Comprising eight unique project segments, the proposed enhancements to the GGI will reconstruct several miles of roadways and ramps in an effort to increase regional connectivity along five major facilities: SR 9A/I- 95, SR 826/ Palmetto Expressway, Florida's Turnpike, SR 9, and US-441/SR 7/ NW 7<sup>th</sup> Avenue. In particular, the recommended alternative of the feasibility study impacts the Florida Department of Transportation (FDOT) project Financial Number (FM) Number 437053-4-52-01. Impacts include vertical geometry changes to the future Northbound Turnpike Express Ramp, Ramp V, Ramp T, and I-95 Northbound Mainline. Figure 2 illustrates the refined recommended alternative and Figure 3 illustrates the GGI Enhancement Project.

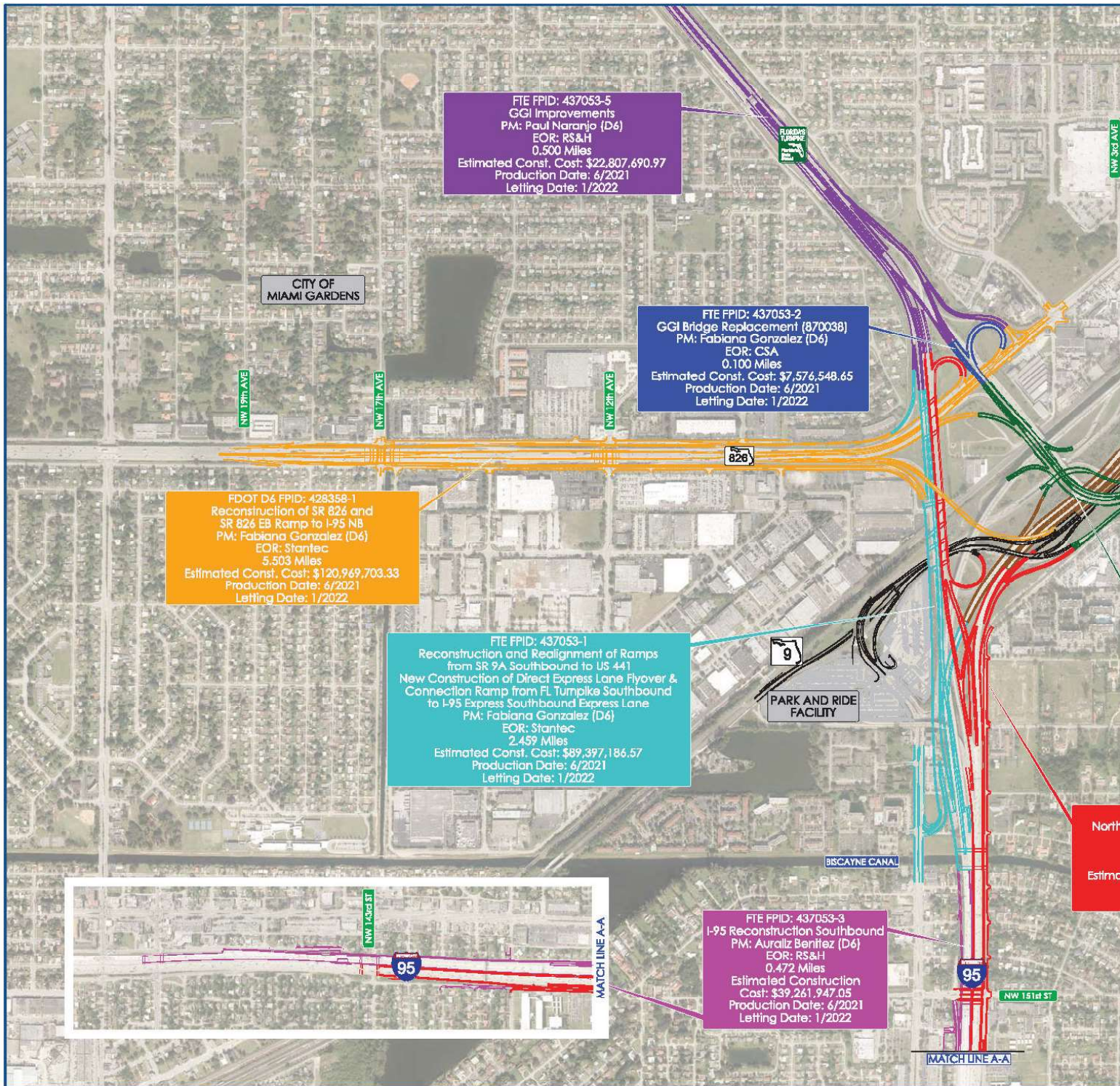
Figure 1: Pedestrian Bridge Rendering

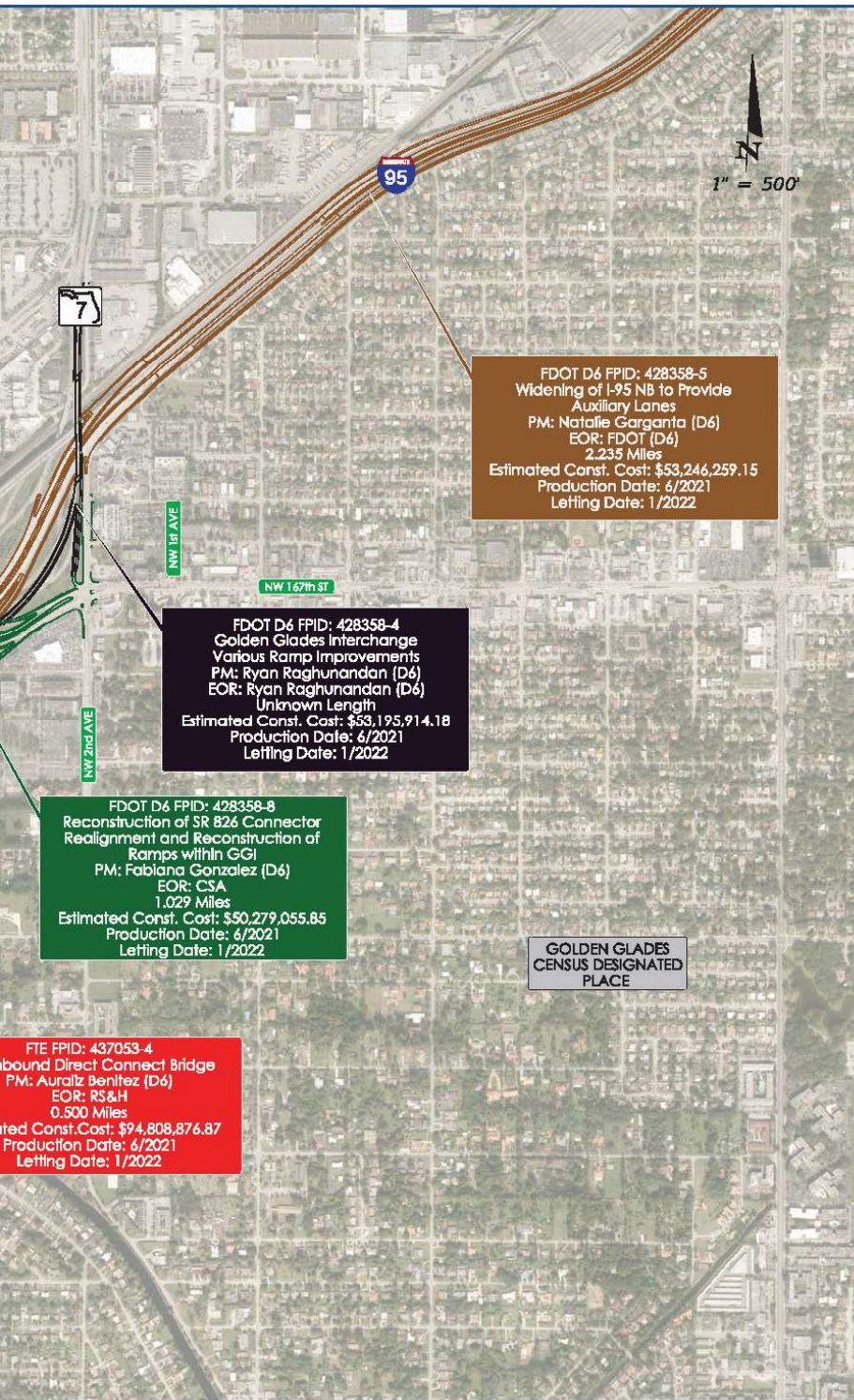


[illegible]



