

Confirmation of Previous Analyses of the Tamiami Trail Next Steps Final EIS, Addressing Modifications to the Authorized Plan, Based on Recommendations from a 2018 Phase 2 Value Analysis Workshop

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1. Executive Summary

The National Park Service, Florida Department of Transportation, and the Federal Highway Administration have collaborated on the Tamiami Trail Next Steps Project, to construct up to 5.5-miles of bridges and reconstruct the remaining unbridged roadway. This project will improve water conveyance, marsh connectivity, and sheetflow into the Northeast Shark River Slough (SRS) of Everglades National Park (ENP). The Phase 1 project included 2.3-miles of western bridging, beyond the 1-mile eastern bridge constructed by the Modified Water Deliveries (MWD) Project, and will be complete by March 2019. To begin Phase 2 planning, the NPS sponsored an inter-agency Value Analysis workshop, to develop the most environmentally responsible and cost effective plan to achieve the original project objectives.

Re-evaluation of the original hydrologic benefits for the Tamiami Trail Next Steps Project determined that the existing 3.3 miles of bridging (MWD and TT:NS Phase 1) represents an optimal bridging plan, and provides sufficient water conveyance capacity to pass future Comprehensive Everglades Restoration Plan (CERP) flows. Stopping the project without reconstructing/raising the remaining 6.5-miles of roadway would constrain water levels in the adjacent L-29 Canal, limiting future restoration benefits in both the upstream Water Conservation Areas and ENP. The NPS's Choosing by Advantages analysis reiterated that the Original Plan from the 2010 Final EIS, with 6.5-miles of total bridges, scored better on key ecological objectives, such as restoring sheetflow, and reducing wildlife mortalities, but only slightly better on marsh connectivity, and recreating marsh flow velocities.

The VA workshop recommended a Phase 2 Alternative, with no additional bridging beyond the existing 3.3-miles of bridges, adding six 72-foot wide pre-cast concrete culverts, reconstructing the roadway, and adding swales for water quality treatment. This alternative scored higher for reconnecting historic sloughs, and achieved the original project objectives for unconstrained water flows, marsh connectivity, restoring sheetflow, and recreating marsh flow velocities, given the expected limitations of removing less of the upstream L-29 Levee, based on the Army Corps Central Everglades Planning Project (CEPP) recommended plan. The Phase 2 alternative would have 6.8 fewer acres of permanent wetland impacts compared to the 2010 Original Plan. Seventeen threatened and endangered (T&E) species were evaluated in this analysis, with ten that were newly listed and/or not evaluated in the 2010 Final EIS. The Wood stork and the Florida panther have "Likely to Adversely Affect" determinations, but the reduced wetland losses would protect more T&E species habitat. The cultural resource impacts to the Tamiami Trail roadway would be less than the Original Plan, since 2.8-miles of bridging would not occur. There would be no direct impacts to historic structures, but adjacent entrance roads and parking areas would be adversely affected while they are reconstructed to match the raised roadway.

Life Cycle Costing analyses determined that replacing 2.8-miles of bridging with six large culverts, and other recommended modifications, lowers the total project cost by more than \$118 million, while achieving 78% of the maximum benefits. The Phase 2 recommended alternative includes improvements that will maintain roadway stability during high water events, and increase driver safety throughout its 100-year roadway lifespan. The Phase 2 recommended alternative also shortens the construction duration by 1.5 years, ensures a higher quality of life for rural and tribal communities, and provides reliable access to economically and culturally important sites.

2. Need for Confirmation of Previous Analyses

This report is a confirmation of the previous analyses included in the 2010 Final Environmental Impact Statement (EIS) for the Tamiami Trail: Next Steps Project (TT:NS project), which recommended 5.5-miles of total bridging and reconstruct the remaining roadway to improve water conveyance, marsh connectivity, and sheetflow into Northeast Shark River Slough (SRS). The Phase 1 project included 3.3-miles of total bridging, and will be complete in early 2019. This re-analysis involves recommended modifications at the start of Phase 2, that were developed during a National Park Service sponsored Value Analysis (VA) workshop held in July 2018. The proposed change during Phase 2 would substitute construction of three previously approved bridges (of 0.38 miles, 0.66 miles and 1.77 miles), with six 72-foot wide pre-cast concrete culverts at six existing culvert locations. The remaining roadway would be reconstructed and raised, and the culverts replaced in-kind. This Phase 2 Recommended Plan (Alternative 2) contains elements that are the same or very similar to elements described in the preferred and other alternatives that were analyzed in detail in the 2010 Final EIS. The combined Phase 1 and Phase 2 components meet all of the original project objectives from the 2010 Final EIS, and have similar or less adverse impacts than the Original Plan. This 2018 re-analysis confirms that the Phase 2 recommended alternative, that would complete the TT:NS project, is consistent with the benefit analyses and impact determinations included in the 2010 Final EIS.

For purposes of reference, the recommended plan in the 2010 Final EIS is referred to as the Original Plan. Modifications recommended in a prior 2014 re-analysis and its associated Memo To File (resulting from a December 2013 VA workshop), are referred as the First Modified Alternative. Modifications recommended in a prior 2015 re-analysis and its associated Memo to File (reflecting new water quality requirements by the Florida DEP) are referred as the Second Modified Alternative. The modifications recommended in with this 2018 re-analysis and its associated Memo To File (resulting from a July 2018 Value Analysis workshop) are referred as the Third Modified Alternative.

3. Background

Tamiami Trail Modifications: Next Steps Project

Tamiami Trail is a 264-mile historic roadway completed in 1928, and the eastern portion has long been considered an obstruction to water flow through the Everglades. The 2009 Omnibus Appropriations Act directed the Army Corps of Engineers (Army Corps) to immediately construct the features in a 2008 Modified Water Deliveries to ENP, Tamiami Trail: Limited Reevaluation Report, which included a 1-mile eastern bridge and partially raising the remaining roadway to accommodate an L-29 Canal design high water of 8.5 feet (NGVD). The same 2009 Act directed the NPS to evaluate bridging alternatives for the 10.7-mile eastern section of the Tamiami Trail (US Highway 41) roadway, beyond what was authorized by the Army Corps 2008 Modified Water Deliveries to ENP, Tamiami Trail: Limited Reevaluation Report (LRR), in order to “restore more natural water flow to Everglades National Park and Florida Bay and for the purpose of restoring habitat within the Park and the ecological connectivity between the Park and the Water Conservation Areas.”

The Final EIS for the TT:NS project was completed in November 2010, and a Record of Decision (ROD) was published in April, 2011. Six Alternatives with various bridging and roadway reconstruction options were evaluated (Figure 1). The recommended Alternative

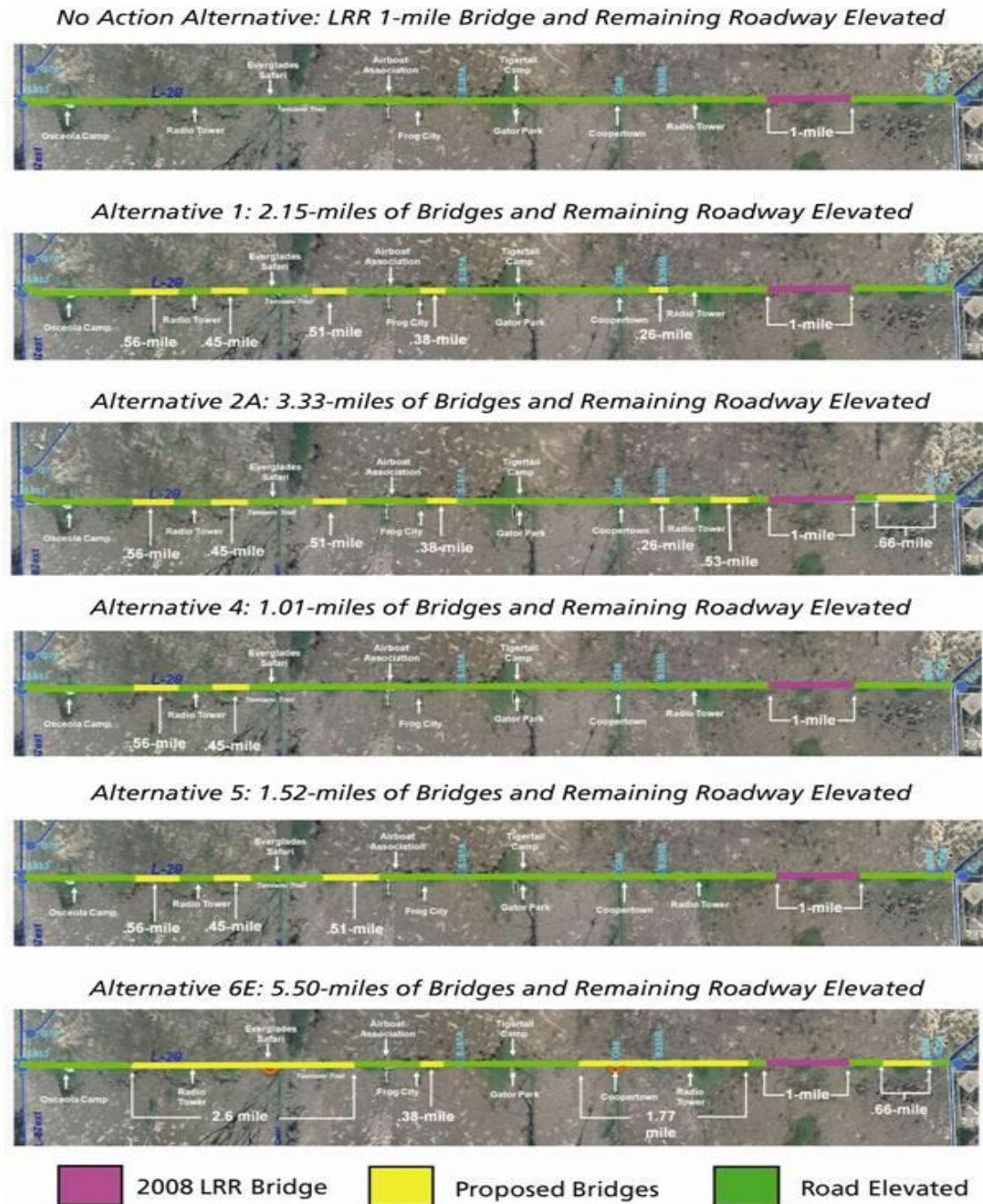


Figure 1. Final suite of alternatives evaluated in the 2010 Tamiami Trail Next Steps Final EIS. The No Action Alternative is the 2008 MWD/LRR Plan. The Action Alternatives in the 2010 FEIS have additional bridges (from 1.0 miles to 5.5 miles), reconstructing/raising the remaining roadway, and replacing culverts in-kind.

(6e), included 5.5-miles of additional bridging, reconstructing/raising the remaining roadway to accommodate and L-29 Canal design high water (DHW) of 9.7 feet NGVD, to achieve the 2009 Omnibus Appropriation Act's restoration objectives.

The 2010 Final EIS Alternatives and Recommended Plan

The six alternatives considered in the 2010 Final EIS are described below. Alternative 6e was defined as the environmentally preferred alternative, and was also the recommended plan. All of the action alternatives reconstruct and raise the remaining Tamiami Trail roadway three feet, to achieve an L-29 Canal design high water (DHW) of 9.7 feet NGVD, which accommodates future CERP flow requirements. The bridges would be constructed 50-feet south of the roadway, and the remaining culverts would be replaced in-kind.

1. **No-Action Alternative:** The Modified Water Deliveries Plan, with a 1-mile eastern bridge and partial roadway raising, to an elevation of 10.0-10.5 feet, to achieve the L-29 Canal DHW of 8.5 ft (all work completed by the US Army Corps of Engineers in 2013).
2. **Alternative 1:** 2.2 miles of additional bridging, roadway reconstruction to an elevation of 13.13 feet.
3. **Alternative 2a:** 3.3 miles of additional bridging, roadway reconstruction to an elevation of 13.13 feet.
4. **Alternative 4:** 1.0 mile of additional bridging, roadway reconstruction to an elevation of 13.13 feet.
5. **Alternative 5:** 1.5 miles of additional bridging, roadway reconstruction to an elevation of 13.13 feet.
6. **Alternative 6e:** 5.5 miles of additional bridging, roadway reconstruction to an elevation of 13.13 feet.

Tamiami Trail Modifications: Next Steps Phase 1

On December 23, 2011, Congress passed the Consolidated Appropriations Act of 2012 (Public Law 112-74) which authorized construction of Alternative 6e of the TT:NS project. In October 2012, NPS Director Jonathan Jarvis directed NPS staff at the Denver Service Center (DSC) and ENP to begin Phase 1 implementation. Phase 1 of the Original Plan (Alt. 6e) included the western 2.6-mile bridge and adjacent roadway approaches (Figure 2).

In early 2013 the NPS developed a conceptual design and initial cost estimate of \$180 million for Phase 1, to construct 2.6-miles of bridging and roadway improvements adjacent to Everglades Safari Park. In late 2013, Florida Governor Scott pledged up to \$90 million of Florida Department of Transportation (FDOT) funding, and the NPS and Federal Highway Administration (FHWA) committed to matching that funding up to \$90M. The NPS submitted a preliminary engineering design to the FDOT in October 2014. The FDOT agreed to manage project construction, and a Memorandum of Agreement (MOA) between the FDOT, the NPS, and the FHWA was signed in early 2015. The FDOT advertised a design/build project in June 2015 (which included the 2013 VA recommendations and additional design refinements with further cost savings). FDOT issued a construction contract to Condotte America for just over \$97 million in June 2016, followed by a notice to proceed in August 2016.

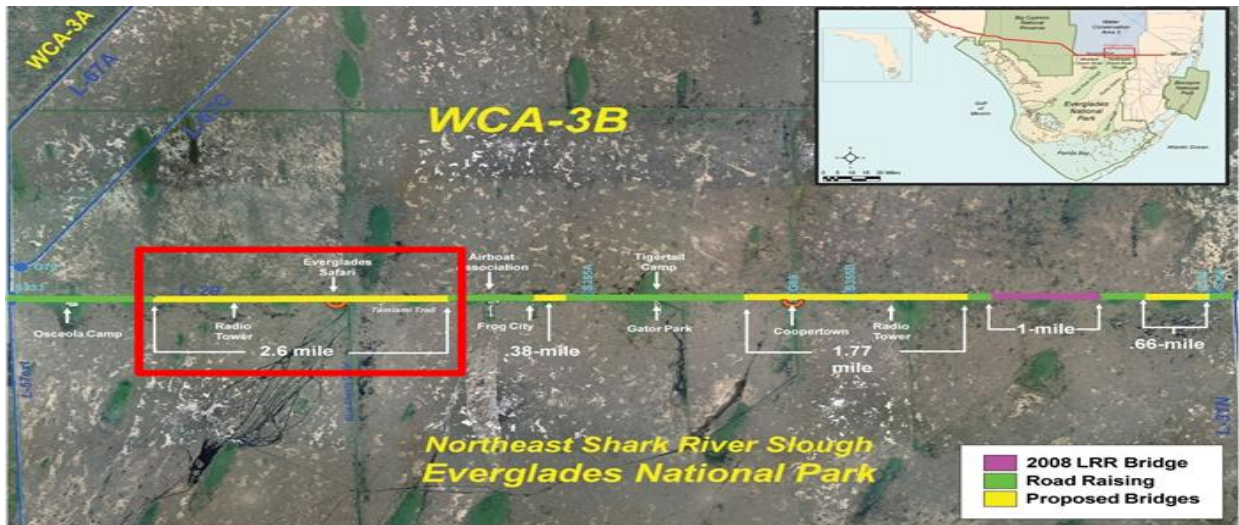


Figure 2. The Next Steps recommended plan (6e), with the Phase 1 study area (red box), which includes the Original Plan’s western 2.6-mile bridge and associated approaches.

The Tamiami Trail Next Steps Phase 1 project area extended just over 3 miles. The First Modified Alternative replaced the 2.6-mile bridge with two bridges and a short transition road. This reduced the wetland impacts, while improving access to Everglades Safari Park (Figure 3). The Phase 1 eastern bridge (with 0.88-miles of decking) was completed in April 2018, and the western bridge (with 1.43-miles of decking) was completed in October 2018. Associated roadway reconstruction covered 0.71-miles, including the western/eastern bridge approaches and the bridge transitions at Everglades Safari Park. The new roadway sections have been raised from approx. 10.0-10.5 feet to 13.1 feet (NGVD), to accommodate the future CERP design high water (DHW) requirement of 9.7 feet in the adjacent L-29 Canal. Removal of the original (abandoned) Tamiami Trail roadway at the eastern bridge began in October 2018. All of the remaining Phase 1 work is expected to be complete by late February 2019.

