

SECTION 6.0 FINAL RECOMMENDED PLAN

ALTERNATIVE 7a: EXISTING ALIGNMENT WITH RAISED PROFILE AND 3000- FOOT BRIDGE WITHOUT WATER QUALITY TREATMENT.

6.1 DESCRIPTION

Alternative 7a incorporates bridge features of Alternative 2, Existing Roadway Alignment with Raised Profile and Four New Bridges without Water Quality Treatment, and Alternative 5, Elevated Roadway within Existing Right-of-Way without Water Quality Treatment. It is defined as modifying the existing Tamiami Trail profile and typical section at the beginning and end of the study corridor, and the construction of a bridge with a span of approximately 3,000 feet to convey MWD project flows. The bridge would begin approximately one mile from the western end of the corridor.

The existing Tamiami Trail profile and typical section would be modified for approximately one mile at the western end of the project and approximately 9.4 miles to the east of the bridge. Existing culverts would be retained. The centerline of this alignment would fall very close to the centerline of the existing facility. There are no significant alignment transitions required at either end of the segment, nor are there any significant impacts to parcels of concern along the corridor.

The bridge portion of this alternative is defined as reconstruction of approximately 3,000 feet of the Tamiami Trail alignment as an elevated structure. This alignment would be positioned to minimize impacts and construction cost, and to facilitate maintenance of traffic during construction. The profile would be established per the applicable drift, maintenance, and navigation bridge clearance. This alternative requires only a modest alignment transition at either end of the bridge. The new bridge deck would be equipped with drain scuppers that would discharge directly to the area below.

The existing Tamiami Trail embankment would be removed adjacent to the 3,000-foot-long bridge. The bridge typical section would be standard the entire length, with two travel lanes of 12 feet, two shoulders of eight feet, and outside barrier shapes. Exceptions would occur where a surface connection for access or other reasons might be required; at these locations, turning lanes might be needed.

6.1.1 Enhancements/Betterments

Items that are in addition to the project features are considered "enhancements" or "betterments." This section describes examples of each and how they could be incorporated.

Enhancement: Wildlife features. In the project Coordination Act Report from the Department of Interior, several features were recommended to reduce wildlife mortality along U.S. 41. These features are not required to meet the project purpose of water

deliveries to NESRS and are not features of the recommended plan. However, as enhancement features that would improve wildlife survival, the features can be recommended and funded by the Department of Interior.

The South Florida Water Management District may provide enhancements to the project for protecting and enhancing wildlife along the Tamiami Trail. Enhancements may include the construction of wildlife barriers to reduce wildlife mortality on the highway, and the incorporation of wildlife crossings for improving connectivity across the Tamiami Trail and the L-29 Canal. Enhancements such as wildlife crossings are outside the scope of this MWD project. However, if enhancements are desired to the recommended plan, they can be included at the request of DOI.

Betterment: Airboat Passage. Recreational interests have requested that the alternatives evaluated include bridging at a height that would allow for the passage of airboats. These features are not required to meet the project purpose of water deliveries to NESRS and are not features of the recommended plan. Currently there is no airboat passage between the north and south side of Tamiami Trail in this area. An airboat passage feature was not evaluated for purposes of this project. Such features may be considered later as betterments, if recommended and funded by the local sponsor, or an airboat passage feature may be considered with a later project.

6.1.2 Water Quality

Requirements for the treatment of highway runoff are determined by FDEP. As described in Chapter 62-25, FAC, *Regulation of Stormwater Discharge*, FDEP requires that all stormwater runoff be collected and directed to treatment facilities that meet specific design and performance standards. Facilities must provide retention, or detention with filtration, of the runoff generated by the first one inch of rainfall. As an option, for projects or project subunits with drainage areas less than 100 acres, facilities may provide retention, or detention with filtration, of the runoff generated by the first one-half inch of rainfall. However, facilities discharging directly to Outstanding Florida Waters (described in Chapter 17-3 FAC) shall provide additional treatment in accordance with Section 62-25.025(9) FAC. Additionally, retention or detention basins shall provide the capacity for the given volume of stormwater within 72 hours following the storm event. The additional storage volume must be provided by a decrease of water stored via percolation through soil, evaporation, or evapotranspiration.