Figure 3: Golden Glades Interchange Enhancement Project





Through the development of the GGMTF Bike & Ped Eastside Connectivity Feasibility Study, the study team coordinated extensively with FDOT to ensure the proposed changes to Project FM Number 437053-4-52-01 were viable. On October 27, 2021 the study team presented a summary of the feasibility study to FDOT D6 Secretary Stacey Miller. During this meeting, District Secretary Stacey Miller was in favor of the recommended alternative but was very concerned about potential schedule impacts to GGI Enhancement Project given FDOT is under a strict commitment to let the construction of this project by Fiscal Year 2022/23. The ongoing GGI Enhancement Project has scheduled 90% design plans by March 2022 and 100% design plans by June 2022. During this meeting, District Secretary Stacey Miller agreed to preserve the envelope for the recommended bicycle and pedestrian bridge only if the proposed changes to the GGI Enhancement Project resulted in no schedule impacts and if FDOT could independently confirm the engineering and financial feasibility of making the proposed changes.

This report documents additional conceptual design efforts and coordination undertaken to ensure the viability of the recommended alternative from the GGMTF Bike & Ped Eastside Connectivity Feasibility Study and satisfy FDOT requirements.

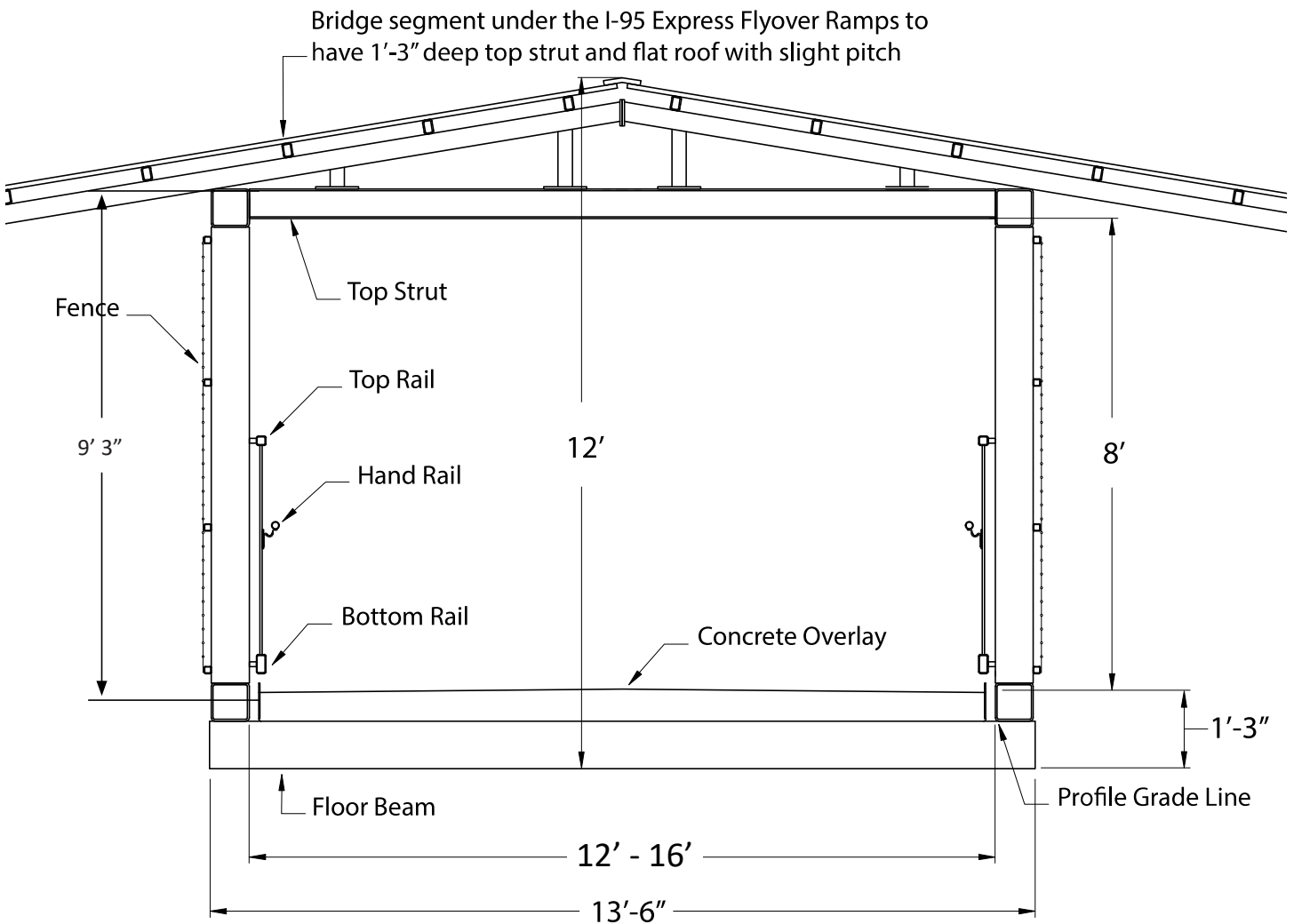
# Refinement of Recommended Bike & Pedestrian Bridge Concept