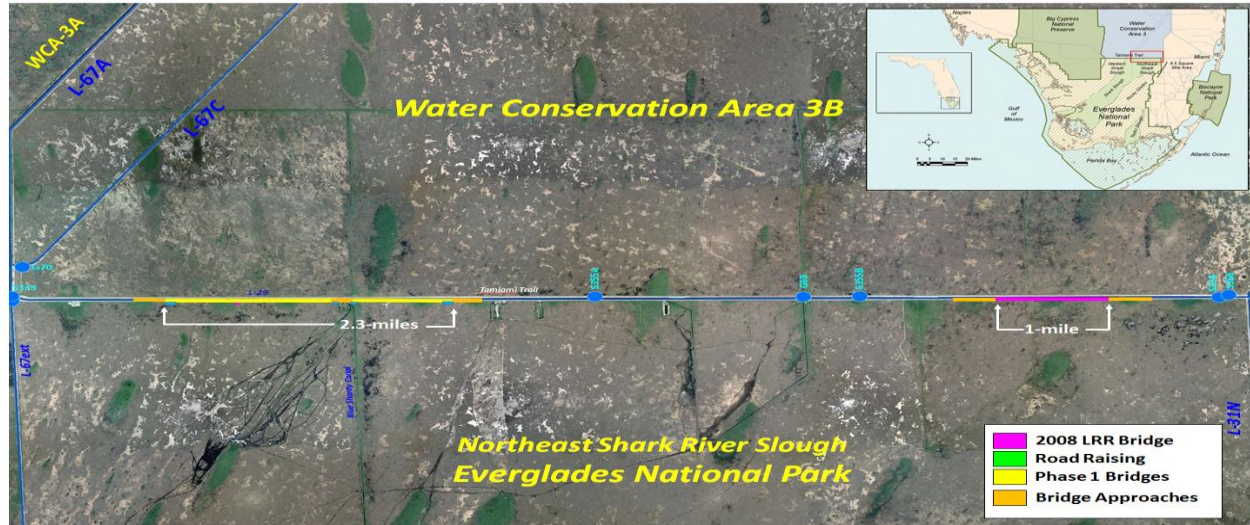


Figure 3. The Next Steps Phase 1 project, as constructed. Two bridges totaling 2.3-miles replaced the Original Plan’s western 2.6-mile bridge.

Changing Design Considerations for TT:NS Phase 2 Implementation

As the NPS began the Tamiami Trail Next Steps Phase 1 process in 2013, the Army Corps had just initiated a new CERP planning effort, referred to as the Central Everglades Planning Project (CEPP). The CEPP focused on improving upstream marsh connectivity as well as redirecting Lake Okeechobee regulatory releases southward into the central and southern Everglades. The NPS worked to assure that the TT:NS Phase 1 design was fully compatible with the water conveyance features envisioned within the CEPP.

The original water conveyance, marsh connectivity, and sheetflow enhancement approach in the 2000 CERP FEIS was expansive, including removal of the lower 7-miles of both the L-67A and L-67C levees, backfilling their adjacent canals, and removing all 10.7-miles of the L-29 Levee and backfilling the L-29 Canal. The CEPP recommended plan is more constrained, replacing the L-67A Levee removal with one existing and two new gated water control structures, greatly limiting WCA-3A/3B marsh connectivity and sheetflow. The CEPP plan would also remove a much smaller portion of the lower L-67C levee and adjacent L-67C Canal, and reduce the L-29 Levee removal to the 3-miles directly aligned with the TT:NS Phase 1 bridging (Figure 4).

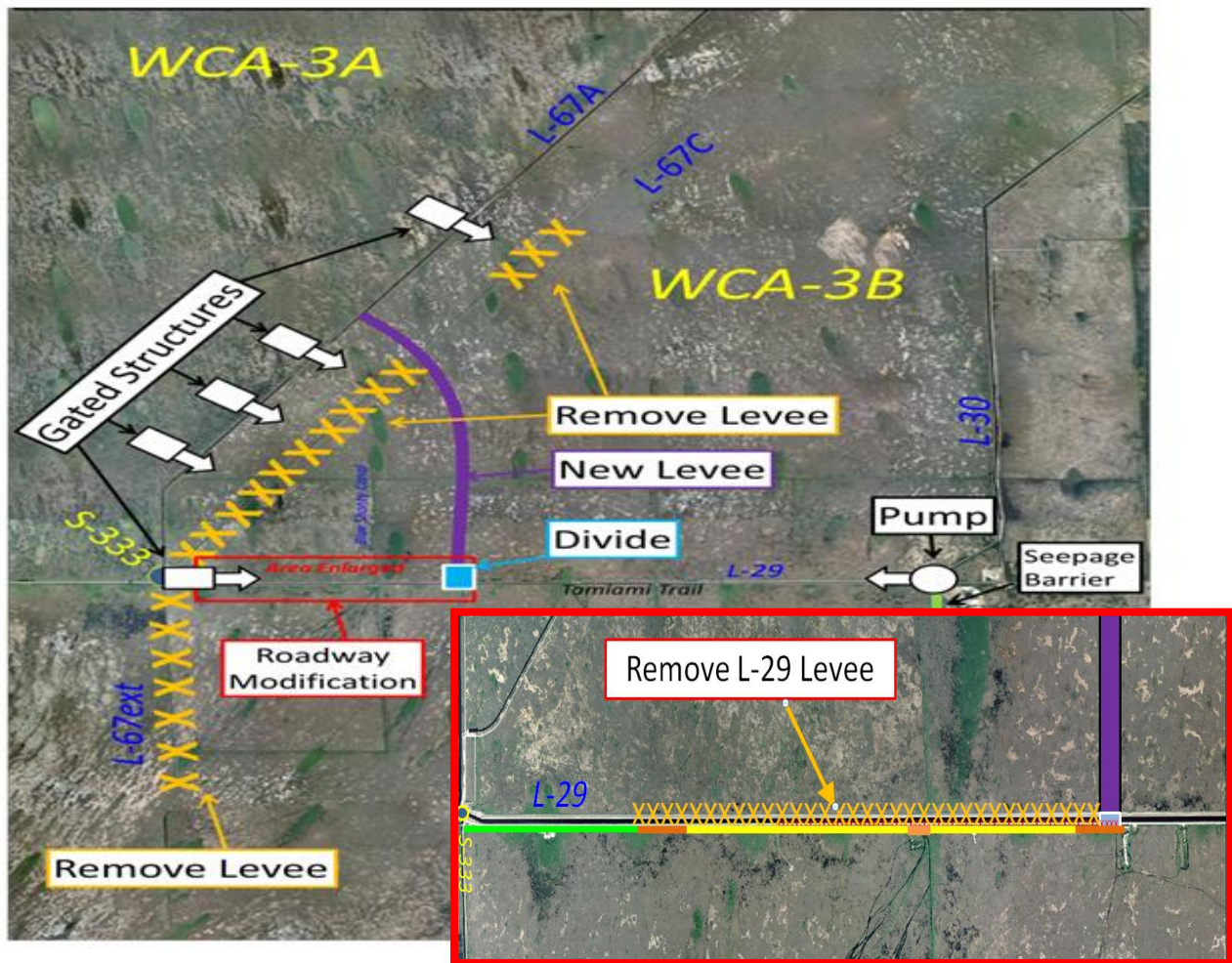


Figure 4. Conceptual components of the Central Everglades Planning Project. The inset map shows the alignment of the Tamiami Trail Next Steps Phase 1 bridging, with the proposed the L-29 Levee removal.

While this recommended CEPP design works well with the TT:NS Phase 1 bridging and roadway improvements, it will limit opportunities to achieve the broader sheetflow and marsh connectivity benefits envisioned in the 2009 Omnibus Appropriations Act (i.e. WCA-3B & Northeast SRS will largely remain disconnected). The CEPP recommended plan would create a new “Blue Shanty” flow-way by replacing the L-67C levee with a new L-67D levee (see the Army Corps 2014 Project Implementation Report and Final EIS for more details). Two new L-67A gated structures would be added to an existing structure to route water from southeastern WCA-3A, through a portion of southwestern WCA-3B, then across the L-29 Canal and into the Northeast SRS wetlands, via a 3-mile degraded section of the L-29 Levee (see Figure 4 insert).

4. Documents and Legislation Pertinent to Confirmation of Previous Analyses

This third re-evaluation of the TT:NS project builds on the Congressional Directives and prior analyses and actions that have been undertaken by both the National Park Service and the U.S. Army Corps of Engineers. These include a series of legislative actions, planning studies, land acquisition, and ecosystem restoration projects in the southeastern Everglades:

- *1989 Everglades National Park Protection and Expansion Act (Public Law 101-229).*
- *Land Protection Plan Environmental Assessment, East Everglades Addition, NPS/Everglades National Park (1991.)*
- *Army Corps Final Revised General Reevaluation Report/Second Supplemental Environmental Impact Statement (RGRR/SEIS): Tamiami Trail Modifications, Modified Water Deliveries to ENP Project (2005).*
- *Army Corps Modified Water Deliveries to Everglades National Park Tamiami Trail Modifications Final Limited Reevaluation Report and Environmental Assess. (2008).*
- *2009 Omnibus Appropriations Act (March 10, 2009).*
- *2012 Consolidated Appropriations Act (Public Law 112-74).*
- *Memo to File and Supplemental Assessment for Lincoln Financial Media and Salem Communications Radio Tower Facilities Located in the East Everglades Expansion Area of Everglades National Park (June 2012).*
- *Final General Management Plan / East Everglades Wilderness Study / Environmental Impact Statement for Everglades National Park (August 2015).*
- *Value Analysis Final Report for 2.6-Mile Tamiami Trail Bridge, NPS (December 2013).*
- *Memo To File and Supplemental Assessment based on the Recommendations of the Value Analysis Workshop, 2.6-Mile Tamiami Trail Bridge, NPS (May 2014).*
- *Memo to File and Supplemental Assessment based on Regulatory Requirements of the Florida Department of Environmental Protection, Tamiami Trail Next Steps Project, NPS (March 2015).*
- *Value Analysis Final Report, Tamiami Trail: Next Steps Phase 2, Roadway and Conveyance Improvements, NPS (September 2018).*

5. 2018 Value Analysis Recommended Modifications and Consistency with Alternatives Evaluated in the 2010 Final EIS

The CEPP Recommended Plan Prompts a Re-evaluation of TT:NS Phase 2

The hydrologic and ecological benefits of additional Tamiami Trail bridging (beyond the 3.3-miles completed in the MWD/LRR and TT:NS Phase 1 projects) are linked to the extent of upstream L-29 Levee removal. Since the recommended CEPP alternative limits this levee removal to the 3-miles adjacent to the Phase 1 bridging, we will not achieve the broader sheetflow and marsh connectivity benefits envisioned in the 2009 Omnibus Appropriations Act.

Following the CEPP Congressional authorization in late 2016, the NPS began a reevaluation effort to identify the most environmentally beneficial and cost effective approach to complete the Tamiami Trail Next Steps project. The Focus was on two areas: (1) the benefits from additional Tamiami Trail bridging, and (2) the best approach to reconstruct the remaining ~6.5-miles of the roadway. A key requirement is dealing with the organic-rich material below the roadway sub-base (i.e. Everglades peat that was not addressed during the MWD partial roadway raising). Since the roadway will be raised by approximately 3 feet to accommodate the CERP 9.7 feet NGVD design high water criteria, the NPS examined options for removing or stabilizing the organic material to prevent future roadway instability under high water conditions, when the sub-base will be saturated.

a. Evaluating the Hydrologic Benefits of Additional Bridging

The Army Corps previously performed hydrologic modeling evaluations to determine the benefits of increased Tamiami Trail bridge lengths, using the Hydrologic Engineering Center's, River Analysis System (HEC-RAS). This modeling analysis was performed over a range of flow return periods (see Appendix A of the 2005 MWD RGR/SEIS for the details). The Corps focused on the predicted flow conditions during an average (1-year) and an extreme wet (100-year) flow return frequency. This analysis demonstrated that the key hydrologic benefit of larger bridge spans, comes from reducing the stage differential between the L-29 canal and the downstream Northeast SRS marsh. Meaning that larger bridges are more hydraulically efficient at moving water, under both average and extreme wet conditions (Figure 5).

Larger bridge lengths lower the L-29 stage differential, allowing us to pass the same flow rate at lower L-29 Canal stages. Conversely, smaller bridges require higher L-29 stages to pass the same flow rate. From an environmental impact perspective, passing higher flows at a lower L-29 Canal stage, reduces the risk of adverse upstream flooding. Larger bridge openings also decrease the water flow velocity, thereby reducing soil erosion/resuspension. The Army Corps 2005 HEC-RAS modeling evaluated 16 different combinations of bridge span length and location (to match downstream topographic conditions). Their modeling results led the Corps to recommend the combination of a 2-mile western and 1-mile eastern bridge (approximately 15,900 linear feet of bridging). This combination of bridge length and location was considered optimal in terms of the canal to marsh stage differential and overall flow distribution, minimized the adverse impacts on cultural resources and wetlands, while reducing overall project cost. This Army Corps recommended 2+1 mile combination of bridging length and location, closely matches the existing MWD/LRR and TT:NS Phase 1 bridging features.

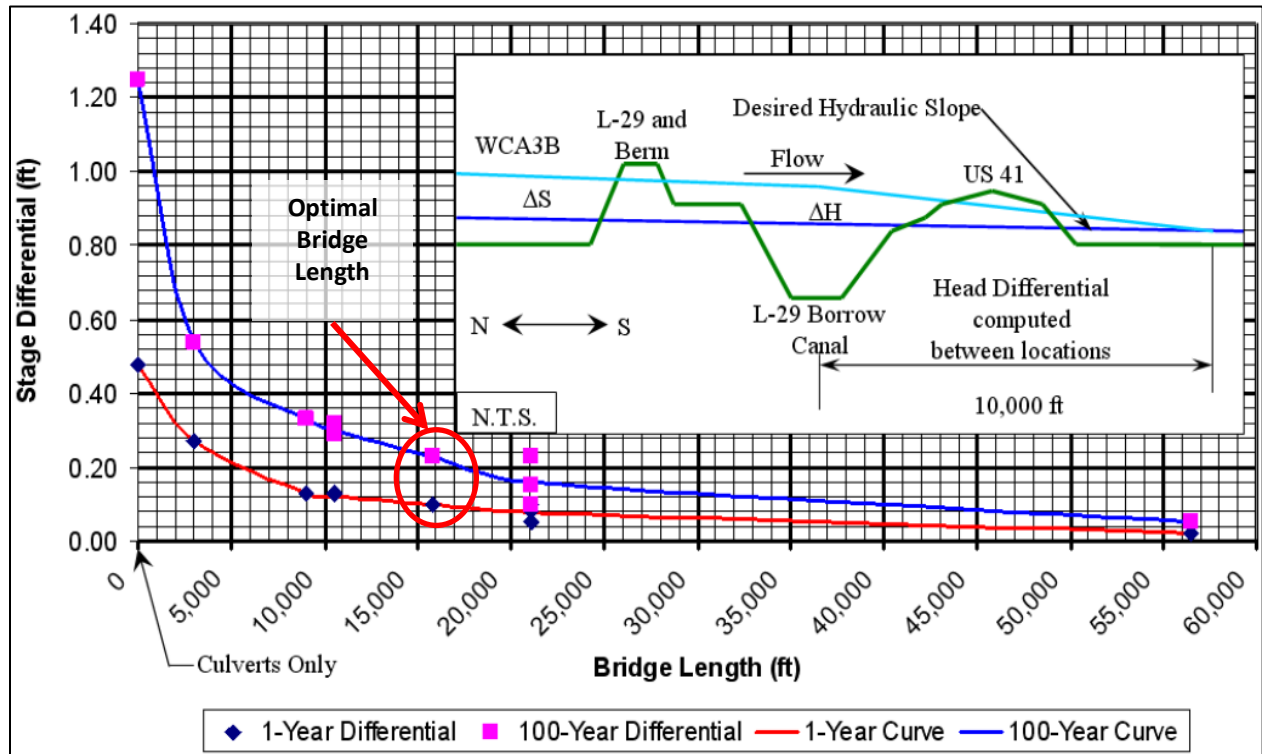


Figure 5. Comparison of the stage differential between the L-29 Canal and 10,000 feet south in the downstream marsh, versus Tamiami Trail bridge lengths. Average flow conditions are represented by the red line (inflows of 1,000 cfs), while extreme wet conditions are represented by the blue line (inflows of 4,000 cfs).

b. Evaluating Options for Roadway Reconstruction

In early 2017 the NPS began discussing options for Phase 2 roadway reconstruction with the Federal Highway Administration’s Eastern Federal Lands Highway Division (FHWA/EFLHD). In late 2017, the NPS contracted with the EFLHD to identify preliminary roadway design options to reconstruct the western 1.1-mile section of the roadway west of the TT:NS Phase 1 project area. An initial Engineering Study Report was prepared by the FHWA/EFLHD in February 2018. The NPS used this initial engineering study to develop a Phase 2 plan for the remaining un-bridged sections of the roadway. During this same time period the NPS began discussions with the State of Florida, to determine their interest in cost sharing on the TT:NS Phase 2 project. In March 2018, the Florida DOT completed its own initial project design and cost estimation effort for reconstructing the remaining ~6.5-miles of the eastern Tamiami Trail roadway. At the same time, the NPS began Phase 2 discussions with the Miccosukee Tribe of Indians, the Florida DEP, the Army Corps, and several non-governmental organizations.