Jurisdiction over water quality issues of this type is normally delegated by FDEP to the water management districts. Because SFWMD is a sponsor of the project, jurisdiction remains with FDEP.

In an evaluation of the effects of the proposed project on water quality, *Characterization of the Potential Impact of Stormwater Runoff from Tamiami Trail on the Neighboring Waterbodies* (Appendix F), it was concluded that there would be little effect from highway runoff on water quality or on surrounding aquatic habitat. Contaminant concentrations in runoff would be less than existing concentrations in canals. By the letter of February 18, 2002 (Appendix F), FDEP concurred with this finding, "...based on the expected minimal effects of stormwater runoff and mitigating situation regarding flow-way improvements and enhancements of wetlands from removal of the causeway fill, the Department has determined that stormwater treatment for the TTMWDP project is not required."

Erosion and sediment control best management practices must be used as necessary during construction in order to retain sediment on site. Controls shall be developed with respect to specific site conditions.

6.2 TYPICAL SECTIONS AND PAVEMENT DESIGN

6.2.1 Roadway Typical Section

This typical section would consist of two 12-foot-wide travel lanes, and 8-foot-wide shoulders on each side of the roadway. Five feet of this shoulder would be paved. There would be guardrail located at the outside edges of these shoulders.

6.2.2 Bridge Typical Section

The bridge typical section would provide two 12-foot travel lanes with 8-foot shoulders and outside barriers.

6.2.3 Pavement Design

This alternative would consist of upgrading the existing roadway to accommodate a design high water elevation of 9.3 feet and traffic for 50 years. This would be achieved through placing a thick structural overlay. The upgrade would consider the impact of the design high water elevation, overtopping, and grade variations.

The recommended approach is to leave the existing asphalt pavement in place as a construction platform and to serve as a black base. The low areas would be leveled to minimum elevation of 11.0 feet throughout the project. Then a 6-inch asphalt overlay would be placed on the surface. This provides slightly more than one foot of clearance to the 9.3-foot design high water elevation. In areas where the roadway profiles dip as low as 10 feet, the bottom of the existing 6-inch asphalt is essentially at the design high water level.

After leveling to elevation of 11.0 feet with asphalt overbuild, the top six inches below elevation 11.0 feet would be considered black base. Elevation 11.0 feet provides for one foot of clearance from the bottom of the declared black base (elevation 10.5 feet) using either existing granular embankment or asphalt overbuild. In many cases, the asphalt overbuild would be 12 inches thick, providing a total asphalt thickness of 18 inches for over a mile before the structural overlay is placed.

The FWD testing conservatively estimated the embankment modulus at 5,000 psi (the FDOT method would predict it at 15,000 psi); to account somewhat for the higher water level, the modulus was reduced to 4,000 psi. Using the 50-year projected traffic and an embankment resilient modulus of 4,000 psi, the required structural number is 6.17 inches. Using the effective AASHTO structural number of the existing pavement structure, S_{Neff} , of 3.5, a 6-inch asphalt overlay provides a structural number of 6.14. This is slightly less than the 6.17 required, which equates to 0.15 inches of asphalt. Considering this is a 50-year outlook and that there would be numerous periodic resurfacings, any additional thickness deemed necessary can be added with the resurfacings and considered a staged construction.

A key issue is that the roadway would be close to the design high water table, and that more frequent resurfacings are anticipated than a normal roadway. This is in part due to potential localized failures and some settlement of the muck. The buoyant force of the

raised water elevation almost counteracts the weight of the additional asphalt. However, in areas where more than 12 inches of asphalt are placed, settlements are expected. Similarly, if the water elevation seldom reaches 9.3 feet, then there is less buoyant force and additional settlement is expected.