The GGMTF Bike & Pedestrian Eastside Connectivity Feasibility Study recommends a bicycle and pedestrian bridge that connects the GGMTF Orange Lot, the GGTTTC entrance, and the intersection of NW 159<sup>th</sup> Street and NW 6<sup>th</sup> Avenue (see Alternative 3). The recommended bridge has a direct horizontal geometry connecting these points and a top of structure elevation of approximately 36.5 feet. Figure 3 illustrates the recommended typical section of the proposed bicycle and pedestrian bridge. The typical section includes a 12-foot wide clear path, with the potential to increase to 16 feet to accommodate the future potential use of micromobility modes of transportation such as electric scooters, electric bicycles, cargo bicycles, golf carts, etc. The recommended alternative includes eight piers on US-441/SR 7/ NW 7<sup>th</sup> Avenue and the GGTTTC and GGI right-of-way in addition to three landings and access ramps at the GGMTF Orange Lot, GGTTTC, and on the north sidewalk of NW 159<sup>th</sup> Street.

This section documents the changes made to the recommended alternative (Alternative 3) of the GGMTF Bike & Pedestrian Eastside Connectivity Feasibility Study to ensure the proposed bridge typical section and horizontal and vertical geometries can be accommodated across the GGI.

1. The bridge was modified to have a +5% profile grade line on the segment under the SR 9A/I-95 Northbound Express Flyover and over the future Northbound Turnpike Express Ramp and Ramp T.
2. The bridge was modified to have -4.25% profile grade line on the segment under the I-95 Southbound Express Flyover Ramp.
3. A new pier was introduced between Ramp T and I-95 Northbound Mainline to accommodate new bridge grades.
4. The bridge was modified to have -4% profile grade line on the segment over I-95 Northbound Mainline and NW 6<sup>th</sup> Avenue.

Figure 3: Recommended Typical Section of the Proposed Bicycle and Pedestrian Bridge



# Review and Evaluation of FDOT GGI Enhancement Project

The GGMTF Bike & Ped Eastside Connectivity Feasibility Study recommends lowering the vertical profiles of the Northbound Turnpike Express Ramp, Ramp V, Ramp T, and I-95 Northbound Mainline by varying distances to accommodate a 17.5-foot vertical clearance from the bottom of the lowest member of the proposed bicycle and pedestrian bridge.

This effort made the following design refinements to the proposed horizontal and vertical geometry changes to Project FM Number 437053-4-52-01 to secure an envelope for the recommended bicycle and pedestrian bridge across the GGI.

1. The I-95 Northbound Mainline profile grade line was refined to be higher than previously proposed to FDOT for the preferred bridge alternative while maintaining a sawtooth profile with minimum grade tangent lengths of 250 feet.
2. The Northbound Turnpike Express Ramp profile grade line was refined to comply with minimum vertical curve requirements for a design speed of 45 MPH with K values equal to 79 feet for sag curves and equal to 98 feet for crest curves.
3. Ramp T and Ramp V profile grade lines were refined to comply with minimum vertical curve requirements for a design speed of 45 MPH with K value equal to 79 feet for sag curves. A K value equal to 61 feet was used for crest curve to be consistent with the crest curve K value proposed by Project FM Number 437053-4-52-01. The FDOT design consultants for Project FM Number 437053-4-52-01 already obtained a Design Variation for the proposed crest curve K value.
4. Slight adjustments were proposed for the profile grade line of Ramp S to provide acceptable gore breaks as the horizontal geometry of the ramp ties into the modified Ramp T.
5. Slight adjustments were proposed for the profile grade line of Ramp W to provide acceptable gore breaks as the horizontal geometry of the ramp breaks away from the I-95 Northbound Mainline.