The NPS hosted a Value Analysis workshop in July 2018 to bring together state and federal technical experts to develop possible alternatives, and recommend the best path forward for the TT:NS Phase 2 planning process. The NPS made a presentation in late July on a proposed Phase 2 approach to the South Florida Ecosystem Restoration Task Force in Washington DC. In late October 2018, Florida Governor Rick Scott announced a \$43.5 million state commitment to support the TT:NS Phase 2 project, as part of the ongoing Everglades restoration partnership.

Recommended Modifications to the Original Plan for Tamiami Trail Next Steps Phase 2: Based on the July 2018 Value Analysis Workshop

The Phase 2 Value Analysis workshop was held on July 10-11, 2018. Staff from the NPS/DSC, NPS/ENP, Florida DOT, Florida DEP, and consultants from HDR Engineering, AECOM, and Kirk Associates participated in this re-evaluation effort (FHWA staff contributed their ideas in a prior interagency meeting). The workshop reviewed the original project objectives from the 2010 Final EIS, and examined additional roadway design improvements, to determine the best approach to meeting these objectives, in light of the CEPP changed approach to sheetflow and marsh connectivity.

The team began by revisiting the specific hydrologic and ecological objectives that were developed by the NPS and the interagency project delivery team, and included in the 2010 Final EIS:

Restore More Natural Water Flow to ENP:

1. Construct additional bridging and road raising of the Tamiami Trail to provide for unconstrained flows to Northeast Shark River Slough and Florida Bay.

Restore Ecological Connectivity (Between WCA-3B and Northeast SRS):

1. Improve ecological connectivity by removing obstructions to sheet flow.
2. Enhance unobstructed movement of animals between the north and south of Tamiami Trail (reduce wildlife mortality).

Restore Habitat Within Everglades National Park:

1. Restore slough vegetation and the deep water sloughs within ENP.
2. Restore processes that produce and maintain ridge and slough communities in ENP east of the L-67 Extension (match natural marsh flow velocities).

The remaining un-bridged portion of the roadway covers approximately 6.5-miles. The TT:NS Phase 2 plan will therefore have a larger proportion of roadway reconstruction vs bridges compared to Phase 1. The VA workshop also addressed additional roadway construction, stormwater runoff, and traffic related factors not included in the 2010 FEIS, such as:

- Construction impacts to roadway users (construction methods, timeline, etc.)
- Maintainability of the new bridges and roadway
- Overall safety of vehicle operations
- Impacts and accessibility to adjacent properties/neighbors
- Addressing any new Florida DOT highway standards
- Addressing any new Florida DEP stormwater quality requirements
- Maintenance of traffic (MOT) for visitors, community, tribes, private businesses

The workshop goal was to develop a recommend alternative for Phase 2, using the NPS mandated Choosing By Advantages (CBA) and Life Cycle Costing (LCC) approaches, as well as FDOT highway and FDEP environmental guidelines for new roadway construction.

The 2018 VA Workshop Phase 2 Alternatives:

The CBA and LCC methods identified several new alternatives that achieve the Original Plan objectives, and provide additional roadway design improvements. We confirmed that the new alternatives match the previous analyses by using the same factors to compare their benefits and impacts to the 2010 FEIS alternatives, particularly the recommended plan (6e). Our reevaluation of the hydrologic benefits of bridging determined that 3.3 miles of bridging (combination of the MWD/LRR and TT:NS Phase 1) represents an optimal bridging plan. This also reflects the marsh connectivity and sheetflow limitations from the L-29 Levee removal in the CEPP recommended plan. The final set of alternatives is listed below (see Figure 6).

No-Action Alternative: Includes 3.3-miles of bridging from the MWD/LRR and TT:NS Phase 1 projects, with no additional bridging or road work. The TT:NS project would be terminated at the end of Phase 1.

Alternative 1: The Original Plan (Alternative 6e from the FEIS), with 6.5-miles of total bridging, and the remaining roadway would be reconstructed to accommodate the L-29 Canal 9.7 ft. DHW required in future CERP projects.

Alternative 2: Includes 3.3-miles of MWD/LRR and Phase 1 bridging, along with modest conveyance improvements (72-foot wide pre-cast concrete culverts) to enhance water flow at six selected existing culverts. The remaining un-bridged segments of the roadway would be reconstructed to accommodate the CERP DHW criteria, and the remaining culverts would be replaced in-kind. The roadway shoulders would also be widened, and a swale would be constructed to treat stormwater runoff.

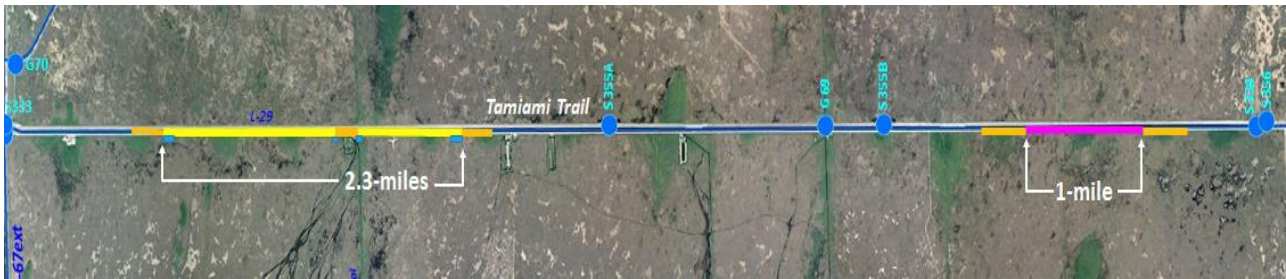
Alternative 3: Includes 3.3-miles of MWD/LRR and Phase 1 bridging. The remaining un-bridged segments of the roadway would be reconstructed/raised to meet the CERP DHW criteria, and the all of the existing culverts would be replaced in-kind.

6. Impacts and Benefits Evaluated in Confirmation of the Previous Analyses

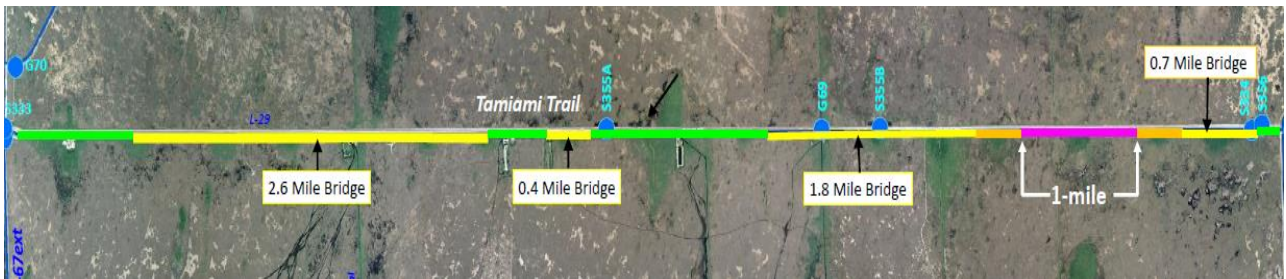
The impacts and benefits of the TT:NS Original Plan were based on constructing 2.8-miles of additional bridging, we therefore reevaluated the benefits of the new Phase 2 alternatives, relative to the Original Plan. Tables 1 through 5 explain how the VA alternatives meet each of the 2010 Final EIS objectives, with a summary in Table 6.

Project Objective 1: *Bridging and raising Tamiami Trail to achieve unconstrained flows into Northeast SRS and Florida Bay.* This objective is tied to the requirement to raise the roadway, to accommodate the 9.7 ft L-29 Canal DHW. The No Action Alternative does not meet this unconstrained CERP flow objective, since the L-29 Canal stage is constrained to an 8.5 ft DHW (from the MWD/LRR project) . Alternatives 1, 2, and 3 all meet this CERP flow objective, and are capable of passing higher average annual flows into Northeast SRS, based on hydrologic modeling that was recently evaluated in the MWD/C-111 Combined Operational Plan, and the 2014 CEPP FEIS (Table 1).

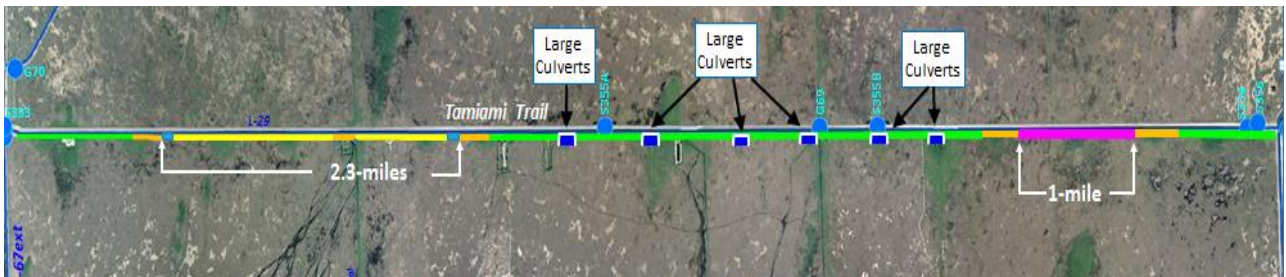
No Action Alternative: LRR & Phase 1, 3.3-Total Miles of Bridging, No Phase 2 Road Work



Alternative 1: Original Plan (6e), 6.5-Total Miles of Bridging, Remaining Roadway Raised



Alternative 2: LRR & Phase 1, 3.3-Total Miles of Bridging, 6 Large Culverts, Remaining Roadway Raised, Culverts In-Kind



Alternative 3: LRR & Phase 1, 3.3-Total Miles of Bridging, Remaining Roadway Raised, Culverts In-Kind

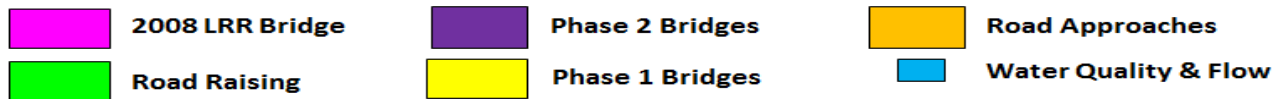
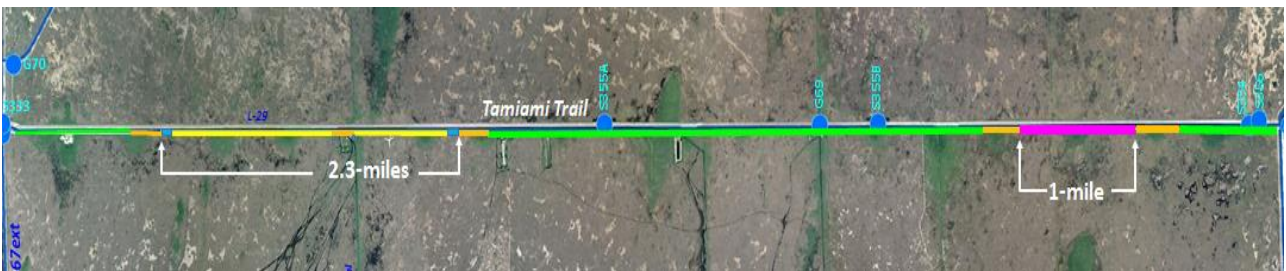


Figure 6. The four alternatives evaluated in the July 2018 Value Analysis workshop. The No Action Alternative includes the 2008 LRR & Phase 1 bridging, with no additional road work after Phase 1 completion. Alternative 1 is the Original Plan (Alternative 6e) from the 2010 Final EIS. Alternative 2 includes the 2008 LRR & Phase 1 bridging, with six large culverts, the remaining roadway reconstructed, and remaining culverts replaced in-kind. Alternative 3 includes the 2008 LRR & Phase 1 bridging, no larger culverts, the remaining roadway reconstructed, with all of the culverts replaced in-kind.

Table 1. Projected Average Annual Flow Volumes into Northeast Shark River Slough.

Alternative	L-29 Canal Maximum Stage Design High Water (ft NGVD)	Average Annual Inflows to Northeast SRS (in 1,000 ac-ft)
No-Action	8.5	550
1	9.7	760
2	9.7	760
3	9.7	760

Volumes are based on output from the Regional Simulation Model (RSM). The No-Action flow - Transect 18 in the Combined Operational Plan, Round 2 (Alt. N2). Alternatives 1, 2, and 3 – Transect 18 in the CEPP 2014 Final EIS Recommended Plan (Alt.4R2).

Project Objective 2: *Improve ecological connectivity by removing obstructions to sheetflow.*

This objective is linked to both total bridge length and the alignment of the bridges with planned openings in the upstream L-29 Levee. The objective includes: (1) the potential marsh connectivity between WCA-3B and Northeast SRS, if 3-miles of the L-29 Levee is removed in the CEPP, and (2) the restoration of sheetflow via increased openings between the L-29 Canal and Northeast SRS wetlands. Sheetflow was calculated based on the total number of 60 ft-wide representative cross-section segments, and as percentage of the roadway length (see section 2.3.1 and 2.3.3 of the 2010 Final EIS for a detailed explanation of these performance measures). The No Action alternative, and all three of the action alternatives are nearly equal in achieving the marsh connectivity objective, While Alternative 1 provides much greater sheetflow restoration (Table 2).

Table 2. Marsh Connectivity and Sheetflow (WCA-3B and Northeast Shark River Slough).

Alternative	Marsh Connectivity Score (WCA-3B to Northeast SRS)	Sheetflow Restoration Score # 60' Segments	% Roadway
No-Action	77%	30	22%
1	87%	59	61%
2	77%	36	22%
3	77%	30	22%

Connectivity is scaled to the percentage of total upstream L-29 Levee removal in the CEPP Recommended Plan. Sheetflow restoration includes both the number of 60ft-wide representative cross-sections, and total bridge length as a percentage of the 10.7-mile roadway length.

Project Objective 3: *Enhance the unobstructed movement of animals between the north and south of Tamiami Trail (reduce wildlife mortality).* This objective is based on the results of a 2004 Fish and Wildlife Service (FWS) Tamiami Trail wildlife mortality study, which examined wildlife mortality along four transects between S-333 and the L-31N Canal (see section 2.3.5 in the Final EIS for a detailed explanation of this performance measure). This objective was met by the No Action alternative, and all three of the action alternatives, since all four approaches enhance the unobstructed movement of animals across Tamiami Trail beyond the MWD/LRR project. Alternative 1 (the Original Plan) ranked highest in response to the 2.8-miles of additional bridging, which would provide a much greater reduction in vehicle induced wildlife mortality.

The six large culverts in Alternative 2 provide a slightly greater opportunity for wildlife to cross under the roadway (Table 3).

Table 3. Estimated Reduction in Wildlife Mortality Resulting from Bridging or Culverts.

Alternative	Total Bridge Length (miles)	Estimated Average Annual Wildlife Deaths Avoided
No-Action	3.3	861
1	6.5	1697
2	3.4	882
3	3.3	861

(84% of the recorded mortalities were reptiles, which would most benefit from the bridging/culverts). The six large culverts in Alt. 2 are included.

Project Objective 4: Restore slough vegetation and the deep water sloughs within ENP. This objective examines the number of bridge openings that are aligned with existing degraded sloughs. Bridge openings directly aligned with historic sloughs maximizes the potential to reestablish and maintain these sloughs, through removal of accumulated organic sediments (see section 2.3.2 of the Final EIS for a detailed explanation). All four alternatives met this objective compared to the MWD/LRR plan. The no-action and Alternative 3 have bridges limited to the Phase 1 footprint, while Alternatives 1 and 2 have bridges or culverts over a wider extent of the roadway. Including the six large culverts in Alternative 2, doubled the number of historic sloughs that can potentially be restored vs the no-action alternative (Table 4).

Table 4. Estimated Number of Sloughs Reconnected by Directly Aligning Bridges or Culverts.

Alternative	Total Bridge Length (miles)	Number of Sloughs Aligned with Bridges or Culverts
No-Action	3.3	6
1	6.5	10
2	3.4	12
3	3.3	6

Historic Slough Locations Match the Placement of the 1940's era Wooden Bridges, and the 1960's Culverts.

Project Objective 5: Restore processes that produce and maintain ridge and slough communities in ENP east of the L-67 Extension. This objective addresses the role of larger bridges in creating flow velocities that approach the natural marsh velocities. Studies by the SFWMD in the upstream stormwater treatment areas indicate that flow velocities in excess of 0.1 ft. per second adversely affect wetland plant colonization and growth. These estimated flow velocities are based on USACE RMA-2 Modeling of similar bridges (see the details in Engineering Appendix A, 2010 Final EIS). The No-Action and Alternatives 1, 2, and 3 all have multiple large bridges that provide flow rates below the 0.1 ft/sec target (Table 5).

Table 5. Estimated Average Flow Velocity 200 ft Downstream of the Bridges.

Alternative	Total Bridge Length (miles)	Average Velocity 200 ft Below the Bridges (ft/sec)
No-Action	3.3	0.06
1	6.5	0.03
2	3.4	0.06
3	3.3	0.06

Table 6. Summary Analyses of How the Alternatives Meet the Original Project Objectives.