Considering that the existing roadway was resurfaced seven years ago, and by its cracking condition of 6 is technically ready for a resurfacing, a 7-year resurfacing interval for this alternative appears warranted. This is considerably more frequent than a 10 to 15 year interval common in Florida; however, the Tamiami Trail is surrounded by the Everglades and exposed to water throughout the year. The recommended pavement section follows:

Alternative 7a - Without Water Quality Treatment
Centerline elevation = 11.5 feet
¾ inch friction course
6-inch structural asphalt
0-12 inch asphalt overbuild
Existing 6-inch asphalt pavement
Existing embankment

6.3 PLANS AND PROFILE

The profile is to be raised to provide a set clearance from the controlled high water elevation to the bottom of the roadway subgrade. The set clearance is to meet FDOT design criteria, as well as drainage criteria. The elevation at the crown of the roadway is 11.5 feet. The profile would be raised significantly at the bridge, and would be established per applicable drift, maintenance, and navigation bridge clearances, while minimizing humps in the profile.

6.4. STRUCTURES

The 43'-1" wide bridge typical section provides sufficient deck area for two 12-foot-wide travel lanes and 8-foot shoulders on both sides of the travel lanes. Several superstructure and substructure alternatives were evaluated to determine the most cost-effective bridge structure. These systems include:

Superstructure Alternatives	Substructure Alternatives
Transversely Post-Tensioned Slab Units	18 and 24 inch square Prestressed Concrete Piles (with pre-drilling)
FDOT Precast Prestressed Double Tee System	3-foot diameter Drilled Shafts
AASHTO Beams Types II, III, IV, V, and VI with Cast-in-Place Concrete Deck	
Florida Bulb Tees 72 and 78 with Cast in Place Concrete Deck	

The most cost-effective bridge structural system for all four bridges uses AASHTO Type V Beams with a composite cast-in-place concrete deck. The superstructure is supported on pile bents using two 3-foot-diameter drilled shafts.

Placement of cranes and delivery of material, such as piles, precast beams, and concrete were analyzed to ensure constructability of the bridge for this alternative. Installation of the drilled shafts and erection of the precast beams for the barges over the L-29 Canal would most likely be performed from barge-mounted cranes. Crane size and lifting capability may be limited based on the size of barges that can be transported to and placed in the canal.

The minimum offset of the centerline of the bridge from the centerline of the roadway was established at 26 feet to allow a minimum buffer area of five feet from the temporary barrier to the edge of the bridge, to allow the construction of temporary pavement without impacting the wetland, and to allow a minimum of 50 feet of canal width for barge operations. This offset could be increased by 10 feet to allow for a pullout lane for precast beam delivery. This offset cannot be increased sufficiently to allow for crane placement on the south bank for the canal without either filling part of the canal or impacting the wetlands by shifting the traffic farther south.

6.5 DRAINAGE

The new bridge deck would be equipped with drain scuppers that would discharge directly to the area below.

Existing culverts under the roadway would be retained.

6.6 UTILITIES

There are existing utilities within the corridor that would be affected by the new construction. There is a buried telephone facility running behind the guardrail on the south side of the roadway. There is also a 23 kilovolt overhead electric line running along the south side, located about 100 feet south of the existing guardrail. Just behind the guardrail on the north side of the roadway is an additional buried telephone facility.

All utilities within the typical section would require relocation. Utility relocations would be coordinated with each utility owner. As the underground utilities appear to fall within the right-of-way, their relocation costs are not included in the cost estimates.

6.7 ENVIRONMENTAL FACTORS

Because the roadway portion of this alternative preserves the existing facility, it has limited environmental effects. The alignment does not encroach beyond the existing footprint to the south. The two detour roads at either end of the bridge would temporarily fill 3.5 acres of wetlands that would be restored after construction of the transitions is completed.

This alternative offers the option of incorporating wildlife barriers and wildlife crossings.

6.8 MAINTENANCE OF TRAFFIC DURING CONSTRUCTION

6.8.1 Roadway Portion

Traffic is to be maintained as it exists today. The overlay of the existing roadway would be accomplished using a moving operation. Several staging area options have been identified, but usage has not been determined. Staging areas for construction equipment and materials could be located on the business parcels along the corridor that are to be acquired or are not actively used now. Otherwise, staging and other functions may need to utilize sections of the existing shoulder for temporary periods. It may be necessary to have a staging area near the east end of the corridor, with materials moved in the remaining short distance on an “as needed, just-in-time” basis at the work site.

