



**Modified Water  
Deliveries Project –  
Tamiami Trail Update**



restoration  
restoration

WRAC/Task Force Meeting

December 5, 2007

# Tamiami Trail Update

- Background
- Spreader Swales Pilot Project
- Alternatives Re-Analysis

# **PROJECT OVERVIEW**

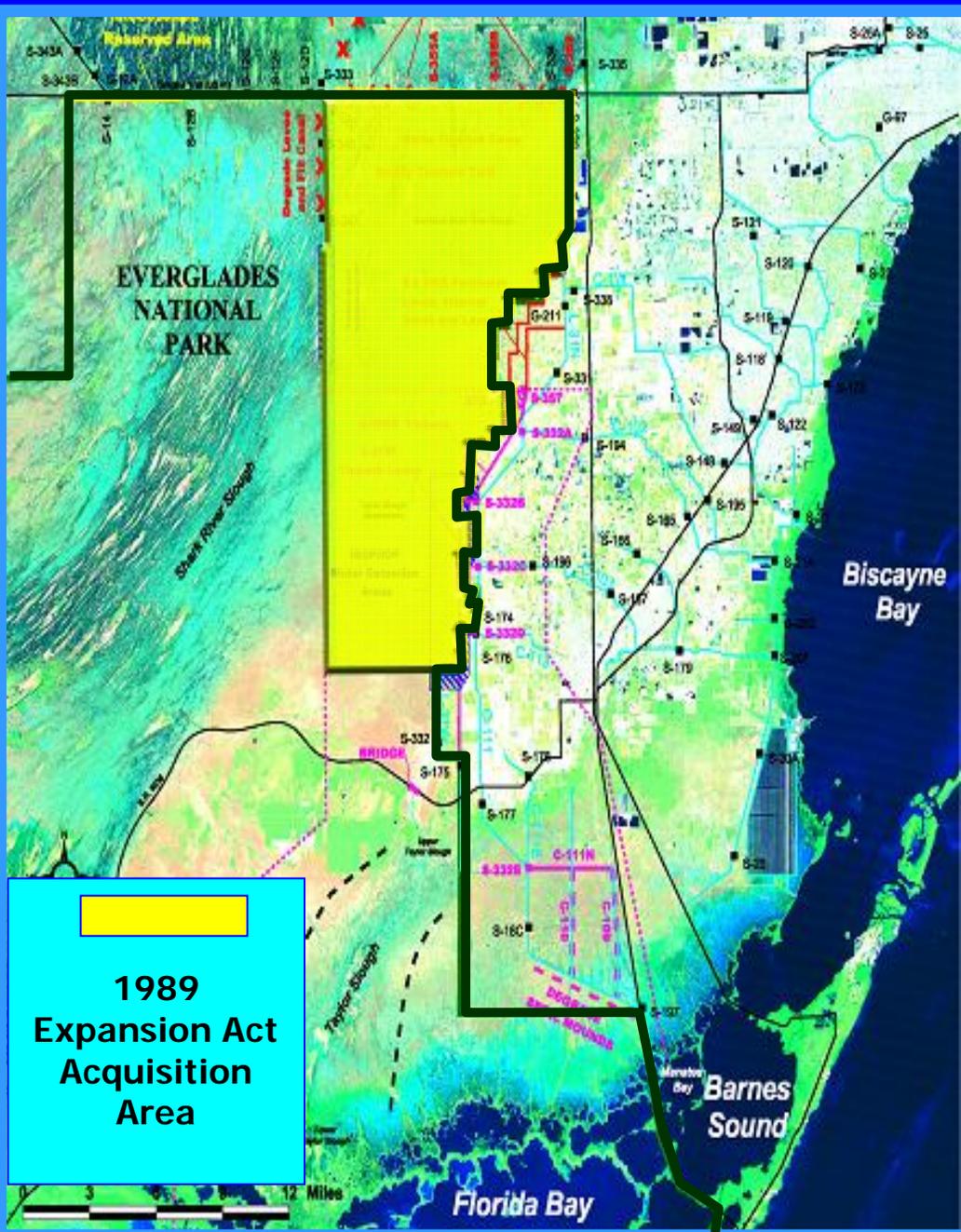
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**Modified Water Deliveries to Everglades National Park**

# Modified Water Deliveries Authorization

The Everglades National Park Protection and Expansion Act of 1989....

- Authorized the acquisition of 109,000 acres
- Authorized the Secretary of the Army to make modifications to C&SF Project “to improve water deliveries into the park and shall, to the extent practicable, take steps to restore the natural hydrological conditions within the Park.”