Project Objective	No-Action	Alternative 1	Alternative 2	Alternative 3
(From the 2010 Tamiami Trail Next Steps Final EIS)	Phase 1 completed. 3.3-Total Miles of Bridging and 1.5-Miles of Approaches) No Additional Phase 2 Road Work	Alternative 6E from the Final EIS, 6.5-Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Six Large Culverts, Remaining Culverts Replaced In-Kind	Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Culverts Replaced In-Kind
Construct Additional Bridging and Road Raising of Tamiami Trail to Provide for Unconstrained Flows to Northeast Shark River Slough and Florida Bay	This Alternative does not Meet the Project Objective. Includes 3.3-Miles of Bridging, but the Lack of Roadway Reconstruction Reduces Inflows due to 8.5 ft. L-29 Canal Stage Limitation. (Constrained) Rank: Nil	This Alternative meets the Project Objective. The 6.5 -Miles of Bridging and Full Roadway Reconstruction, Improves Flow Distribution, and Allows for a 9.7 ft. L-29 Canal Stage (Unconstrained). Rank: High	This Alternative meets the Project Objective. The 3.3-Miles of Bridging, Full Roadway Reconstruction, and Six Large Culverts Improve Flow Distribution, and Allows for a 9.7 ft. L-29 Canal Stage (Unconstrained). Rank: High	This Alternative meets the Project Objective. Includes 3.3-Miles of Bridging, Full Roadway Reconstruction, and In-Kind Culvert Replacement, allows for a 9.7 ft. L-29 Canal Stage (Unconstrained). Rank: Moderate
Improve Ecological Connectivity by Removing Obstructions to Sheetflow (Reconnect WCA-3B and NESRS)	This Alternative meets the Project Objective. The 2.3-miles of Western Bridging Advances Sheetflow Restoration. Rank: Moderate	This Alternative meets the Project Objective. The 5.5-miles of Additional Bridging Significantly Advances Sheetflow Restoration. Rank: Moderate	This Alternative meets the Project Objective. The 2.3-miles of Western Bridging, and Six Large Culverts Advance Sheetflow Restoration. Rank: Moderate	This Alternative meets the Project Objective. The 2.3-miles of Western Bridging Advances Sheetflow Restoration. Rank: Moderate
Enhance Unobstructed Movement of Animals North and South of Tamiami Trail (Reduce Wildlife Mortality)	This Alternative meets the Project Objective. The 2.3-miles of Bridging and Planned L-29 Levee Removal Reconnects WCA-3B and NESRS, and Reduces Wildlife Mortality. Rank: Moderate	This Alternative meets the Project Objective. The 5.5-miles of Bridging and Planned L-29 Levee Removal Reconnects WCA-3B and NESRS, and Reduces Wildlife Mortality. Rank: High	This Alternative meets the Project Objective. The 2.3-miles of Bridging and Planned L-29 Levee Removal Reconnects WCA-3B and NESRS, and Reduces Wildlife Mortality. Rank: Moderate	This Alternative meets the Project Objective. The 2.3-miles of Bridging and Planned L-29 Levee Removal Reconnects WCA-3B and NESRS, and Reduces Wildlife Mortality. Rank: Moderate
Restore Slough Vegetation and Deep Water Sloughs (Reconnects Historic Sloughs)	This Alternative Partially meets the Project Objective. Four of the Nineteen Historic Sloughs have Improved Water Deliveries. Rank: Moderate	This Alternative meets the Project Objective. Ten of the Nineteen Historic Sloughs have Improved Water Deliveries. Rank: High	This Alternative meets the Project Objective. Twelve of the Nineteen Historic Sloughs have Improved Water Deliveries. Rank: High	This Alternative partially meets the Project Objective. Four of the Nineteen Historic Sloughs have Improved Water Deliveries. Rank: Moderate

Project Objective (From the 2010 Tamiami Trail Next Steps Final EIS)	No-Action Phase 1 completed. 3.3-Total Miles of Bridging and 1.5-Miles of Approaches) No Additional Phase 2 Road Work	Alternative 1 Alternative 6E from the Final EIS, 6.5-Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	Alternative 2 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Six Large Culverts, Remaining Culverts Replaced In-Kind	Alternative 3 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Culverts Replaced In-Kind
Restore Processes that Produce and Maintain Ridge and Slough Communities in NESRS (Match Marsh Velocities)	This Alternative meets the Project Objective, 3.3-Miles of Bridges, Reduces Flow Velocities by Increasing Sheetflow to Produce and Maintain Ridge and Slough Communities. Rank: Moderate	This Alternative meets the Project Objective, 6.5-Miles of Bridges, Reduces Flow Velocities by Increasing Sheetflow to Produce and Maintain Ridge and Slough Communities. Rank: High	This Alternative meets the Project Objective, 3.3-Miles of Bridges, Reduces Flow Velocities by Increasing Sheetflow to Produce and Maintain Ridge and Slough Communities. Rank: Moderate	This Alternative meets the Project Objective, 3.3-Miles of Bridges, Reduces Flow Velocities by Increasing Sheetflow to Produce and Maintain Ridge and Slough Communities. Rank: Moderate
Rank Legend:				
Nil – Does not Meet the objective to any degree				
Low – Meets the project objective to a low degree				
Moderate – Meets the project objective to a moderate degree				
High – Meets the project objective to a high degree				

7. Additional Benefits Evaluated in Phase 2 Planning

The impacts and benefits analysis in the July 2018 VA workshop established four additional project objectives related to: improved visitor services, protecting public health and safety, improved roadway reliability, and cost effectiveness and responsible development, which should be addressed during Phase 2. Figure 7 shows the Tamiami Trail typical new roadway cross-section from the Final EIS, with several required or recommended improvements.

Project Objective 6: *Improving Visitor Services, Viewscape and Construction Durations.* Improving the visitor experience includes enhancing the viewscape (by raising the roadway above the tree canopy), and minimizing the duration to complete the remaining TT:NS construction. The no-action alternative does not provide opportunities for improving the viewscape, but requires no additional construction. Alternative 1 has the highest opportunity for improving the viewscape (2.8-miles of additional elevated bridges), but it has the longest construction duration. Alternatives 2 and 3 provide no additional opportunities for an elevated viewscape, but reduce the construction duration.

Table 7. Improving Visitor Services by Elevating the Viewscape and Shortening the Construction Duration.

Alternative	Elevated Viewscape (percent of roadway)	Duration of Construction (years) Temporary Impact
No-Action	31%	0
1	61%	3-5
2	31%	2-3
3	31%	2-3

Project Objective 7: Protect Public Health, Safety, and Welfare. There are public benefits from adding wider shoulders, paving the full shoulder, and adding swales for stormwater treatment. A wider shoulder allows for safer use, while a fully paved shoulder can function as an evacuation lane during emergencies. The added swales meet the new FDEP water quality requirements. The no-action alternative does not raise the roadway, creating roadway stability concerns under high water conditions. Alternatives 1 & 3 raise the roadway, but have narrower shoulders and less pavement. Alternative 2 has wider shoulders, full pavement, and a swale system for improved water quality treatment (Figure 7).

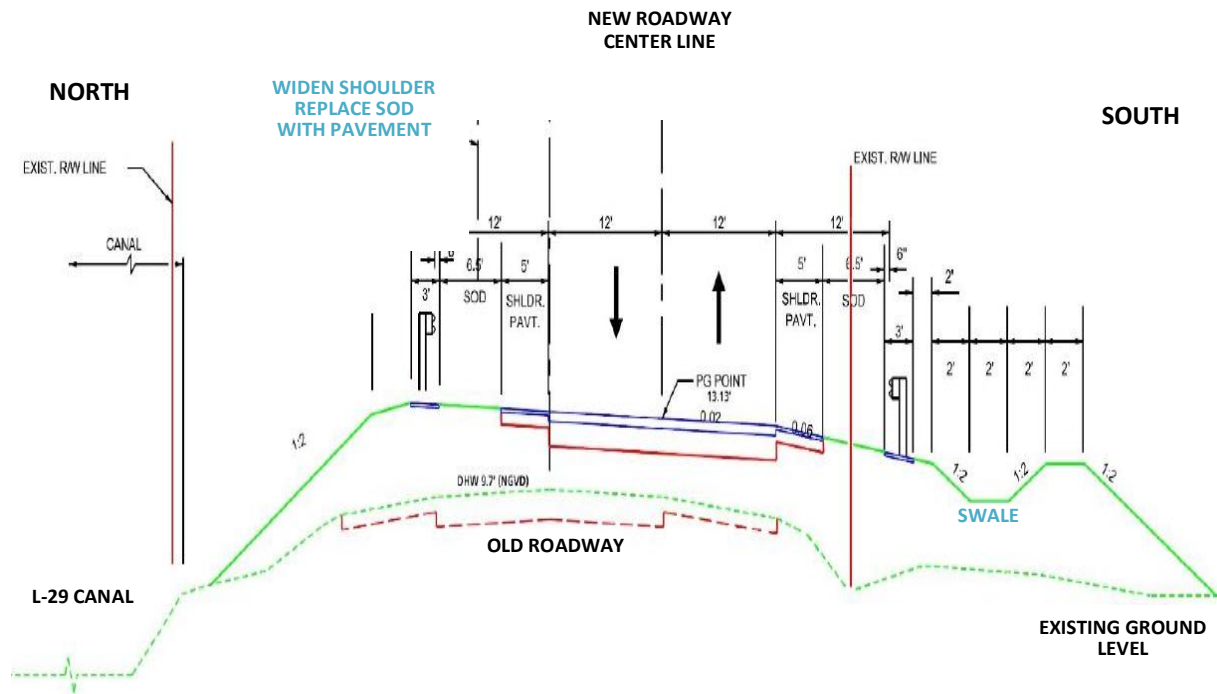


Figure 7. Typical cross-section of the reconstructed Tamiami Trail roadway. Alternative 2 would add the features labeled in blue, widening the shoulder by 1.5 ft., replacing the sod portion with pavement (FDOT recommendation), and adding a new swale system for stormwater treatment (new FDEP recommendation to meet water quality requirements).

Table 8. Opportunities to Improve Public Health, Safety, and Welfare (via Expanded Shoulders and Swales).

Alternative	Shoulder Width (ft.)	Paved Shoulder Width (ft.)	Swales for Improved Water Quality Mgmt.
No-Action	10.0	5	No
1	10.0	5	No
2	11.5	11.5	Yes
3	10.0	5	No

Project Objective 8: Increase Roadway Reliability, and Minimize Maintenance. The no-action alternative does not raise the remaining roadway, creating long-term instability and pavement maintenance concerns, due to high water saturation issues. Alternative 1 has additional bridges that are reliable, but require more inspections and routine stormwater system maintenance. Alternatives 2 & 3 reconstruct the roadway making it more reliable, alternative 2 has paved shoulders, but slightly higher maintenance (i.e. mowing the swales).

Table 9. Opportunities to Increase Roadway Reliability, and Minimize Maintenance.

Alternative	Percentage of Roadway with Bridges (Higher Inspections/Maintenance)	Shoulder Sod and Swale Width (in ft.), (Higher Maintenance)
No-Action	31%	5.0
1	61%	5.0
2	31%	8.0
3	31%	6.5

Project Objective 9: Cost Effective, Environmentally Responsible, and Beneficial Construction. This objective includes minimizing Phase 2 construction costs such as maintenance of traffic, reducing construction risks such as heavy equipment, and maintaining or improving access to tribal/developed areas, while reducing wetland impacts. The no-action alternative has no additional construction, so no maintenance of traffic, construction risks, or access issues are anticipated. Alternative 1's additional bridging has higher construction risks, but lower maintenance of traffic concerns (due to the wider work zone), and higher wetland impacts, that could be mitigated by roadway removal at the bridges. Alternative 2 would have a slightly larger work zone, reducing maintenance of traffic concerns, construction risks are moderate, but wetland losses would be largest (to accommodate the wider paved shoulders and swales). Alternative 3 has the smallest work zone with higher maintenance of traffic concerns, no anticipated construction risks, and the wetland impacts would be comparable to Alternative 2.

Table 10. Traffic Maintenance, Construction. Risks, Access Related Wetland Loss.

Alternative	Traffic Maintenance (Work Zone in ft.)	Constriction Risk Level (High: Pilings, I-Beams, or Requiring Cranes)	Wetland Losses Required to Maintain Facility Access
No-Action	0	No Risk	None
1	50	High	Moderate
2	35	Moderate	Low
3	30	Low	Low

Recommended Phase 2 Plan: Choosing By Advantages/ Life Cycle Costs Analyses

The July 2018 Value Analysis workshop recommended Alternative 2 as the best plan to complete the Tamiami Trail Next Steps project, in an environmentally responsible and cost effective manner (Figure 8). This Phase 2 plan builds on the water flow, marsh connectivity, and sheetflow benefits provided by the 3.3-miles of existing MWD/LRR and Phase 1 bridging and 1.5-miles of elevated approaches. This alternative would reconstruct/raise 6.5-miles of the remaining roadway to accommodate full CERP requirements, add six 72-foot wide pre-cast concrete culverts to reconnect historic sloughs that are restricted by Tamiami Trail, and replace the remaining culverts in-kind. This plan achieves the original project objectives, while acknowledging the constraints placed on the project, by the reduced L-29 Levee removal envisioned in the Central Everglades project (Table 6).



Figure 8. Recommended Phase 2 plan (Alt. 2 from the VA workshop). This plan includes 3.3-miles of bridging, six large culverts, reconstructing the remaining roadway, and replacing the remaining culverts in-kind.

Choosing by Advantages confirmed that the Original Plan (Alternative 1) scores higher on marsh flow velocities, restoring sheetflow, and reduce wildlife mortalities, but is comparable to the Phase 2 recommended plan on most of the other values (Figure 9). These project benefits are also limited by the reduced L-29 Levee removal in the recommended Central Everglades plan.

Life Cycle Costing shows that eliminating 2.8-miles of additional bridging lowers the total project cost (by \$118 million), achieves 78% of the maximum benefits (importance values), and reduces the construction duration by approximately 1.5 years (see Figure 10). Adding six large culverts maximizes the number of historic sloughs that can be reconnected, in the same locations as the proposed 0.4-mile and 1.8-mile bridges in the original recommended plan. Adding the swale system to the south of the roadway meets FDEP water quality requirements, while decreasing wetland losses within ENP, compared to Alternative 1.

The Phase 2 recommended roadway improvements increase driver safety by widening the shoulders and adding pavement to create opportunities for two outbound lanes during emergencies, such as hurricane evaluations. Reconstructing/raising the remaining 6.5-miles of roadway improves stability, for a roadway that will be designed for a 100-year lifespan, and can withstand major high water events and the impacts of climate change. The project is expected to enhance the economic competitiveness of South Florida and is an example of a carefully planned, cost-effective and environmentally conscious infrastructure project. Completion of the Phase 2 project ensures the quality of life for rural and tribal communities, and provides reliable access to economically and culturally important sites. The project improves water flow distributions, replenishes freshwater drinking aquifers, and preserves endangered species habitat.