*NOTE: K value represents the horizontal distance along which a 1% change in grade occurs on the vertical curve.*

# Coordination

Through communications with FDOT District Project Manager Engineer Supervisor for the FDOT Enhancement Project and FDOT District Six Director of Transportation Development, FDOT committed to modifying the roadway design plans for Project FM Number 437053-4-52-01 to create an envelope for the recommended bicycle and pedestrian bridge to be constructed within the interchange. FDOT clarified that the engineering design of the recommended bridge cannot be included with the current GGI Enhancement Project due to strict funding and schedule commitments for the reconstruction of the interchange. Through a series of conceptual design reviews and revisions, the study team and FDOT were able to achieve a concept that was feasible from an engineering perspective. On January 6, 2022 FDOT reviewed the latest concept presented on December 13, 2021 and agreed to proceed with revising the design of Project FM Number 437053-4-52-01 to accommodate the envelope for the recommended bicycle and pedestrian bridge based on the conceptual alignment. Changes to Project FM Number 437053-4-52-01 will be reflected on the 90% design plan submittal due May 2022.

## Updated Conceptual Cost Estimate

Table 1 presents a detailed conceptual cost estimate for the recommended bicycle and pedestrian bridge which totals approximately \$18,907,000. This alternative includes three elevator towers at each side of US-441/SR 7/NW 7<sup>th</sup> Avenue and at the intersection of NW 6<sup>th</sup> Avenue and NW 159<sup>th</sup> Street. The updated conceptual cost estimate was developed using comparable construction costs for the pedestrian bridge over W Dixie Highway/Florida East Coast Railroad (FDOT FM# 879096) in Miami-Dade County. The conceptual cost estimate also includes the reconstruction of the GGMTF Orange Lot to accommodate the proposed bridge ramp. The construction of a shared-use path along NW 159<sup>th</sup> Street, from NW 6<sup>th</sup> Avenue to Biscayne Gardens Park, is estimated to cost an additional \$1,806,000.

Table 1: Proposed Reconstruction of the GGMTF Orange Lot Conceptual Cost Estimate

ITEM TYPE	ITEM	UNIT	QTY.	UNIT PRICE	AMOUNT
<b>Roadway</b>	Inlet Protection System	EA	7.00	\$183.89	\$1,287.23
	Clearing & Grubbing	AC	0.63	\$10,178.04	\$6,451.77
	Removal of Existing Concrete	SY	507.89	\$16.41	\$8,334.52
	Type B Stabilization (Widening)	SY	32.56	\$0.78	\$25.39
	Optional Base Group 01 (Widening)	SY	32.56	\$15.22	\$495.49
	Milling Existing Asphalt Pavement, 2" Avg. Depth	SY	1872.02	\$2.02	\$3,781.49
	Superpave Asphaltic Concrete, Traffic C, PG76-22 (M&R)	TN	314.26	\$123.11	\$38,688.02
	Asphalt Concrete Friction Course, Traffic C, FC-12.5, PG 76-22 (M&R)	TN	314.26	\$148.42	\$46,641.83
	Concrete Curb & Gutter, Type D	LF	475.86	\$27.20	\$12,943.46
	Concrete Sidewalk and Driveways, 4" Thick	SY	125.09	\$38.75	\$4,847.07
	Detectable Warnings	SF	300.00	\$27.69	\$8,307.00
	Performance Turf, Sod	SY	1025.05	\$2.49	\$2,552.39
<b>Subtotal</b>					<b>\$134,355.66</b>
<b>Signing and Pavement Markings</b>	Painted Pavement Markings, STD, White, Solid, 6"	GM	0.09	\$805.69	\$73.39
	Painted Pavement Markings, STD, White, Solid, 12" for Crosswalk	LF	30.00	\$0.44	\$13.20
	Painted Pavement Markings, STD, White, Solid, 24" for Stop Line and Crosswalk	LF	30.00	\$0.81	\$24.30
	Painted Pavement Markings, STD, Yellow, Solid, 6"	GM	0.01	\$872.76	\$8.60
	Painted Pavement Markings, Final Surface	LS	1.00	\$16,763.19	\$16,763.19
	Thermoplastic, STD, White, Solid, 12" For Crosswalk	LF	30.00	\$1.62	\$48.60
	Thermoplastic, STD, White, Solid, 24" for Stop Line	LF	30.00	\$3.33	\$99.90
	Thermoplastic, Preformed, White, Solid, 24" for High Emphasis Crosswalk	LF	180.00	\$14.82	\$2,667.60
	Thermoplastic, Preformed, White, Arrow	EA	0.00	\$240.57	\$-
	Thermoplastic, STD-Other Surfaces, White, Solid, 6"	GM	0.09	\$3,763.34	\$342.81
	Thermoplastic, STD-Other Surfaces, Yellow, Solid, 6"	GM	0.01	\$3,833.83	\$37.76
<b>Subtotal</b>					<b>\$20,079.35</b>