6.8.2 Bridge Portion

In order to construct this alignment, the existing roadway would be shifted to the south. This shift would prevent any traffic flow to be allowed underneath the structure. Once temporary pavement is constructed on the southern shoulder, traffic can be shifted out from under the alignment. Construction staging would be done from a barge in the L-29 Canal, minimizing the impact to both the wetlands and the traffic.

Temporary barricades spaced every 50 feet would be placed at the south edge of the eastbound travel lane. In ¼-mile increments, the existing guardrail would be removed and replaced with temporary barrier wall. The existing shoulder would be removed and replaced with temporary pavement. Once completed for the entire project length, traffic is shifted to the south, utilizing the new pavement. A 10-foot-wide strip of temporary pavement would be placed north of the existing centerline to allow the roadway to slope to the north at 2 percent. A temporary concrete barrier would be placed at the north-south edge of the temporary pavement. The bridge would then be constructed.

A temporary roadway would be constructed south of the existing alignment in the transition areas only. Once the temporary roadway is completed, traffic would be shifted onto it and the transitions to the new bridge would be constructed. Traffic to the new bridge would then shift to the new alignment, and the existing roadway would be removed.

6.9 CONSTRUCTION AND LIFE CYCLE COSTS

The cost of this alternative is \$23,045,733. Most of the cost is related to the roadway elements (Table 34). All costs in this section include a Supervision and Administration factor that results in an increase of seven percent over costs listed in Table 31.

The life cycle costs for this alternative were developed for two cases: for the roadway alone, and for the total project. Pavement life cycle costs were calculated at \$16,961,032 while the total project life cycle costs were estimated to be \$31,003,830.

Table 34. Construction Costs of Alternative 7a

ALTERNATIVE 7- Without Water Quality Control	
Roadway	\$16,110,900
Bridge	\$6,934,834
Total	\$23,045,733

Source: PBS&J, 2001 (Engineering Appendix).

6.10 OPERATIONS AND MAINTENANCE

The project feature is a 3,000-ft wide conveyance channel through U.S. Highway 41, the Tamiami Trail. The local sponsor (SFWMD) will be responsible for maintenance of the conveyance channel and the conveyance aspects of the culverts as part of the project cost sharing agreement to insure that the project operates as designed. The 3,000-foot conveyance channel easement, use of the conveyance structures, and a flowage easement are the project features, which are needed for the project to function and are to be operated and maintained by the Non-Federal Sponsor. The substitute facilities will not be operated and maintained by the Federal or Non-Federal Sponsor. The substitute facilities for the final recommended plan consist of two items: (a) a 3,000-foot bridge and (b) pavement upgrades to the unbridged portion of Tamiami Trail road between S333 and S334.

Maintenance of the 3,000-ft conveyance will also require maintaining the L-29 canal from S-333 to S-334 free of aquatic weeds so that the bridge channel does not become blocked and reduces the conveyance. Control of aquatic weeds is fairly routine and can be accomplished for \$20,000 annually. Ensuring the culverts are free of aquatic vegetation through weed control is included in this cost. The Federal/Non-Federal cost share of this O&M is 75/25, respectively. Estimated costs are \$15,000 Federal and \$5,000 Non-Federal.

Features identified as public highway relocation and flowage easement compensation are a 3,000-ft bridge and the raising of the roadway. O&M for the bridge and resulting substitute facility is not the responsibility of the Non-Federal Sponsor because the compensation is the provision of the substitute facility. Responsibilities of the Non-Federal Sponsor are:

- a. For so long as the project remains authorized, operate and maintain, repair, replace, and rehabilitate the completed Recommended Plan or functional portion of the Recommended Plan in accordance with applicable Federal and State laws and specific directions prescribed by the Federal Government.
- b. Provide a cost share of 25 percent of the operation, maintenance, repair, replacement and rehabilitation of the Recommended Plan.
- c. Hold and save the Federal Government free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the Recommended Plan. In addition, the Federal Government will be free from all damages arising from any project related betterments, except for damages

due to the fault or negligence of the Federal Government or the Federal Government's contractors.