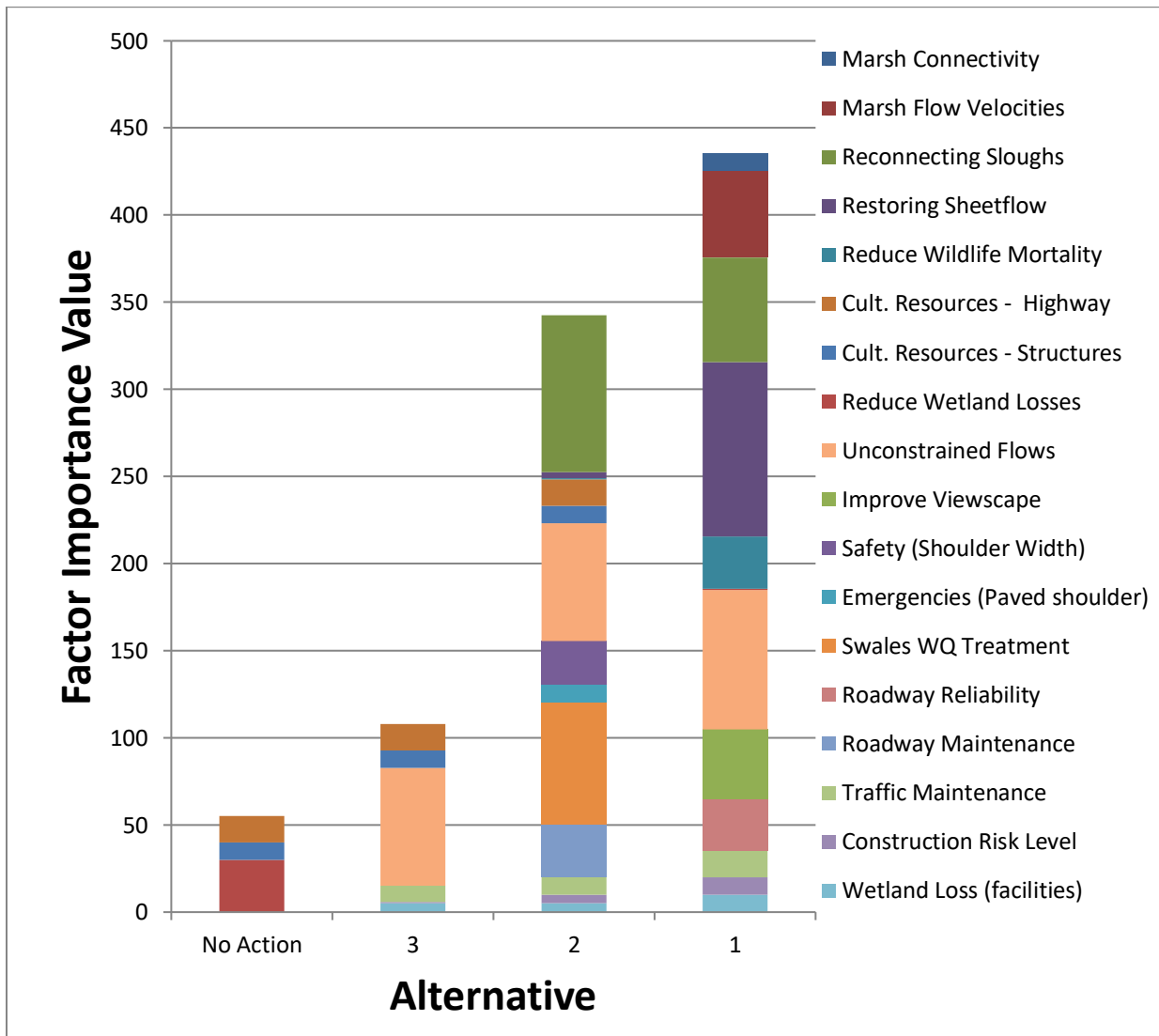


Figure 9. Factor Importance Values (Benefits) for the No-Action and three Value Analysis Workshop Alternatives. Factors 1-9 match the original project objectives, from the 2010 Final EIS. Factors 10-18 match the Phase 2 expanded roadway improvement objectives.

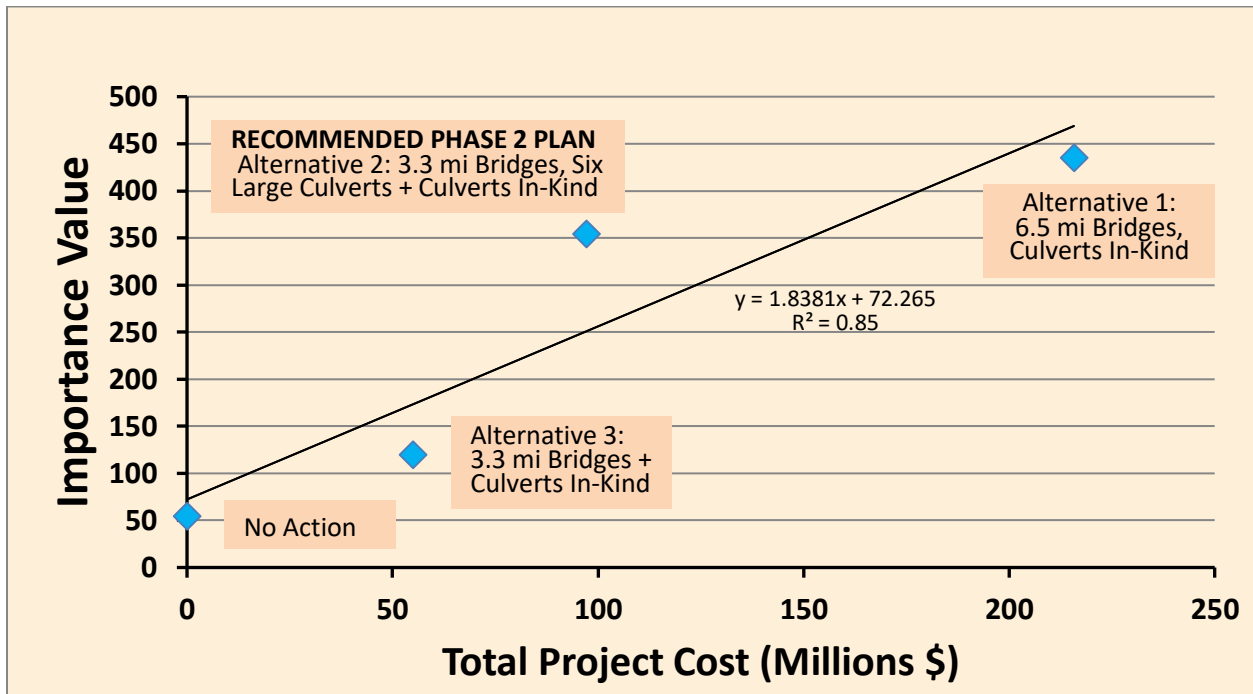


Figure 10. Factor Importance Values vs Total Project Cost for the No-Action and three VA Alternatives.

Changes in Environmental Impacts and Effects Determinations

The original recommended plan (Alt. 6e) included 6.5-miles of total bridging and reconstructing/raising the remaining roadway to remove flow constraints. To confirm that this new analysis matches the previous analyses we re-evaluated the environmental impacts of the new Phase 2 alternatives, relative to the No-Action and the Original Plan. In addition to this impact assessment, we also re-initiated consultation with the US Fish and Wildlife Service (USFWS) to ensure protection of federally listed species, such as the Florida bonneted bat (*Eumops floridanus*) which was added to the list of endangered species since the release of the 2010 FEIS. A full summary of the impact assessments is included at the end of this report (see Table 16).

a. Soil Impacts

Short-term impacts to soils in Northeast Shark River Slough would occur during Phase 2 project construction. Based on the construction activities during Phase 1, no access routes for removal of excavated material will be needed outside of the new roadway and swale prism. Disturbance and compaction of soils is anticipated from temporary construction-related activities, and would be limited to this new roadway prism. Soil impacts resulting from temporary construction-related activities for the Phase 2 roadway work are expected to be adverse, local, minor, and short-term. The estimated permanent and temporary acres of soil impacts associated with the Phase 2 recommended alternative corresponds with the area of predicted wetland impacts (see Table 11). The Phase 2 impacts to wetland soils were estimated by summing the acreage of impacts from the freshwater marsh, mixed wetland hardwood/shrub, sawgrass marsh (see Figure 11). The permanent soil impact for the Phase 2 recommended alternative is estimated to be approximately 24.18 acres, 6.8 acres less than the permanent soil impacts than the original alternative (6e) in the

2010 Final EIS. Additional temporary soil impact acreage is estimated to be zero, since it does not extend beyond the roadway and swale construction footprint.

Best management practices would be implemented to minimize impacts to soils resulting from Phase 2 construction and maintenance-related activities. Long-term effects to soils would result from roadway construction and maintenance. Soils would be excavated in the footprint of the roadway, large culverts, and swales during construction. It is anticipated that excavation of the soils and the vegetation layer within this construction prism may increase nutrient loading in the adjacent wetlands, or cause phosphorus assimilation processes to occur further downstream into ENP. Best management practices such as silt fencing and other erosion control actions would be implemented to minimize impacts to soils resulting from Phase 2 construction. It is expected the impacts resulting from this soil excavation and disturbance would be adverse, local, minor and long-term because soils would be permanently removed from the project area.

b. Wetland Impacts

This section describes the wetland impacts expected under the Phase 2 recommended plan, in comparison to the original recommended plan (6e) in the Final EIS. We geo-referenced the AutoCAD® roadway engineering design files and overlaid them on the Florida Land Use, Cover, and Forms Classification System (FLUCCS) Level 3 shapefile layer (SFWMD 2011) to provide an initial estimate of the quantity and type of wetland vegetation community impacted (see Figure 11). Since preliminary design of the Phase 2 plan has not been completed, the specific impacts to different wetland community types and precise areas of impact were not determined. This assessment is based on the conceptual level of design described during the July 2018 Value Analysis workshop, based on a set of assumptions about the number, size, and placement of the large culverts, swales, and other roadway features. The general assumptions that we made for this conceptual level wetland assessment are:

- The width of fill to create the expanded roadway sub-base and swale extends approximately 30 feet beyond the existing wetland jurisdictional line, into Everglades National Park.
- The 12 ft wide by 6 ft tall arched pre-cast concrete culvert sections will be installed in series to form the six, 72-foot wide culverts in Alternative 2. Wetland function will not be maintained within their footprints, and will require the same 30-ft expansion into wetlands as the roadway and swales.
- No temporary construction impacts will occur beyond the expanded roadway footprint, and swales based on the construction practices used in the Phase 1 roadway work.

The wetland and habitat impacts in the final design will be less than what the NPS calculated under these assumptions. During the preliminary design phase, the NPS will also work to minimize impacts to wetlands. An example of this expected reduction in wetland impacts is the change in the Phase 1 western 2.6-mile bridge design in the first Modified Alternative. The December 2013 VA workshop recommended substituting two bridges totaling 2.3-miles and a within corridor downramp for the planned 2.6-mile bridge and southern downramp in Alt. 6e. This change resulted in a 2.34 acre reduction in permanent wetland impacts (from 16.41 acres to 14.07 acres). Further reductions in wetland impacts during Phase 2 will result from the lessons learned in the Phase 1 implementation.

The NPS also recognize that this conceptual-level design is not sufficient to determine if detention ponds will be needed adjacent to the existing commercial and tribal entrance roads and parking lots. We therefore added approximately 20% to the wetland impact estimates resulting from this conceptual design level assessment. Again, if these treatment ponds are required, we will re-evaluate their impacts during the preliminary design phase.

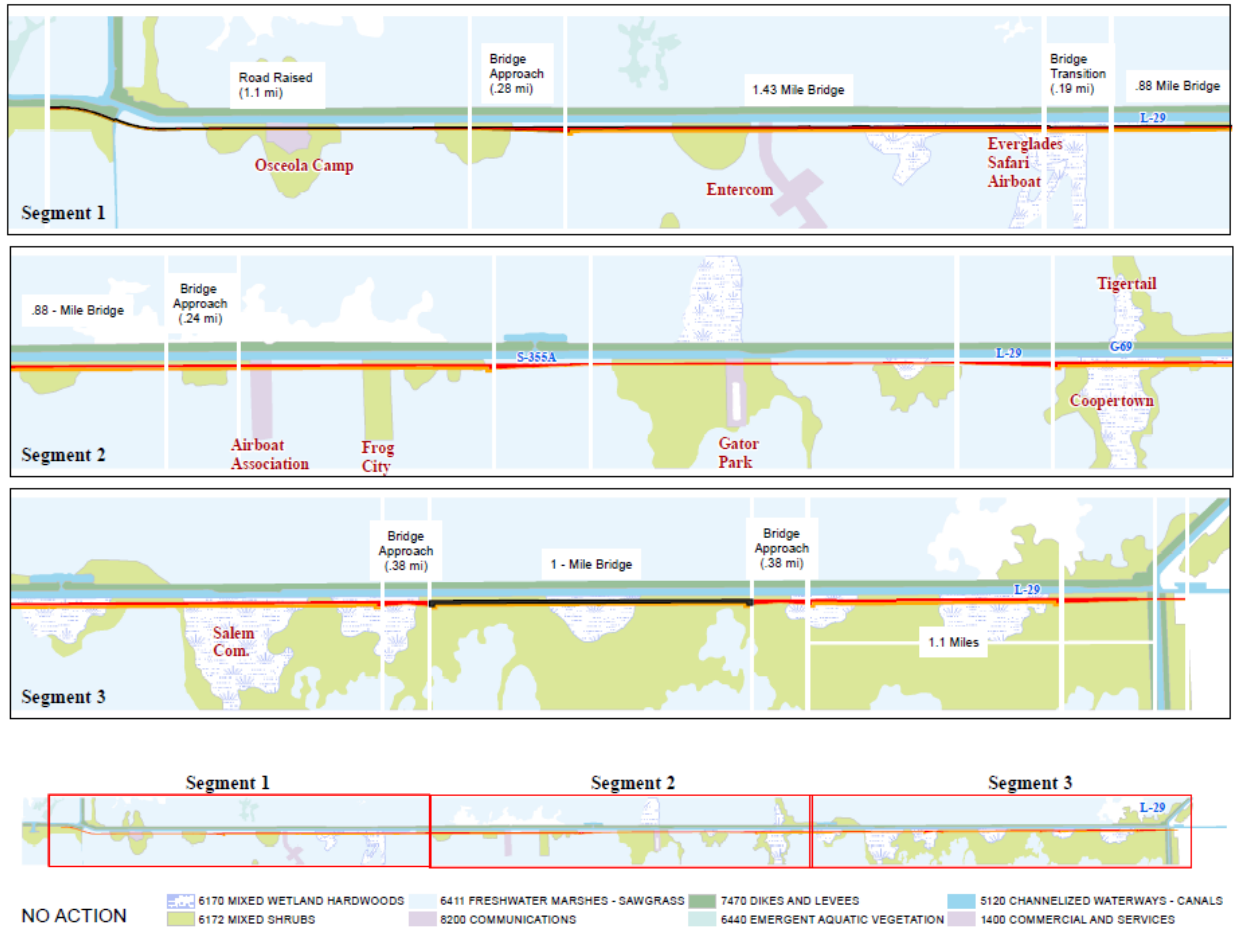


Figure 11. Wetland communities map for the Tamiami Trail project area. This information was used to estimate soil and wetland impacts for the Phase 2 Recommended Alternative, compared to the No-Action Alternative.

The Phase 2 recommended alternative, with the above assumptions applied, will result in a total of 24.18 acres of permanent impacts to wetlands, which includes the 20% “contingency” wetland impacts. This permanent wetland impact is approximately 6.8 acres less than the permanent wetland impacts in the Original Plan (Alt.6e) in the 2010 Final EIS (adjusted for the reduced impacts from our Phase 1 experience). The Phase 2 recommended alternative has no temporary wetland impacts, compared to 22.4 acres for Original Plan (alt. 6e) in the 2010 Final EIS. This reduction results from constraining wetland impacts to the area within the new roadway and swale prism. Table 11 provides the estimated permanent and temporary wetland impacts of the Original Plan (6e) as compared to wetland impacts from the Phase 2 recommended alternative.

The original plan described in the Final EIS included the creation of wetlands (or more correctly, open water areas) that would result from removal of the existing Tamiami Trail roadway. Since three bridges proposed in alternative 6e (0.40-mile, 1.80-mile, and 0.70-mile bridges) are not included in the Phase 2 recommended alternative, those areas would no longer contribute wetland mitigation benefits to offset these impacts. Since these areas would have been scraped to bedrock during bridge construction, the created open water areas do not provide wetland function comparable to the existing wetlands downstream of the Trail. Additionally, the areas underneath the bridges were also expected to create some degree of open water function, because the height of the bridge allowed sufficient light to sustain some deep water vegetation. These open water areas that would have been created in Alternative 1, total 21.93 acres (see Table 11), and are not included in the determination of wetland mitigation requirements.

Table 11. Estimated soil and wetland impacts of the Original Plan and the Phase 2 plan based on the Florida Land Use, Cover, and Forms Classification System analysis.

Project Design	Estimated Permanent Wetland Impact (acres)	Estimated Temporary Wetland Impact (acres)	Estimated Open Water Areas Created (acres)*
Alternative 1 Original Plan (2010)	30.97	22.4	21.93
Alternative 2 Modified Phase 2 Plan	24.18	0	0

*The created open water areas have a functional value of approximately 0.25% of the adjacent natural wetlands, which translates to 5.13 functional units, see the section on UMAM wetland functional losses.

While the overall wetland impacts are reduced with the Phase 2 recommended alternative relative to the original plan, no new open water areas would be created by the Phase 2 recommended alternative. The wetland impact calculations do not include these created open water areas. These changes therefore do not result in a modification to the NEPA impact intensities reported in the 2010 Final EIS, see Table 16 below.

UMAM Wetland Functional Units - The NPS conducted a preliminary tabletop Uniform Mitigation Assessment Method (UMAM) to estimate the wetland relative functional losses anticipated under Phase 2. Results of this preliminary tabletop UMAM are summarized in Table 12. UMAM scores for location and landscape support, water environment, and community structure are based on lessons learned from the previous Tamiami Trail UMAM impact assessments within the project area, our knowledge of the wetland values and functions in this region of ENP, and the Florida Administrative Code Chapter 62-345. Because the impacts were based on the VA workshop conceptual design, we did not separate impacts to fine-scale vegetation types, and only considered generalized wetland functional value of the types that occur in the area expected to be impacted. These values will be more fully defined and improved following the preliminary detailed design, when we can clearly identify impacted sites, and avoid the higher-quality sites. These values will likely change when we complete the final UMAM after preliminary design, based on differences in the quality of wetlands within detailed design footprint, differences in the evaluation of wetland quality based on input from other agencies, and changes in acreage impacted in the detailed design. This functional evaluation also does not

include the expected improvements in water environment that result from inclusion of swales and stormwater treatment in the proposed conceptual design; the potential contribution of those features to wetland function will be evaluated in subsequent UMAM evaluations that will be completed for permitting following detailed design.