# MWD Project

WCA 3A

L-67A  
L-67C

WCA 3B

Tamiami Trail

ENP

North East Shark River  
Slough

8.5  
SMA

# Modified Water Deliveries Project



## Conveyance Features

- S-355A & S-355B (L-29): Complete
- S-333 Mods: Complete
- L-67 Extension: 4 of 9 miles complete
- Tamiami Trail: Re-analysis underway
- L-67A: S-349s & S-345s: EDR
- L-67C: Gaps: EDR
- L-29: Weirs: EDR

## Seepage Features

- S-356 (L-31N): Complete (Temp)

## Mitigation Features

- 8.5 Square Mile Area: Construction
- Tigertail Camp: Complete
- Osceola Camp: DOI Negotiations

## Other Project Activities

- CSOP: On Hold

# Tamiami Trail

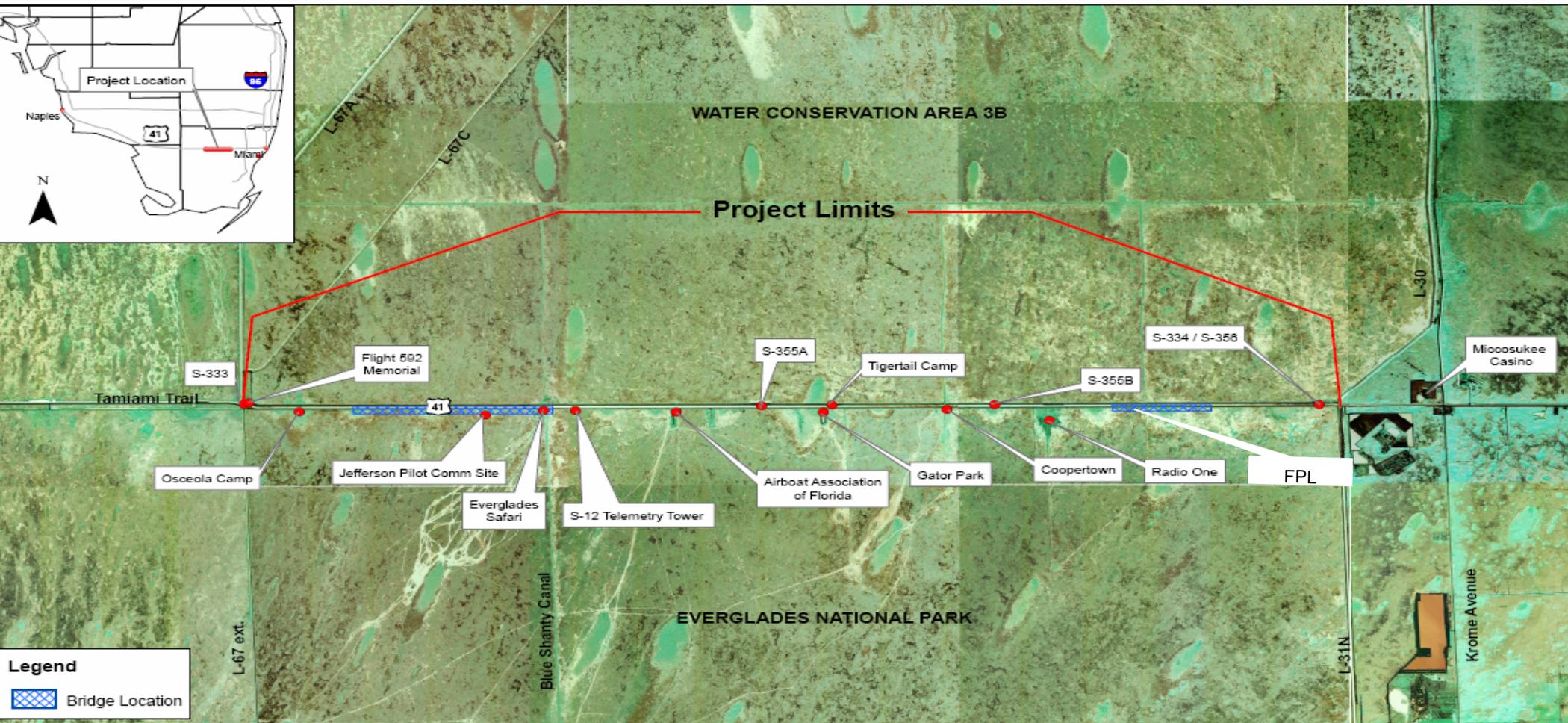
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Modified Water Deliveries to Everglades National Park