ITEM	AMOUNT
Subtotal	\$154,435.01
Mobilization (7%)	\$10,810.45
Maintenance of Traffic (10%)	\$15,443.50
Utilities (2%)	\$3,088.70
Lighting (10%)	\$15,443.50
Drainage (10%)	\$15,443.50
Design (10%)	\$15,443.50
Geotechnical (15% of Design)	\$2,316.53
Survey (15% of Design)	\$2,316.53
CEI (8%)	\$12,354.80
Contingency (15%)	\$23,165.25
<b>Total (Rounded to Nearest Thousand)</b>	<b>\$271,000.00</b>

Table 2: Proposed Bike-Ped Bridge Conceptual Cost Estimate

ITEM TYPE	ITEM	UNIT	QTY.	UNIT PRICE	AMOUNT
<b>Structures</b>	Steel Truss	SF	12600.00	\$250.00	\$3,150,000.00
	Concrete Class IV, Bridge Substructure	CY	100.00	\$1,465.00	\$146,500.00
	Concrete Class IV, MASS Substructure	CY	1000.00	\$1,000.00	\$1,000,000.00
	Reinforcing Steel – Bridge Substructure	LB	200350.00	\$1.25	\$250,437.50
	Drilled Shaft, 48" Diameter	LF	1990.00	\$622.00	\$1,237,780.00
	Drilled Shaft Casting, 48" Diameter	LF	1850.00	\$360.00	\$666,000.00
	Core – Pilot Hole, Drilled Shaft Excavation	LF	550.00	\$45.00	\$24,750.00
	Thermal Integrity Testing, up to 4' Shaft Diameter	EA	10.00	\$1,500.00	\$15,000.00
	Bridge Drainage Pipe	LF	283.00	\$198.00	\$56,034.00
	Fencing, Type R, 6.1-7.0', w/Partial Enclosure	LF	1853.00	\$325.00	\$602,225.00
	Conduit, F&I, Embedded Concrete	LF	5574.00	\$8.40	\$46,821.60
	Junction Box, F&I, Embedded	EA	16.00	\$425.00	\$6,800.00
	Architectural – Special Walls/ Towers & Elevators	LS	3.00	\$950,000.00	\$2,850,000.00
	Fencing, Type R, 7.1-8.0', w/Full Enclosure	LF	974.00	\$545.00	\$530,830.00
	Embankment (Fill)	CY	4576.89	\$14.37	\$65,769.96
<b>Subtotal</b>					<b>\$10,648,948.06</b>
ITEM					AMOUNT
Subtotal					\$10,648,948.06
Reconstruction of the GGMF Orange Lot					\$271,000.00
Mobilization (7%)					\$745,426.36
Maintenance of Traffic (10%)					\$1,064,894.81
Utilities (2%)					\$212,978.96
Lighting (10%)					\$1,064,894.81
Drainage (10%)					\$1,064,894.81
Design (10%)					\$1,064,894.81
Geotechnical (15% of Design)					\$159,734.22
Survey (15% of Design)					\$159,734.22
CEI (8%)					\$851,915.84
Contingency (15%)					\$1,597,342.21
<b>Total (Rounded to Nearest Thousand)</b>					<b>\$18,907,000.00</b>