The initial UMAM indicates that the Phase 2 recommended alternative will result in an overall reduction of 11.28 wetland functional units, through the fill of wetlands resulting from the widened road base. The NPS will acquire an equivalent or greater number of wetland mitigation credits to offset these impacts, either at the nearby Hole-in-the Donut (HID) mitigation project managed by NPS, or through other permittee- responsible mitigation within Everglades National Park.

Table 12. Tabletop Uniform Mitigation Assessment Method (UMAM) Summary for the Phase 2 Recommended Plan, completed by the National Park Service.

	Impact Assessment -	
	Current Conditions ¹	With Project ²
Location & Landscape Support	5	0
Water Environment	4	0
Community structure	5	0
SCORE ⁵	0.47	0.00
Delta = [with-current]		-0.47
Acres Impacted ⁶		24.18
Functional Loss (FL) ⁷		-11.284
Time Lag ⁸		
Risk Factor ⁹		
Relative Functional Gain (RFG) ¹⁰		
Acres of Mitigation Needed ¹¹		

During construction of the Phase 1 bridge project, the associated removal of a South Florida Water Management District’s telemetry tower resulted in restoration of wetlands and generated mitigation credits, which may be used to compensate for the impacts of Phase 2 implementation. That decision will be made in conjunction with the preliminary design and permitting process.

The updated UMAM for the remaining features in the Original Plan in the 2010 FEIS indicate that alternative 6e would have resulted in a loss of 14.26 wetland functional units from permanent impacts. However, removal of some sections of the existing Tamiami Trail would result in creation of open water areas with a functional value of 5.13 functional units (includes the time lag and risk factor). This alternative would also require off-site mitigation for the remaining 9.13 functional units, and this amount would similarly be met at the HID or another

permittee-responsible mitigation site. The NPS will assure that any off-site mitigation will meet the requirements for Clean Water Act permits, State Environmental Resource Permits, and other applicable permits, as well as maintaining consistency with the NPS Wetland Statement of Findings prepared for the 2010 FEIS. We will also address mitigation for potential impacts to wood stork foraging habitat, to maintain consistency with the 2010 Biological Opinion prepared in conjunction with the 2010 Final EIS.

In summary, the UMAM results show that the Tamiami Trail Next Steps Phase 2 project will have the same or less wetland impacts than the Original Plan. Any needed off-site mitigation, will fully mitigate for the project impacts to wetland function and values, and that State of Florida and federal wetland mitigation requirements have been met. It should also be noted that with implementation of future Comprehensive Everglades Restoration Plan projects, such as the CEPP, our long-term restoration benefits to wetlands are anticipated to substantially outweigh the current project's impacts to wetland functions and values, though those future benefits are not assessed explicitly in the current evaluation. The NPS finds that the Tamiami Trail Phase 2 project is consistent with NPS Director's Order 77-1, which clarifies the service-wide no net loss of wetland policy, as well as Executive Order 11990 for the protection of wetlands, and associated State and Federal regulatory requirements.

c. Water Quality Impacts

Florida Administration Code (Part IV, Chapter 373, Management and Storage of Surface Waters, ERP/CERP) requires that implementation of the Phase 2 plan would cause no harmful impacts to the water resources, be in compliance with state water-quality standards, and be clearly in the public interest. This is particularly important, because stormwater from the roadway and adjacent facilities may discharge into ENP, which is designated an Outstanding Florida Water.

To ensure compliance with the requirements stated above, the FDEP determined that it is essential to include a berm and swale system on the south side of the Tamiami Trail, to avoid the direct release of stormwater runoff into the L-29 Canal or ENP wetlands. The roadway design would also be modified from the current crowned road surface, with the new roadway sloped southward, to direct stormwater runoff into these swales. The shallow, grass lined swales can remove sediment, nutrients, and pollutants from surface water through the combination of direct infiltration, or by routing the runoff into a nearby detention area. A similar system for managing stormwater runoff, involving deck drains, parallel collection lines, and runoff treatment units (RTUs) were installed on the Phase 1 bridges. These are connected to dry detention ponds (DDPs), located at the south side of each bridge approach/transition. These DDPs are long-narrow features that fit within the roadway construction and upland transition zone, to minimize the loss of adjacent higher quality wetlands. Which approach is most effective for treating the roadway runoff will be determined during the preliminary design phase. The design for the berm and swale system and any associated DDPs will be configured to not only meet but to exceed the requirements established by law.

Short-term effects on water quality in Northeast Shark River Slough would occur during project implementation. Excavation of the project area and other construction-related disturbance activities are anticipated to potentially cause temporary impacts to water quality such as increased total phosphorus, total suspended solids, and turbidity in the downstream surface

water. To minimize water quality impacts, Best Management Practices (BMPs) would be implemented during roadway construction. These practices would include employment of staked silt fences and turbidity barriers. Silt fences would be employed prior to commencement of construction around the outer perimeter of each work zone to minimize the potential for impacts to adjacent undisturbed wetlands. Turbidity barriers would be employed in canals and deep water sites prior to commencement of construction at a sufficient distance from the work zone to create a temporary mixing zone upstream and downstream of the project area to allow for settling of any turbidity generated during construction. Additionally, a turbidity monitoring plan would be employed during construction. If monitoring reveals that turbidity levels exceed the standards, construction activities would be immediately halted and shall not resume until corrective actions are employed.

The effects determination on the original recommended plan (Alternative 6e) found that adverse water-quality effects resulting from construction and maintenance of the Tamiami Trail roadway would be local, minor, and of short-term duration. The NPS has determined that this same assessment applies to the Phase 2 recommended plan.

d. Land Use Impacts

The 2010 Final EIS documented that approximately 93% of all permanent land use impacts and 97% of all temporary land use impacts are associated with the loss of wetlands to expand the new transportation corridor. Impacts resulting from this conversion are discussed in detail in the prior wetland impact section. Conversion of commercial, communications, and developed land uses combined represented less than 2 acres of total impacts, and the Phase 2 impacts are comparable. These short and long-term impacted areas include very limited portions of the entrances or parking areas at the three commercial airboat facilities, two radio towers, and the two Miccosukee villages.

These commercial, communications, and developed land use areas will experience short-term adverse impacts due to the Phase 2 roadway construction activities. These include entrances that can be temporarily blocked by construction activities, noise and dust generated by construction activities, and traffic detour activities while the entrances to these facilities are raised to merge with the new elevated roadway. Construction activities may dissuade customers from visiting a commercial business operation or reduce the enjoyment of customers utilizing the business site. Long-term, adverse impacts are associated with the loss of commercial or developed land uses to expand the transportation corridor; however these impacts are considered minor given the small acreages that are involved. Any impacts would be short-term, adverse, and highly localized. While the long-term impacts are considered beneficial, since the roadway reconstruction would also raise these entrance roads, and parking areas. The new transportation corridor would be more stable, safe, and reliable, particularly during high water events. Consequently, there would be no impairment of land use as a result of the Phase 2 construction.

e. Endangered Species Effects Determination

This section describes the threatened and endangered species impact assessment and effect determinations (Section 7 of the Endangered Species Act compliance requirement) for the Phase

2 recommended alternative compared to the original recommended plan (in the July 8, 2014 biological opinion amendment for the Tamiami Trail modifications Next Steps project phase 1), and incorporates newly listed species and associated information. Soil and wetland impacts are reduced in the Phase 2 plan compared to the comparable roadway sections of alt 6e in the 2010 FEIS. That biological opinion did not include creation of wetlands (open water areas) resulting from the removal of the existing Tamiami Trail at the bridges, due to uncertainty and timing of potential availability. This led to fewer impacts to wood stork (*Mycteria americana*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), and Florida panther (*Puma concolor coryi*) habitat; however, the reduction in impacts does not alter the Section 7 effect determinations for threatened and endangered species described in the Original Plan FEIS.

The 2014 biological opinion amendment also addressed several newly listed species for the area included in the Phase 1 assessment only. Since the 2014 amendment, an additional five species have been listed as threatened or endangered, and one additional species is proposed for listing. Table 13 below provides the list of species, the Section 7 determinations of effect for the Phase 2 project, and the determinations relative to the 2010 biological opinion on the Tamiami Trail Next Steps project (FEIS).

Table 13. Threatened, Endangered, and Proposed species considered during Section 7 consultation on the Tamiami Trail Next Steps Phase 2 project.

Species	Scientific name	Listing Status	Section 7 determination	Change from 2010 biological opinion
Cape Sable seaside sparrow	<i>Ammodramus mariitimus mirabilis</i>	Endangered, designated critical habitat	MANLAA	None - Confirmation of previous analysis
Wood stork	<i>Mycteria americana</i>	Threatened	Likely to adversely affect	None - Confirmation of previous analysis
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	Endangered, designated critical habitat	MANLAA	None. Confirmation of previous analysis
Eastern black rail	<i>Laterallus jamaicensis ssp. jamaicensis</i>	Proposed threatened	MANLAA	Not addressed in 2010
Florida leafwing butterfly	<i>Anaea troglodyta floridae</i>	Endangered, designated critical habitat	No effect	Not addressed in 2010
Bartram's scrub hairstreak	<i>Strymon acis bartrami</i>	Endangered, designated critical habitat	No effect	Not addressed in 2010
Florida bonneted bat	<i>Eumops floridanus</i>	Endangered	MANLAA	Not addressed in 2010
Florida panther	<i>Puma concolor coryi</i>	Endangered	Likely to adversely affect	None - Confirmation of previous analysis
West Indian manatee	<i>Trichechus manatus</i>	Threatened, designated critical habitat	MANLAA	None - Confirmation of previous analysis
Blodgett's silverbush	<i>Argythamnia blodgettii</i>	Threatened	No effect	Not addressed in 2010
Pineland sandmat	<i>Chamaesyce deltoidea ssp. pinetorum</i>	Threatened	No effect	Not addressed in 2010

Species	Scientific name	Listing Status	Section 7 determination	Change from 2010 biological opinion
Cape Sable thoroughwort	<i>Chromolaena frustrata</i>	Endangered	No effect	Not addressed in 2010
Florida prairieclover	<i>Dalea carthagenensis var. floridana</i>	Endangered	No effect	Not addressed in 2010
Florida pineland crabgrass	<i>Digitaria pauciflora</i>	Threatened	No effect	Not addressed in 2010
Everglades bully	<i>Sideroxylon reclinatum ssp. austrofloridense</i>	Threatened	MANLAA	Not addressed in 2010
Florida bristle-fern	<i>Trichomanes punctatum ssp. floridanum</i>	Endangered	No effect	Not addressed in 2010
Eastern indigo snake	<i>Drymarchon corais cooperi</i>	Threatened	MANLAA	None - Confirmation of previous analysis

Within this document, we are only addressing updated information on impacts resulting from the current conceptual design of Phase 2, and are not updating the analysis of the entire plan in the FEIS. Any future changes to this project design will need to be re-analyzed relative to the analysis in the FEIS and associated biological opinion and the Park will need to re-engage in Section 7 Consultation to update threatened and endangered species determinations.

“Likely to Adversely Affect” Determinations

Wood Stork

The circumstances affecting the threatened wood stork that were considered in the FEIS remain largely unchanged and the analysis in the biological opinion is still applicable. Compared to the biological opinion, the proposed impacts of Phase 2, when considered in conjunction with the effects that have already occurred during construction of the 2.3-miles of bridges, are less than those assessed in the 2010 biological opinion. Wetland impacts are proposed to be offset through mitigation at the nearby Hole-in-the-Donut mitigation site, or another similar permittee-responsible mitigation site within Everglades National Park, and this mitigation will at least replace the reductions in foraging suitability within the core foraging habitat of the three stork colonies that occur near Tamiami Trail. The 2.3-mile bridging design resulted in fewer impacts to stork foraging habitat than assessed, and the proposed Phase 2 plan also reduces the anticipated wetland impacts, primarily by eliminating the temporary construction impacts. The acreage of wetlands that will be affected with the 30-ft expansion of the existing road corridor fall within those assessed for the road raising and bridging that were originally assessed. Therefore, Phase 2 has no impacts to stork foraging beyond those considered in the BO.

Phase 2 does include construction within the buffer zones of existing wood stork colony sites, but those effects are also reduced. Instead of building an elevated bridge (with a larger area of habitat disturbance) near the Tamiami East wood stork colony, Phase 2 proposes to expand the road base and widen the road prism. This activity still has the potential to result in disturbance to nesting storks, but these effects, with associated mitigations, were fully addressed in the 2010 BO. Consequently, we believe the proposed change in design for Phase 2 falls completely within the analysis of effects and resulting incidental take in the previous BO.

Florida panther

Similar to the wood stork, the proposed Phase 2 project, when considered in conjunction with the construction of the 2.3-miles of bridges, is expected to have fewer potential impacts to Florida panthers than what was considered in the 2010 FEIS and associated biological opinion. There will be reduced impacts to panther habitat under Phase 2 relative to the FEIS, and consequently the 1,278.48 panther habitat units that have been allocated for the Tamiami Trail Next Steps project are expected to be sufficient to address Phase 2 implementation.

One design modification in Phase 2 may also provide additional benefit for panthers. The construction of a stormwater treatment swale immediately south of the existing roadway may provide a high-likelihood movement corridor that will not subject panthers to increased risk from roadway mortality. The elevated berm on the south side of the swale will be well-separated from traffic flow. There was no such feature proposed in the FEIS. Consequently, we believe the proposed change in design for Phase 2 falls completely within the analysis of effects and resulting incidental take in the previous BO.

After reviewing the proposed design of Phase 2 compared to the FEIS, and taking into account updated information about the status of the other species considered in the biological opinion, the effects considered previously on the Cape Sable seaside sparrow or its critical habitat, Everglade snail kite or its critical habitat, West-Indian manatee or its critical habitat, or the Eastern indigo snake will not be different than those previously considered. The FWS has confirmed that the previous determinations for construction of the Tamiami Trail modifications are not likely to adversely affect these species will also apply to the proposed conceptual design of Phase 2.

Species not Considered in the 2010 Biological Opinion

The following section includes the species listed since the 2010 biological opinion. Some of these species were considered in the 2014 biological opinion amendment, but that consideration was limited to consideration only of the effects resulting from construction of the 2.3-mile bridges. Below, we summarize the status and provide our determinations of effect of the Phase 2 plan for all newly listed species that occur in freshwater areas of Everglades National Park.

“May Affect, but Not Likely to Adversely Affect” Determinations.

Eastern black rail

This species is currently proposed for listing as threatened, and this consideration is in support of the conference process since consultation is not yet required. However, we propose Section 7 determinations of effect in hopes that this document can be adopted to meet consultation requirements if/when the species is listed.

We have little detailed information about the occurrence or distribution of the black rail within Everglades National Park. The Florida Breeding Bird Atlas considers it present. This documentation, combined with records from birders, suggests that breeding activity may occur within the Park. There have not been thorough marsh bird surveys in the vicinity of Tamiami Trail. However, surveys for secretive marsh birds were conducted in 2013 on transects near the

project area, along the L-67 extension and along the L-31N levee, as well as other sites (Slater 2015). During these surveys, black rails were not recorded, though it is acknowledged that the surveys targeted the marsh bird species that were known to occur.

Even though breeding is not known, and we believe is not likely within the project area, black rails are known to occur in the area during migration and over the winter, and there is some potential for construction to affect wintering black rails, and the loss of wetlands on-site may affect suitability of habitat, though mitigation wetlands are expected to replace any lost habitat function in terms of available quantity. We believe the effects will consist of temporary disturbance of individual birds, and no population-level effects, that would lead to them moving away from the project area during construction; these effects are insignificant and discountable.

Mitigation measures proposed in the FEIS apply to this species that will also help to avoid and minimize effects:

- Pre-construction surveys would be conducted to identify any federal- and state-listed species occurring in the project area. Should any individuals or active breeding sites be identified, additional protective measures would be taken to avoid impacts (e.g., providing additional information to contractors about the species).
- The Florida Fish and Wildlife Conservation Commission (FWCC) and the U.S. Fish and Wildlife Service would be notified of the presence of these species in the project area.
- During the environmental training, construction contractors would receive training on federally and state-listed species and how to recognize and avoid impacts to these species.

Because we recognize some potential for the eastern black rail to occur, presence of black rails would be evaluated during threatened and endangered species surveys prior to construction. Should the eastern black rail or evidence be detected during the survey and show potential for them to be affected by the project, conference or consultation with the U.S. Fish and Wildlife Service would be reinitiated. Short-term, minor effects are expected to be limited to temporary disturbance during construction, and potentially reduced foraging habitat in the immediate vicinity of the bridge. In response, if rails are present in the project area, they are expected to move to adjacent high quality foraging areas. These effects are anticipated to be insignificant and discountable. Due to the small but permanent impacts to potential Eastern black rail foraging habitat, long-term, minor, localized impacts to trail would be anticipated with implementation of phase 2. The FWS has concurred that the proposed Phase 2 plan will not jeopardize the Eastern black rail, completing conference requirement. Additionally, the FWS concurred with a preliminary determination that the project may affect, but is not likely to adversely affect the black rail under the consultation process, which could be adopted if/when the species is listed.