# Tamiami Trail History

- 1989 - Everglades National Park Expansion Act
- 1992 - General Design Memorandum (GDM)
  - Tamami Trail: Assumed existing culverts sufficient to pass flows
  - 8.5 SMA: Land acquisition limited to original perimeter levee
- 2003 Dec - GRR for Tamiami Trail
  - Recommended 3,000 foot bridge and increased roadway elevations
  - Withdrawn after public and agency comments
- 2005 Nov - RGRR & SEIS for Tamiami Trail
  - ROD signed January 2006 (2-mile and 1-mile bridges)

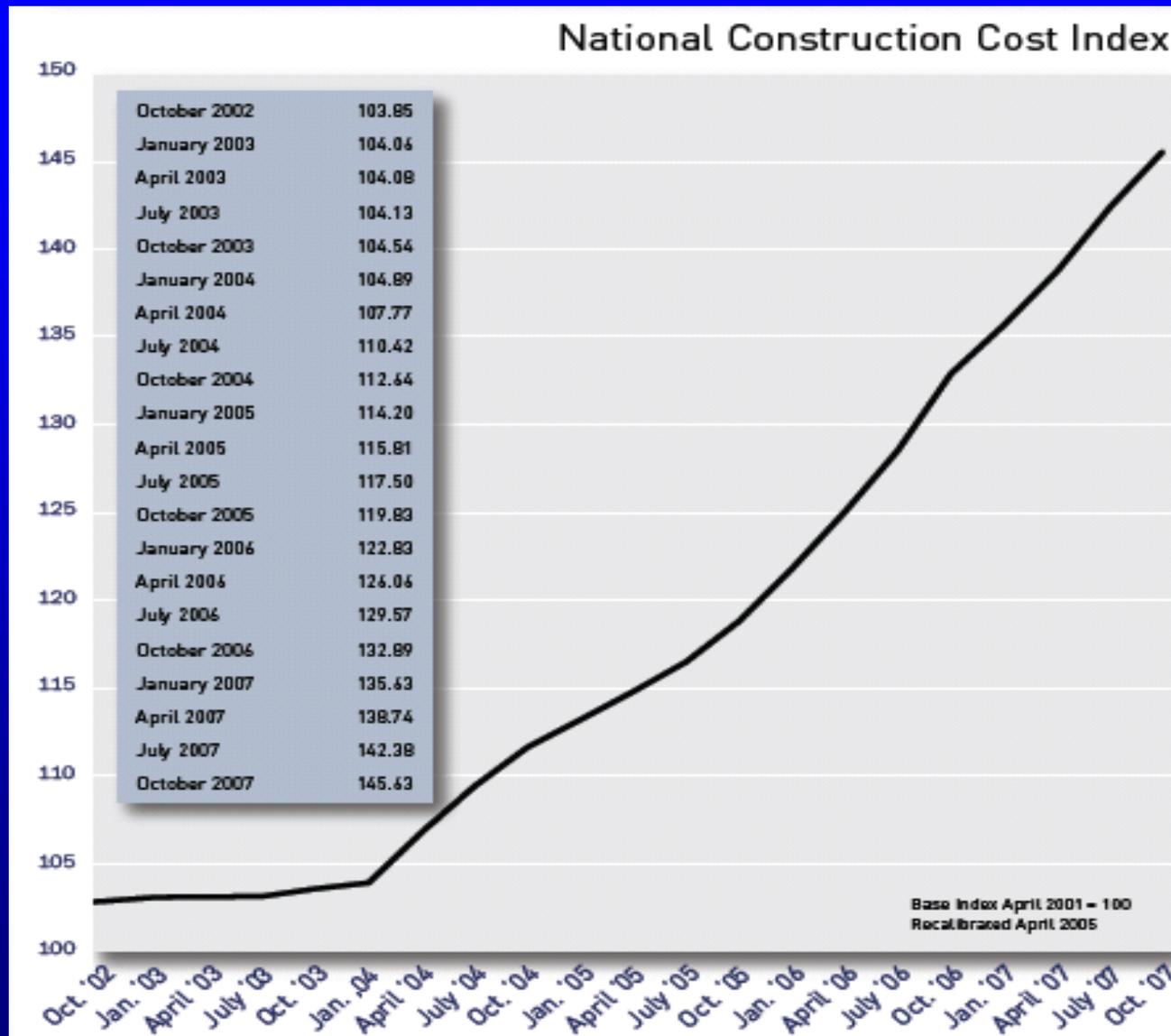
# Tamiami Trail Approved Plan 2-mile Bridge West and 1-mile Bridge East