- d. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the Recommended Plan to the extent and in such detail as will properly reflect total project costs.
- e. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the Recommended Plan in a manner that will not cause liability to arise under CERCLA.
- f. Participate and comply with applicable Federal flood plain management and flood insurance programs in accordance with Section 402 of Public Law 99-662, as amended.
- g. Prevent future encroachments on the project lands, easements, and rights-of-way that might interfere with the proper functioning the Recommended Plan.
- h. Do not use Federal funds to meet the non-Federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.
- i. That as between the Government and the Non-Federal Sponsor that the Non-Federal Sponsor shall be the operator of the Project for purposes of the CERCLA liability.
- j. That the Non-Federal Sponsor shall investigate for hazardous substances as are determined necessary by the Government to identify the existence and extent of a hazardous substance regulated under the Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA), 42 USC 9601-9675, on lands being acquired by the Government for the construction, operation and maintenance of the Recommended Plan at the Government's expense.

6.11 OTHER ASPECTS

There are existing features that must remain undisturbed. The Flight 592 Memorial is located north of the L-29 Canal near the western limits of the project and would not be impacted with this alternative. Access would remain at the S-333, S-334, and S-336 structures. Access to Tigertail Camp, located on the north side of the canal, would remain. Connecting roads would be provided for access to the Florida Airboat Association site. Access to the Osceola Camp would be by way of a connecting road from the west.

Wildlife Features. In the final Coordination Act Report (Appendix I) from the Department of Interior, several features were recommended to reduce wildlife mortality along U.S. 41. These features are not required to meet the project purpose of water deliveries to NESRS and are not features of the recommended plan. However, as an enhancement feature that would improve wildlife survival, the features can be recommended and funded by the Department of Interior.

Airboat Passage. Recreational interests have requested that the alternatives evaluated include bridging at a height that would allow for the passage of airboats. These features are not required to meet the project purpose of water deliveries to NESRS and are not

located north of the L-29 Canal near the western limits of the project and would not be impacted with this alternative. Access would remain at the S-333, S-334, and S-336 structures. Access to Tigertail Camp, located on the north side of the canal, would remain. Connecting roads would be provided for access to the Florida Airboat Association site. Access to the Osceola Camp would be by way of a connecting road from the west.

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Airboat Passage. Recreational interests have requested that the alternatives evaluated include bridging at a height that would allow for the passage of airboats. These features are not required to meet the project purpose of water deliveries to NESRS and are not features of the recommended plan. Currently there is not airboat passage between the north and south side of Tamiami Trail in this area. An airboat passage feature was not evaluated for purposes of this project. Such a feature may be considered later as betterments, if recommended and funded by the local sponsor.

6.12 SCHEDULE

The duration of construction of the Final Recommended Plan is 24 months.

6.13 COST SHARING

A Project Cooperation Agreement (PCA) will be required between the Corps of Engineers and the local sponsor. The PCA is a legally binding document between the Federal government and the local sponsor identifying the sponsor duties and obligations for this project. However, in accordance with current Federal policy, the PCA cannot be executed until construction funds for the project have been appropriated. The SFWMD is the project sponsor and represents local interests.

Because Section 104(a)(3) of the Everglades National Park Protection and Expansion Act authorized construction of the project based on "the environmental benefits to be derived by the Everglades ecosystem in general and by the park in particular," all first costs shall be 100 percent Federal including the value of lands, easements, rights of way, and relocations provided for construction of the project. Operation and Maintenance (O&M), Repair, Replacement and Rehabilitation (RR&R) costs shall be not more than 75 percent Federal. These costs are consistent with staff agreements previously reached between the Office of Management and Budget and the Assistant Secretary of the Army (Civil Works).

Acquisition of lands for ENP expansion shall be in accordance with PL 101-229 and cost-shared between the Department of the Interior and the State of Florida.

The specific requirements of local cooperation will be prescribed by the MWD PCA and will comply with the following general guidelines:

- Maintain and operate the works after completion in accordance with regulations prescribed by the Secretary of the Army, except for the water control structures and outlets in Water Conservation Area No. 3, which will be maintained and operated by the Corps of Engineers.