Florida bonneted bat

The Florida bonneted bat is the largest bat occurring in Florida and is named for its large ears that extend beyond its eyes, forming the appearance of a bonnet (FWS 2013 (a)). This bat species feeds on insects and is known to inhabit forests, wetlands, other types of natural habitats, and suburban and urban areas (FWS 2013 (a)). Roosting sites within south Florida generally occur within manmade structures and trees.

Since the species was listed as endangered, there has been extensive acoustic monitoring completed across south Florida, including within ENP. McCleery et al. (2015) documented presence of bonneted bats across most of the park, including along the L-67 extension and the L-31N canal near the proposed project area. Additional informal acoustic surveys conducted by park staff have also documented the species. However, no roost sites or maternity colonies have been documented within Everglades National Park. Based on the NPS survey data and data of our partners, we continue to believe that the Florida bonneted bat has the potential to occur within the Phase 2 project area, due to the project site proximity to other known areas of bonneted bat occurrence, though the species has still not been documented in the project footprint. It is uncertain if the Florida bonneted bat roosts within trees or tree cavities within Northeast Shark River Slough, ENP or artificial structures bordering Northeast Shark River Slough. Due to the limited mature woody vegetation and lack of other suitable roost substrates, it is unlikely that Florida bonneted bats roost in the project area. It is possible that the Florida bonneted bats forage for insects within the Northeast Shark River Slough of ENP because they are known to forage over wetlands and range widely across the landscape. For the purpose of our analysis, we assumed the bat is foraging but not roosting in the project area. We do not anticipate that implementation of the Phase 2 project will significantly impact potential foraging because the loss of wetlands is small compared to the availability of similar habitats adjacent to the project, and bonneted bats are not known to preferentially forage in the wetland types that will be affected. Beneficial effects to bat foraging habitat are also anticipated to result from the removal of the Tamiami Trail roadway, providing an overall net increase in foraging habitat as compared to current conditions. The expansive habitat south of the project area in ENP would provide suitable foraging during the limited time of project construction and foraging bats (if present) would likely move away from the bridge and construction as a result of any disturbance.

The concrete pre-cast culverts could have potential to support roosting bats, including bonneted bats within gaps in expansion joints between adjacent spans, and other crevices remaining after installation. We believe the likelihood of using these features is low, nonetheless, there may be increased night roosting sites available for the Florida bonneted bat resulting from implementation of the Phase 2 project, if this species occurs in the project area. Sustainability of potential night-time roosting benefits would be contingent on implementation of bridge maintenance and repair protocols that minimize disturbance to roosting bats.

General mitigation measures for threatened and endangered species will be followed during implementation of Phase 2 and includes the following:

- Pre-construction surveys would be conducted to identify any federal- and state-listed species occurring in the project area. Should any individuals or active breeding sites be identified, additional protective measures would be taken to avoid impacts (e.g., providing additional information to contractors about the species).
- The Florida Fish and Wildlife Conservation Commission (FFWCC) and the U.S. Fish and Wildlife Service would be notified of the presence of these species in the project area.
- During the environmental training, construction contractors would receive training on federally and state-listed species and how to recognize and avoid impacts to these species.

In summary, we continue to recognize that Florida bonneted bats may occur in the project area due to the detection of this species at the nearby acoustic monitoring sites and the suitable foraging wetlands that occur in the project area. Presence of roosting bats would be evaluated during the threatened and endangered species survey prior to construction. Should the Florida bonneted bat or evidence of recent roosting activity be detected during the survey and show potential for bats to be affected by the project, consultation with the U.S. Fish and Wildlife Service would be reinitiated. Short-term, minor effects are expected to be limited to temporary disturbance during construction, and potentially reduced foraging habitat in the immediate vicinity of the bridge. In response, if bats are present in the project area, they are expected to move to adjacent high quality foraging areas. These effects are anticipated to be insignificant and discountable. Due to the small but permanent impacts to potential Florida bonneted bat foraging habitat, long-term, minor, localized impacts to the Florida bonneted bat would be anticipated with implementation of the Modified Alternative.

Everglades bully

Everglades bully is a newly listed low-growing woody shrub that is primarily associated with pine rockland and marl prairie communities. The species is not known to occur in or near the project area, but surveys in the vicinity have not been conducted. While the soil characteristics and associated species are generally absent from the project site, there is some potential that this species may occur intermittently in shallowly-inundated areas along slough margins, or on previously disturbed sites, possibly including sites like the existing Tamiami Trail road bed.

General mitigation measures for threatened and endangered species will be followed during implementation of Phase 2 and includes the following:

- Pre-construction surveys would be conducted to identify any federal- and state-listed species occurring in the project area. Should any individuals or active breeding sites be identified, additional protective measures would be taken to avoid impacts (e.g., providing additional information to contractors about the species).
- The Florida Fish and Wildlife Conservation Commission (FFWCC) and the U.S. Fish and Wildlife Service would be notified of the presence of these species in the project area.
- During the environmental training, construction contractors would receive training on federally- and state-listed species and how to recognize and avoid impacts to these species.

If surveys conducted prior to construction identify the species as present, additional consultation may be required. However we believe occurrence is unlikely, and the effects of the project would be similar to those for the Cape Sable seaside sparrow, consisting primarily of minor changes in hydrology and habitat suitability where the species occurs downstream of the project area. The NPS determined that these effects would be insignificant and discountable, and the FWS concurred with the determination that the project may affect, but is not likely to adversely affect the Everglades bully. Effects would be limited to short-term minor changes in habitat suitability.

“No Effect” Determinations

Bartram's scrub-hairstreak butterfly

The Bartram's scrub-hairstreak butterfly was listed as endangered and had critical habitat designated in August 2014 (FWS 2014). Survey data indicate the range of the Bartram's scrub-hairstreak butterfly is restricted to the pine rockland habitat of Miami-Dade and Monroe counties in Florida (FWS 2014). The distribution of the Bartram's scrub-hairstreak is thought to be restricted to pine rockland habitat that contains its only known larval host plant, the pineland croton (FWS 2014). Proposed critical habitat for the Bartram's scrub-hairstreak occurs within the Long Pine Key region of Everglades National Park and also outside of Everglades National Park at the Navy Wells Pineland Preserve, Camp Owaissa Bauer, Big Pine Key, No Name Key, and Little Pine Key (FWS 2013).

Pine rockland habitat and pineland croton does not occur within the Phase 2 project area, and the project does not occur in proposed critical habitat of the Bartram's scrub-hairstreak butterfly.

Florida leafwing butterfly

The Florida leafwing butterfly was also listed as endangered and had critical habitat designated in a joint listing with the Bartram's Hairstreak, published in August 2014 (FWS 2014). Survey data indicate the range of the Florida leafwing butterfly is currently restricted to Everglades National Park, and its historic range was limited to Miami-Dade and Monroe counties in Florida (FWS 2014). The distribution of the Florida leafwing is thought to be restricted to pine rockland habitat that contains its only known larval host plant, the pineland croton (FWS 2014). Proposed critical habitat for the Florida leafwing butterfly occurs within the Long Pine Key region of Everglades National Park and also outside of Everglades National Park at the Navy Wells Pineland Preserve, the Richmond Pine Rocklands, and Big Pine Key (FWS 2013).

There are no records of Florida leafwing in the project area, and pine rockland habitat and pineland croton does not occur within the Modified Alternative project area. No proposed critical habitat for the Florida leafwing butterfly occurs within the project area.

Blodgett's silverbush

The threatened Blodgett's silverbush was listed as threatened in September, 2016. It is an erect perennial shrub or herb that grows up to 24 inches tall. This species grows in pine rockland, in sunny gaps or edges of rockland hammock, coastal berm and on roadsides. It's currently known to exist from central Miami-Dade County from Coral Gables and southern Miami-Dade County to Long Pine Key in Everglades National Park. There are no known occurrences of this species in or near the project area, and the only known occurrence within Everglades National Park is within the pine rocklands of Long Pine Key, outside of the area that will be affected by this project. Consequently, the NPS believes phase 2 will have no effect on this species.

Pineland sandmat

Pineland sandmat is a pine rockland endemic plant that was listed as threatened in October, 2017. Pineland sandmat is a small perennial herb, with greenish oval-shaped leaves and reddish stems. The extensive root system of pine sandmat indicates that it is a long-lived plant. The

species will flower and fruit year-round, with peaks in the fall, as well as after stimulation after fire. This species can be found in pine rocklands, marl prairies, and within the ecotone between both habitats in Miami-Dade County. The current range of this species consists of 20 populations in Miami-Dade County, including the largest population in the vicinity of Long Pine Key within Everglades National Park. This species is not expected to occur in or near the project area, and the closest occurrences are well outside of the area of influence of this project. Consequently, the NPS believes the Phase 2 project will have no effect on this species.

Cape Sable thoroughwort

The endangered Cape Sable thoroughwort is restricted to southern Florida and occurs within coastal berm, coastal rock barrens, coastal hardwood hammocks, rockland hammock, and buttonwood forest habitats located from the Coastal Prairie Trail in Everglades National Park near the southern tip of Cape Sable to Madeira Bay, and in the Florida Keys (FWS (b) 2014). This species has been extirpated from approximately half of its historical distribution in the Florida Keys but still occupies its historical habitat range in Everglades National Park. Critical habitat for this species has been designated within Everglades National Park along the southern coast of Florida from Cape Sable to Trout Cove, and within the Florida Keys (FWS (b) 2014). This species and its critical habitat do not occur within Modified Alternative project area.

Florida prairie clover

Florida prairie-clover was listed as endangered in October 2017. It is a perennial shrub that grows to about three to six feet tall, with a light brown woody stem and non-woody, light brown or reddish branches. Its flowers are whitish, but turn maroon with age. Fruit is produced small, hairy, one-seeded pods. This species can be found in pine rocklands, rockland hammocks, marl prairies, adjacent roadsides and within the ecotone between these habitats. Florida prairie-clover is found within Big Cypress National Preserve, as well as seven locations in Miami-Dade County. One location was recently discovered within Everglades National Park in a rockland fragment along the road to Mahogany Hammock. The species was previously thought to have been extirpated from Everglades National Park. This species is not expected to occur in or near the project area, and the closest occurrences are well outside of the area of influence of this project. Consequently, the NPS believes the Phase 2 project will have no effect on this species.

Florida pineland crabgrass

Florida pineland crabgrass was also listed as threatened in October, 2017. It is a small perennial clumping grass, blue-green to gray in color with hairy, reddish-brown stems. The plant's flowers are dull green and very small. It is found in pine rocklands, marl prairies, and within the ecotone between both habitats. Florida pineland crabgrass lives only within the Long Pine Key region of Everglades National Park and the Lostman's Pines region of Big Cypress National Preserve. The species had disappeared from historic Miami-Dade County locations adjacent to ENP, due largely to habitat loss. This species is not expected to occur in or near the project area, and the closest occurrences are well outside of the area of influence of this project. Consequently, the NPS believes the Phase 2 project will have no effect on this species.

Florida bristle-fern

The Florida bristle-fern was listed as endangered in 2015. This small fern grows in humid microclimates within rockland hammock vegetation communities in Miami-Dade County. It had been reported from a hammock within long Pine Key in Everglades National Park, but is now considered extirpated, and has not been recorded in the park for many years. The proposed project area does not contain suitable habitat, and there are no occurrences in the vicinity. Consequently, the NPS believes phase 2 will have no effect on this species.

f. Wilderness Impacts

In 1978, the US Congress designated nearly 86 percent of the lands and waters within ENP as federally designated Wilderness. In 1997 this area was named the Marjory Stoneman Douglas Wilderness, and now includes 1,296,500 acres. The Tamiami Trail Next Steps project is located along the northern border of the East Everglades, and 85,300 acres of this region was evaluated in the 2015 ENP Final General Management Plan/East Everglades Wilderness Study (NPS 2015). A ¼-mile buffer adjacent to the Tamiami Trail roadway was determined to be ineligible for the Wilderness designation, so the Phase 2 construction activities will have a lesser impact on the adjacent areas that are currently managed as Wilderness.

Minor short-term impacts from construction-related noise and vibration would be experienced in wilderness areas adjacent to the Tamiami Trail project area. Construction-related noise impacts and abatement/mitigation measures were thoroughly evaluated for this project in the Final EIS. Generally, construction-related noise and vibration would comply with all noise regulations and would be limited to the project area and close proximity only during periods of active construction. Wilderness areas could also temporarily experience indirect effects from construction-related noise and vibration impacts that could cause wildlife to flee from construction areas and the close proximity. These adverse effects are expected to be limited to the timeframe of construction and wildlife is expected to fully return to the project area following completion of construction activities. Therefore, these adverse impacts to wilderness and the wilderness visitor experience are expected to be minor and short-term in nature.

Air quality in the area within the project corridor is a valuable park resource, enhancing visitation quality by providing clean air and high visibility to match the unique ecosystem experience. Everglades National Park is a designated Class I air-shed, which dictates the most stringent air quality regulations for the park that only permit very limited increases in pollution in the vicinity. Short-term emissions generated from transport and construction equipment would be mitigated and would not measurably contribute adversely to air quality conditions or adversely affect visitor use and experience conditions. Because of the high water table, it is unlikely that large quantities of dust would be generated, and any occurrence of fugitive dust would be localized and very transient. If needed, BMPs for dust suppression would be initiated. Emissions from construction equipment would be kept to a minimum by restricting idling time. Therefore, adverse impacts to wilderness and the wilderness visitor experience as a result of construction-related dust would be negligible.

Finally, minor short-term adverse effects to the visual aesthetics of wilderness would be experienced by visitors along the project corridor. While many visitors to ENP want to

experience the unique visual aesthetics of the wilderness area, the views on both sides of the project segment along Tamiami Trail are somewhat limited and constrained by the L-29 Canal, the L-29 Levee, several water control structures, and dense native and invasive exotic vegetation. Therefore, the short-term impacts of the visual presence of construction vehicles and heavy equipment in construction zones along the project corridor should only cause minor disturbances to wilderness and the wilderness visitor experience.

g. Wildlife and Vegetation/Habitat Impacts

The NPS Organic Act of 1916 and the NPS *Management Policies 2006* (NPS, 2006) direct the NPS to provide for the protection of park resources. The NPS *Management Policies 2006* state that “the Service would not attempt to solely preserve individual species (except threatened or endangered species) or individual natural processes; rather, it would try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems. Just as all components of a natural system would be recognized as important, natural change would also be recognized as an integral part of the functioning of natural systems.”

In the areas directly adjacent to the Phase 2 project area, noise associated with construction, and the presence of construction personnel would temporarily disperse wildlife to adjacent habitats although it is unlikely that changes to community or population dynamics would occur. Erosion, sedimentation, and potential petroleum spills from equipment have the potential to cause pollution in surface waters that could adversely affect wildlife that utilize surface waters in the project area. However, erosion control BMPs would minimize impacts, including the installation and inspection of silt fences, hay bale barriers, sediment traps, or other equivalent measures.

There are three active wading bird colonies within the vicinity of the Phase 2 project area, and effects to wading bird species and anhingas nesting within these colonies are anticipated to range from short to long-term and are at the moderate impact level. No permanent loss of wading bird nesting, loafing, roosting, and foraging habitat would result from construction activities. We would expect a similar level of impacts for other avian species that may be nesting within the project area. Construction of the Phase 2 plan would result in temporary and permanent loss of useable habitat by wildlife with effects that are anticipated to range from short to long term, and range from minor to moderate, dependent on the species. This could result in a loss of breeding, foraging, roosting, loafing, shelter, and/or ranging habitat. Based on availability of other useable habitat in the vicinity of the project area, the scale of the project, and the ability of wildlife to move away from disturbance activities, it is estimated that habitat losses resulting from implementation the Phase 2 plan would be minor for most fish, invertebrates, mammals, amphibians, and reptiles.

The ability for wildlife to move between habitat components is crucial for maintaining wildlife population health and diversity. Tamiami Trail has long represented a barrier to wildlife movement to the north and south and the construction of the large culverts in the Phase 2 plan would provide improved access for species to move between habitats in the WCAs and Northeast Shark River Slough. The deaths of small animals from collision with vehicles would continue to

occur in the unbridged sections of Tamiami Trail. The mortality of wetland dependent amphibians and reptiles and potentially some mammals would be somewhat reduced by the large culverts.

h. Cultural Resources Impacts

The primary law related to preserving cultural resources is the NHPA of 1966, as amended. Section 106 of this act requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing in the National Register of Historic Places (NRHP). The cultural resources that could be impacted by the Phase 2 project include the historic Tamiami Trail roadway originally constructed in 1928, several historic commercial structures located along the south side of the roadway, the Miccosukee Osceola Camp, as well as visual and access modifications to these properties.