Table 3: Proposed Shared-Use Path on NW 159<sup>th</sup> Street Conceptual Cost Estimate

ITEM TYPE	ITEM	UNIT	QTY.	UNIT PRICE	AMOUNT
<b>Roadway</b>	Inlet Protection System	EA	3.00	\$183.89	\$551.67
	Clearing & Grubbing	AC	3.41	\$10,178.04	\$34,663.10
	Tree Removal	EA	200.00	\$27.58	\$5,516.00
	Removal of Existing Concrete	SY	1614.67	\$16.41	\$26,496.68
	Regular Excavation	CY	3901.45	\$4.49	\$17,517.51
	Type B Stabilization (Share-Use Path)	SY	2984.30	\$0.78	\$2,327.75
	Type B Stabilization (Widening)	SY	917.15	\$0.78	\$715.38
	Optional Base Group 01 (Share-Use Path)	SY	2984.30	\$15.22	\$45,420.97
	Optional Base Group 01 (Widening)	SY	917.15	\$15.22	\$13,959.08
	Milling Existing Asphalt Pavement, 2" Avg. Depth	SY	8553.95	\$2.02	\$17,278.98
	Superpave Asphaltic Concrete, Traffic A (Share-Use Path)	TN	492.41	\$112.63	\$55,459.99
	Superpave Asphaltic Concrete, Traffic C, PG76-22 (Widening & M&R)	TN	1562.73	\$123.11	\$192,387.94
	Asphalt Concrete Friction Course, Traffic C, FC-12.5, PG 76-22 (Widening & M&R)	TN	1562.73	\$148.42	\$231,940.68
	Concrete Class NS, Gravity Wall Index 400-011 (For Shared-Use Path Thickened Edge)	CY	103.26	\$572.68	\$59,135.84
	Concrete Curb & Gutter, Type F	LF	15.24	\$22.41	\$341.44
	Concrete Curb & Gutter, Type D	LF	46.27	\$27.20	\$1,258.51
	Shoulder Gutter - Concrete	LF	182.35	\$21.15	\$3,856.70
	Concrete Sidewalk and Driveways, 4" Thick	SY	785.94	\$38.75	\$30,455.07
	Detectable Warnings	SF	600.00	\$27.69	\$16,614.00
	Guardrail - Roadway, General TL-3	LF	50.00	\$22.00	\$1,100.00
	Performance Turf, Sod	SY	2598.46	\$2.49	\$6,470.15
	Patterned Pavement, Vehicular Areas (Green Colored Pavement)	SY	25.74	\$117.00	\$3,011.98
<b>Subtotal</b>					<b>\$766,479.43</b>

Table 3: Proposed Shared-Use Path on NW 159<sup>th</sup> Street Conceptual Cost Estimate (*Continued*)