6.14 REAL ESTATE

The Federal government will compensate FDOT for the real estate rights needed for the Tamiami Trail project. In order to obtain the perpetual right to flow water, FDOT is entitled to compensation. This right includes both conveyance and easement interests. The appropriate organizations at the Federal and State levels will develop and approve an agreement containing the details and method of implementation. It is the intention of the Federal government not to expend any more funds than necessary to construct alternate facilities for the Tamiami Trail that a future project under CERP may impact.

6.14.1 Lands and Easements

The lands and easements needed to implement the Tamiami Trail modifications are currently under several ownerships. A complete copy of all real estate requirements and issues is included in Appendix H.

The footprint of Alternative 7a falls within the maintenance right-of-way of the existing roadway and ownership is claimed by FDOT. This ownership claim is partially overlapped by SFWMD's right-of-way claim along the L-29 Canal. This apparently is fairly common when a roadway parallels a canal, and in the past has been resolved through the exchange of quick claims between agencies to establish a contiguous right-of-way boundary shared by the two agencies. In some areas, SFWMD holds only flowage easements and fee title is held by approximately two dozen private landowners. Most of the private holdings involve large tracts, but a few are as small as two acres.

6.14.2 Construction Relocations

No relocations (as described in Public Law 91-646) will be required for Alternative 7a as the footprint is generally within the existing right-of-way claims of FDOT. The footprint will require obtaining fee title ownership from private owners, but will not affect any residential or business improvements. No relocation payments, as specified under the provision of Title II of Public Law 91-646, The Uniform Relocation Assistance, and Real Property Acquisition Act of 1970, will be required.

6.14.3 Public Highways and Bridges

There are no additional non-project-related relocations of public highways or bridges affected by the alternatives under consideration.

6.14.4 Utilities Relocation

There are utilities within the existing corridor that may be affected by construction. There is a buried telephone facility behind the guardrail on the south side of the road and a 23 kilovolt overhead electric line running along the south side, approximately 100 feet south of the existing guardrail. Just north of the guardrail on the north side is an

additional buried telephone facility. There are utilities along the L-29 Levee: a buried telephone cable at the base of the levee on the south side and power poles on the canal maintenance berm.

6.15 PROJECT IMPLEMENTATION

The Draft GRR/SEIS for Tamiami Trail was provided to the staff of the non-Federal sponsor, SFWMD, and a Notice of Availability was published in the Federal Register on 7 December 2001. The formal public comment period for the Draft report for the NEPA process was 45 days. The purpose of issuing the Draft document was to present the results of the study and gather comments/concerns from the sponsor and from agencies and the public. The following steps will take place for full implementation of the selected plan.

- The Draft GRR/SEIS was provided to the staff of the non-Federal sponsor, SFWMD, and a Notice of Availability was published in the Federal Register on 7 December 2001.
- There was a 45-day public comment period on the Draft GRR/SEIS beginning on December 7, 2001. Comments were received from Federal and State agencies and other parties, as indicated in the comment matrix. The non-Federal Sponsor provided comments through the State Clearinghouse process. The draft report/DEIS has been revised in accordance with internal and public review and has been updated.
- The Final GRR/SEIS (consisting of the Draft Report, incorporated by reference, and this document) will be available for comment for a period of 30 days. Availability will be noticed in the Federal Register; the comment period will begin upon the date of FR publication. Additionally, the documents will be posted on the Jacksonville District, US Army Corps of Engineers Environmental website during the comment period.
- After the close of the comment period for the Final GRR/SEIS, approximately 30 days will be required to compile responses to comments and prepare the draft Record of Decision. The non-Federal sponsor will present the Final GRR/SEIS to the SFWMD Governing Board. The Governing Board is expected to issue a letter indicating support if they accept the project.
- The ROD package, consisting of the FGRR and FEIS, comments, responses, District recommendations, and draft ROD, will be transmitted to the Division Engineer, who will sign the ROD. As a matter of routine, the US Army Corps of Engineers will notify interested parties (generally, commenters on the FEIS) when the ROD is signed, and include a photocopy of the ROD in the letter of notification.
- Once the Record of Decision is signed, a Project Cooperation Agreement Amendment will require approximately 120 - 180 days for execution with the non-Federal Sponsor, SFWMD.

If the recommended plan is approved, design and construction would be complete approximately 4 years following signing of a Record of Decision.

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