Tamiami Trail Roadway Impacts

Tamiami Trail is an historic roadway completed in 1928, and it is eligible for listing on the NRHP. Elements of the Trail are susceptible to adverse impacts or damage due to increased water levels, changes to the embankments intended to protect roadway safety or stability, and the direct removal/destruction of the roadway to construct bridges or install smaller conveyance features. The expected impacts to the roadway under the four Phase 2 alternatives are linked to the extent of the roadway that is permanently destroyed by the construction of additional bridges, and the associated roadway removal (Table 14).

Table 14. Miles of Highway Adversely Affected or Protected.

Alternative	Roadway Adversely Effected (Total Bridge Length in miles)	Roadway Protected (Roadway Retained in miles)
No-Action	3.3	7.4
1	6.5	4.2
2	3.4	7.3
3	3.3	7.4

The 2010 Final EIS concluded that construction of the recommended Alternative 6e (which included 5.5-miles of additional bridging and reconstruction of the remaining roadway) would have major, adverse, effects on the roadway. The Phase 2 recommended plan, with its six large culverts would add approximately 0.1-miles of additional impact compared to the no-action plan. The recommended plan would have much less impact vs the Original plan, since the 2.8-miles of additional bridging would not be constructed. Consequently, there would be no additional impairment of the Tamiami Trail cultural resources as a result of implementation of the Phase 2 plan (Alternative 2).

Historic Property Impacts

Several historic properties just south of the Tamiami Trail are also susceptible to adverse impacts or damage resulting from this project. A cultural resources evaluation of properties

located within the project corridor was conducted in July 2009. This evaluation found two properties, the Coopertown Restaurant and Airboat Rides and the Airboat Association of Florida, the Miccosukee Osceola Camp, is potentially eligible for listing in the NRHP.

There would be no direct impacts to historic structures on these properties from the Phase 2 recommended alternative. Increasing the roadway height by approximately three feet will expand the ROW southward, resulting in possible loss of usable land areas around the two historic properties and the Osceola Camp, due to their proximity to the project corridor. Since the roadway raising in this recommended Phase 2 plan is much less than the originally planned bridging, there should be no loss of property visibility, which is very important to commercial enterprises. Table 15 below summarizes the expected impacts to these historic properties.

Table 15. Impact Determinations for Historic structures/Properties

Alternative	Airboat Association of Florida	Osceola Camp	Coopertown Airboats
No-Action	No Impact	No Impact	No Impact
1	Minor Impact	Minor Impact	Minor Impact
2	Minor Impact	Minor Impact	Minor Impact
3	Minor Impact	Minor Impact	Minor Impact

The Phase 2 recommended plan would include raising the associated entrance roads and parking areas to harmonize these areas with the raised roadway elevation. The Phase 2 plan would therefore be expected to have minor, short-term effects on access to these properties during construction, compared to the no-action alternative. Overall the project would have minor long-term adverse effects on these properties and business, after construction and operation of the project. The historic property impacts are considered minor and adverse (the same determination in the 2010 FEIS), but there are no new adverse impacts under the Phase 2 recommended alternative.

8. Conclusions

The general conclusion from this Confirmation of Previous Analysis is that the Phase 2 Recommended Plan (Alt. 2) meets the purpose and need of the TT:NS Project and will result in improvements to the natural resource conditions within Everglades National Park that are generally comparable to the Original Plan (Alt. 6e in the 2010 Final EIS):

- a. This 2018 re-analysis confirms that the Phase 2 recommended alternative, that would complete the Tamiami Trail Next Steps project, is consistent with the benefit analyses and impact determinations included in the 2010 Final EIS.
- b. Re-evaluation of the hydrologic benefits of Tamiami Trail bridging determined that the existing 3.3 miles of bridging (the combination of the MWD/LRR and TT:NS Phase 1) represents an optimal bridging plan, and would provide sufficient water conveyance capacity to pass future CERP restoration flows.

- c. The No-Action alternative (which does not reconstruction/raise the remaining 6.5-miles of roadway) would constrain future L-29 Canal stage increases, limiting future restoration benefits in both the upstream Water Conservation Areas and ENP.
- d. The Choosing by Advantages analysis reiterated that the Original Plan from the 2010 Final EIS, with 6.5-miles of total bridges, scored better on restoring sheetflow, and reducing wildlife mortalities, but only slightly better on marsh connectivity, and recreating marsh flow velocities.
- e. The Phase 2 Recommended Plan (Alt. 2), with 3.3-miles of bridging and six large culverts, scored higher of reconnecting historic sloughs, and met the original project objectives for unconstrained flows, marsh connectivity, restoring sheetflow, and recreating marsh flow velocities, given the L-29 Levee removal limitations expected in the Central Everglades Project's recommended plan.
- f. The Phase 2 Recommended Plan would have 6.8 fewer acres of permanent wetland impacts compared to the 2010 Original Plan, and results in no temporary wetland impacts compared to 22.4 acres in the Original Plan, by constraining all construction activities within the new roadway and swale footprint.
- g. Seventeen threatened and endangered (T&E) species were evaluated in this analysis, with ten that were newly listed and/or not evaluated in the 2010 Final EIS. Only two of these previously evaluated species, the Wood stork (*Mycteria Americana*) and the Florida panther (*Puma concolor coryi*) had Likely to Adversely Affect determinations. Since the wetland impacts under the Recommended Plan (Alt. 2) were lower than the Original Plan (Alt. 1), losses to T&E species habitat would be less, but this did not change the effect determinations.
- h. The cultural resource impacts to the Tamiami Trail roadway under the Recommended Plan would be less than the Original Plan, since 2.8-miles of additional bridging would not occur. There would still be no direct impacts to historic structures, but adjacent entrance roads and parking areas would be reconstructed to match the raised roadway.
- i. Life Cycle Costing analyses determined that replacing 2.8-miles of additional bridging with six larger culverts, as well as the other recommended modifications, lowers the total project cost by more than \$118 million, while achieving 78% of the benefits (maximum importance value).
- j. The Phase 2 Recommended Plan includes roadway improvements that will increase driver safety by widening and fully paving the shoulders. The paved shoulders create opportunities for improved traffic flow during emergencies, such as hurricane evaluations.
- k. The reconstructed roadway in the Phase 2 Recommended Plan will improve roadway stability throughout its 100-year lifespan, and can better withstand major high water events, and the impacts of climate change. The Phase 2 project shortens the construction duration by 1.5 years, ensures a higher quality of life for rural and tribal

communities, and provides reliable access to economically and culturally important sites.

Table 16. Summary of Environmental Consequences for each of the VA Workshop Alternatives.

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	No-Action Phase 1 completed. 3.3-Total Miles of Bridging and 1.5-Miles of Approaches) No Additional Phase 2 Road Work	Alternative 1 Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	Alternative 2 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Six Large Culverts, Remaining Culverts Replaced In-Kind	Alternative 3 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Culverts Replaced In-Kind
Geology, Topography, and Soils	Taking no action would cause no additional direct or indirect effects on geology, topography, or soils, beyond the 2008 LRR and TT:NS Phase 1 projects. The geology, topography, and soils in the project area would slowly improve. There would be no impairment to geology, topography, or soils as a result of the No-Action Alternative.	Effects on soils are related to short-term and long-term construction, operations, and maintenance activities. The soil impacts resulting from temporary construction related activities would be adverse, local, minor, and short-term . Long-term impacts resulting from implementing Alternative 1 would be adverse, local, and minor . No impairment of soils is anticipated from construction and maintenance-related activities.	Same as Alternative 1, with minor incremental differences due to bridge and roadway lengths.	Same as Alternative 1, with minor incremental differences due to bridge and roadway lengths.
Water Resources, Hydrology	Under the No-Action Alternative, there would be no additional direct or indirect short- or long-term impacts on hydrology, beyond the 2008 LRR and TT:NS Phase 1 projects. The project area will begin to slowly recover from the altered prior hydrologic conditions that existed in Northeast SRS. There would be no impairment to hydrology as a result of the No-Action Alternative.	Alternative 1 will have a short-term, adverse, minor, localized impact on hydrology associated with project construction. A Long-term, beneficial effect on hydrology based on its capacity to convey full CERP flows at relatively low velocities. No impairment to hydrology as a result of implementation of Alternative 1.	Same impact as Alternative 1, with Incremental differences due to bridge length. A Long-term, beneficial effect on hydrology based on its capacity to convey full CERP flows at relatively low velocities.	Same impact as Alternative 1, with Incremental differences due to bridge length. A Long-term, beneficial effect on hydrology based on its capacity to convey full CERP flows at relatively low velocities.
Water Resources, Water Quality	With no action, there would be no additional direct or indirect short- or long-term effects on water quality, beyond the LRR/Phase 1. The water quality in the project area would remain	Water quality effects would be directly related to the short-term and long-term effects caused by construction, operations, and maintenance. It is anticipated that the water quality impacts resulting from construction-related activities would be adverse, local, minor, and short-term . No long-term	Same impacts as Alternative 1, with Incremental differences due to bridge length. A Long-term, beneficial effect on water quality,	Same impacts as Alternative 1, with Incremental differences due to bridge length.

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	No-Action Phase 1 completed. 3.3-Total Miles of Bridging and 1.5-Miles of Approaches) No Additional Phase 2 Road Work	Alternative 1 Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	Alternative 2 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Six Large Culverts, Remaining Culverts Replaced In-Kind	Alternative 3 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Culverts Replaced In-Kind
	unchanged. No short- or long-term negative or beneficial effects to water quality would result. There would be no water quality impairment under the No-Action Alternative.	impacts to water quality are anticipated, but stormwater runoff could improve due to water quality treatment features in Alternative 1. No impairment of water quality resources/ values would occur from the implementation of Alternative 1.	based on the addition of swales to handle roadway stormwater runoff.	
Water Resources, Wetlands	With no action, there would be no additional direct or indirect short- or long-term effects on wetlands beyond the 2008 LRR and TT:NS Phase 1 projects. The wetlands would remain unchanged. The current un-natural hydrologic conditions would slowly improve following MWD and C-111 project implementation, but water flows would be limited, so a significant portion of the Northeast SRS wetlands would continue to be over-drained. Wetland values and functions within Northeast SRS Slough would slightly improve. No additional short- or long-term negative effects to wetlands would result from the selection of the No-Action Alternative. There would be no impairment of wetland functions and values as a result of the No-Action Alternative.	Alternative 1 results in approximately 31 acres of permanent wetland loss and 22 acres of temporary wetland loss. Some portion of the permanent loss would be offset by the creation of new wetlands/open water areas from the removal of the old roadway. This translates to moderate, adverse, short-term, localized impacts to wetlands during project construction. There would be moderate, adverse, long-term, localized impacts to wetlands associated with permanent dredging and filling of wetlands in conjunction with raising of the Tamiami Trail roadway. A Long-term, beneficial effect would be expected to result from future CERP improved water flows would substantially improve wetland functions throughout Northeast SRS. No impairment of wetland resources/ values would occur from the implementation of Alternative 1.	Same impacts as Alternative 1, with incremental differences due to bridge length. Moderate, adverse, short-term, localized impacts to wetlands during project construction. Moderate, adverse, long-term, localized impacts to wetlands associated with raising the Tamiami Trail roadway. A Long-term, beneficial effect would be expected to result from future CERP improved water flows would substantially improve wetland functions throughout Northeast SRS.	Same impacts as Alternative 1, with incremental differences due to bridge length. Moderate, adverse, short-term, localized impacts to wetlands during project construction. Moderate, adverse, long-term, localized impacts to wetlands associated with raising the Tamiami Trail roadway. A Long-term, beneficial effect would be expected to result from future CERP improved water flows would substantially improve wetland functions throughout Northeast SRS.
Wildlife and	With no action, there would be no	Short-term to long-term, minor to moderate,	Same impacts as	Same impacts as

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	No-Action Phase 1 completed. 3.3-Total Miles of Bridging and 1.5-Miles of Approaches) No Additional Phase 2 Road Work	Alternative 1 Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	Alternative 2 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Six Large Culverts, Remaining Culverts Replaced In-Kind	Alternative 3 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Culverts Replaced In-Kind
Vegetation, Habitat	additional direct or indirect short- or long-term impacts on wildlife or vegetation/habitats beyond the 2008 LRR and TT:NS Phase 1 projects. The current un-natural hydrologic conditions would slowly improve following MWD and C-111 project implementation, but water flows would be limited, so wildlife and their habitat would continue to be impacted. Wildlife movement between the WCAs and ENP would be limited. No short- or long-term adverse effects would result from the selection of the No-Action Alternative. No impairment to wildlife and vegetation/habitats as a result of the No-Action Alternative.	adverse, localized impacts to wildlife and vegetation/habitats would result from the construction of Alternative 1. Long-term beneficial effects to wildlife and habitat would result from the increased ecological connectivity provided through the implementation of Alternative 1, in combination with future CERP projects. Consequently, there would be no impairment of wildlife and habitat as a result of Alternative 1.	Alternative 1, with Incremental differences due to bridge length. Moderate, adverse, short-term, localized impacts to wildlife and habitat during project construction. Moderate, adverse, long-term, localized impacts to wildlife and habitat after construction. A Long-term, beneficial effect would be expected to result from future CERP.	Alternative 1, with Incremental differences due to bridge length. Moderate, adverse, short-term, localized impacts to wildlife and habitat during project construction. Moderate, adverse, long-term, localized impacts to wildlife and habitat after construction. A Long-term, beneficial effect would be expected to result from future CERP.
Special Status Species	With no-action, there would be no additional direct or indirect short- or long-term impacts on special status species beyond the 2008 LRR and TT:NS Phase 1 projects. The current unnatural altered hydrologic conditions within the vicinity of the project area would slowly improve following MWD and C-111 project implementation, but water flows would be limited, so special species and their habitat would continue to be impacted. No short- or long-	Short-term to long-term, minor to moderate, adverse, impacts to special status species would result from the construction of Alternative 1. This Alternative may affect but is not likely to adversely affect the Cape Sable seaside sparrow, Everglade snail kite, Eastern black rail, Florida bonneted bat, Everglades bully, West Indian manatee, and Eastern indigo snake. The Alternative is likely to adversely affect the Wood stork, and Florida Panther. Alternative 1 does include construction within the buffer zones of existing wood stork colony sites, and the bridge construction impacts would be adverse, but short term . Alternative 1 will have moderate	Same impacts as Alternative 1, with Incremental differences due to bridge length. Moderate, adverse, short-term, localized impacts to special species and their habitat during project construction. Moderate, adverse, short-term, localized impacts to special species after construction. A	Same impacts as Alternative 1, with Incremental differences due to bridge length. Moderate, adverse, short-term, localized impacts to special species and their habitat during project construction. Moderate, adverse, short-term, localized impacts to special species after construction.

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	No-Action Phase 1 completed. 3.3-Total Miles of Bridging and 1.5-Miles of Approaches) No Additional Phase 2 Road Work	Alternative 1 Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	Alternative 2 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Six Large Culverts, Remaining Culverts Replaced In-Kind	Alternative 3 Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Culverts Replaced In-Kind
	term adverse or beneficial effects to special status species would result from the selection of the No-Action Alternative. Consequently, there would be no impairment to special status species as a result of the No-Action Alternative.	short-term impacts to Florida panther habitat. No impairment of special status species is expected as a result of implementation of Alternative 1.	Long-term, beneficial effect for the Florida panther is expected as a result of the six large culverts.	
Cultural Resources	With no-action, there would be no additional direct or indirect short- or long-term impacts on cultural beyond the 2008 LRR and TT:NS Phase 1 projects. No short- or long-term adverse or beneficial effects to cultural resources would result from the No-Action Alternative. Consequently, there would be no impairment of cultural resources as a result of the No-Action Alternative.	There would be significant, adverse, long-term effects on the historic Tamiami Trail roadway associated with construction of 2.8-miles of additional bridges. There would be minor, adverse, short-term effects associated with construction to improve the entrance roads and parking area at three historic sites. Consequently, there would be impairment of cultural resources as a result of implementation of Alternative 1.	There would be minor adverse short-term effects on the Tamiami Trail roadway, entrance roads, and parking areas as a result of construction.	There would be minor adverse short-term effects on the Tamiami Trail roadway, entrance roads, and parking areas as a result of construction.
Transportation	With no-action, there would be no additional direct or indirect short- or long-term impacts on transportation beyond the 2008 LRR and TT:NS Phase 1 projects. Transportation and traffic would be expected to remain the same. No short- or long-term adverse or beneficial effects to transportation would result from the No-Action Alternative.	Transportation impacts associated with Alternative 1 would be adverse, local, minor, and short term and primarily associated with traffic delays related to construction activities. Mitigation of these effects would be through implementation of a Maintenance of Traffic plan. No long-term impacts associated with increases in traffic levels are expected. Construction duration: 3-5 years, most likely done in multiple phases.	Same or less adverse impacts compared to Alternative 1. Adverse, local, minor, and short term effects would occur primarily due to traffic delays related to construction activities. Construction duration: 2-3 years, all done at one time.	Same impacts as Alternative 2, with Incremental differences due to bridge and roadway lengths. Construction duration: 2-3 years, all done at one time.

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10. Appendix A. Value Analysis Final Report for Tamiami Trail Next Steps Phase 2 Project, National Park Service (September, 2018)