ITEM TYPE	ITEM	UNIT	QTY.	UNIT PRICE	AMOUNT
<b>Signing and Pavement Markings</b>	Painted Pavement Markings, STD, White, Solid, 6"	GM	0.19	\$805.69	\$156.68
	Painted Pavement Markings, STD, White, Solid, 12" for Crosswalk	LF	479.91	\$0.44	\$211.16
	Painted Pavement Markings, STD, White, Solid, 24" for Stop Line and Crosswalk	LF	120.53	\$0.81	\$97.63
	Painted Pavement Markings, STD, White, 2-4 Dotted Guideline/6-10 Dotted Extension, 6"	GM	0.03	\$352.04	\$10.00
	Painted Pavement Markings, STD, White, Message or Symbol	EA	2.00	\$40.51	\$81.02
	Painted Pavement Markings, STD, White, Arrows	EA	8.00	\$25.11	\$200.88
	Painted Pavement Markings, STD, Yellow, Solid, 6"	GM	2.13	\$872.76	\$1,862.02
	Painted Pavement Markings, Final Surface	LS	1.00	\$16,763.19	\$16,763.19
	Thermoplastic, STD, White, Solid, 12" For Crosswalk	LF	479.91	\$1.62	\$777.45
	Thermoplastic, STD, White, Solid, 24" for Stop Line	LF	120.53	\$3.33	\$401.36
	Thermoplastic, STD, White, 2-4 Dotted Guideline/6-10 Dotted Extension, 6"	GM	0.03	\$1,343.80	\$38.18
	Thermoplastic, STD, White, Message or Symbol	EA	2.00	\$84.79	\$169.58
	Thermoplastic, STD, White, Arrows	EA	8.00	\$52.40	\$419.20
	Thermoplastic, Preformed, White, Solid, 24" for High Emphasis Crosswalk	LF	1332.00	\$14.82	\$19,740.24
	Thermoplastic, Preformed, White, Arrow	EA	0.00	\$240.57	\$-
	Thermoplastic, STD-Other Surfaces, White, Solid, 6"	GM	0.19	\$3,763.34	\$731.83
	Thermoplastic, STD-Other Surfaces, Yellow, Solid, 6"	GM	2.13	\$3,833.83	\$8,179.43
<b>Subtotal</b>					<b>\$49,839.86</b>
<b>Structures</b>	Removal of Existing Structures/Bridges	SF	1920.00	\$26.63	\$51,129.60
	Concret Class IV, Culverts	CY	89.42	\$780.00	\$69,748.24
	Concrete Class IV, Bridge Culverts	CY	89.42	\$858.87	\$76,800.86
	Pedestrian / Bicycle Railing, Steel Only, 48" Type 1	LF	50.00	\$57.20	\$2,860.00
	Concrete Parapet, Pedestrian / Bicycle, 27" Height	LF	50.00	\$115.00	\$5,750.00
	Concrete Sidewalk and Driveways, 4" Thick	SY	123.73	\$38.75	\$4,794.54
<b>Subtotal</b>					<b>\$211,083.23</b>

ITEM	AMOUNT
Subtotal	\$1,031,851.11
Mobilization (7%)	\$72,229.58
Maintenance of Traffic (10%)	\$103,185.11
Utilities (2%)	\$20,637.02
Lighting (10%)	\$103,185.11
Drainage (10%)	\$103,185.11
Design (10%)	\$103,185.11
Geotechnical (15% of Design)	\$15,477.77
Survey (15% of Design)	\$15,477.77
CEI (8%)	\$82,548.09
Contingency (15%)	\$154,777.67
<b>Total (Rounded to Nearest Thousand)</b>	<b>\$1,806,000.00</b>

# Recommendation and Conclusion

Through coordination with FDOT, an envelope has been preserved for the recommended alternative to cross I-95/SR 9A via changes to the ongoing FDOT D6 GGI Enhancement Project. More specifically, the study team proposed vertical profile changes of the Northbound Turnpike Express Ramp, Ramp V, Ramp T, and I-95 Northbound Mainline. Through a series of conceptual design reviews and revisions of the recommended bicycle and pedestrian bridge and proposed changes to Project FM Number 437053-4-52-01, the study team and FDOT were able to achieve a feasible concept. On January 6, 2022 FDOT reviewed the feasible concept presented on December 13, 2021 and agreed to proceed with revising the design of Project FM Number 437053-4-52-01 to accommodate the envelope for the recommended bicycle and pedestrian bridge. Changes to FDOT Project FM Number 437053-4-52-01 will be reflected on the 90% design plan submittal due May 2022.

**PAGE INTENTIONALLY LEFT BLANK**



# Golden Glades Multimodal Transportation Facility Bike & Pedestrian Eastside Connectivity Study

Refinement of Recommended  
Bike & Pedestrian Bridge Concept  
GPC-VII TWO#46

*prepared by: Gannett Fleming, Inc.*



*The Miami-Dade Transportation Planning Organization (TPO) complies with the provisions of Title VI of the Civil Rights Act of 1964, which states: No person in the United States shall, on grounds of race, color, or national origin, sex, age, disability, family, or religious status be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. It is also the policy of the Miami-Dade TPO to comply with all of the requirements of the ADA. For materials in accessible format, please call (305) 375-4507.*

*The preparation of this document has been financed in part from the U.S. Department of Transportation (USDOT) through the Federal Highway Administration (FHWA) and/or the Federal Transit Administration (FTA), the State Planning and Research Program (Title 23, U.S. Code §505), and Miami-Dade County, Florida. The contents of this document do not necessarily reflect the official views or policy of the USDOT.*