**ALTERNATIVE 14**  
 Two-Mile Bridge West and One Mile Bridge East (Recommended Plan)  
 Revised General Re-evaluation Report / Supplemental Environmental Impact Statement, Tamiami Trail  
 Modified Water Deliveries to Everglades National Park, Florida  
 Quadrangle Coopertown NW/NE (1999)

**GEC**  
 Figure: 10  
 Date: August 2005  
 Scale: 1 inch equals 1 mile  
 Source: GEC  
 Map Author: G. Sigrest

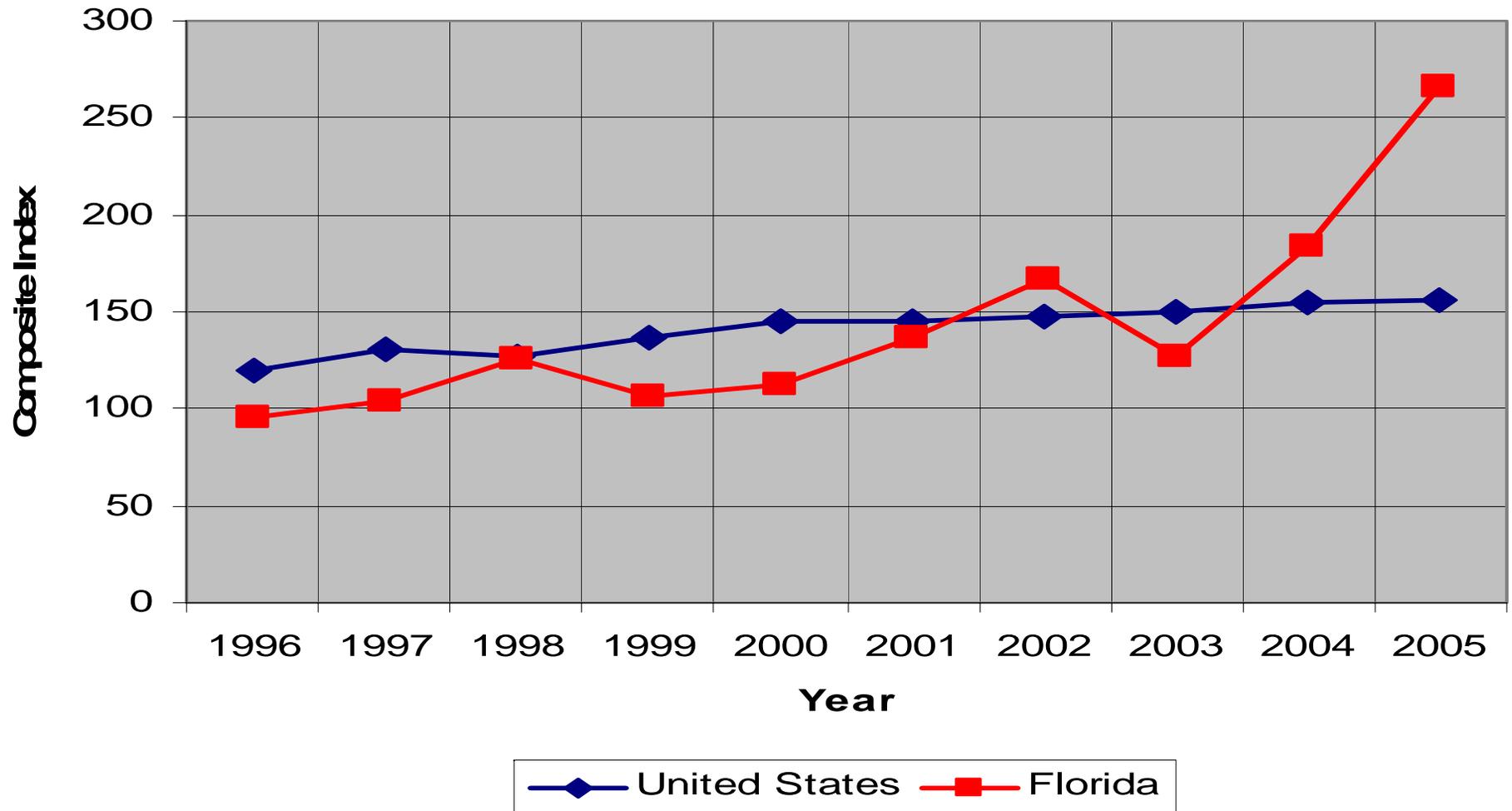
# Construction Cost Growth



Source: Quarterly Construction Cost Report, 2007 Fourth Quarter Issue

Rider Levett Bucknall

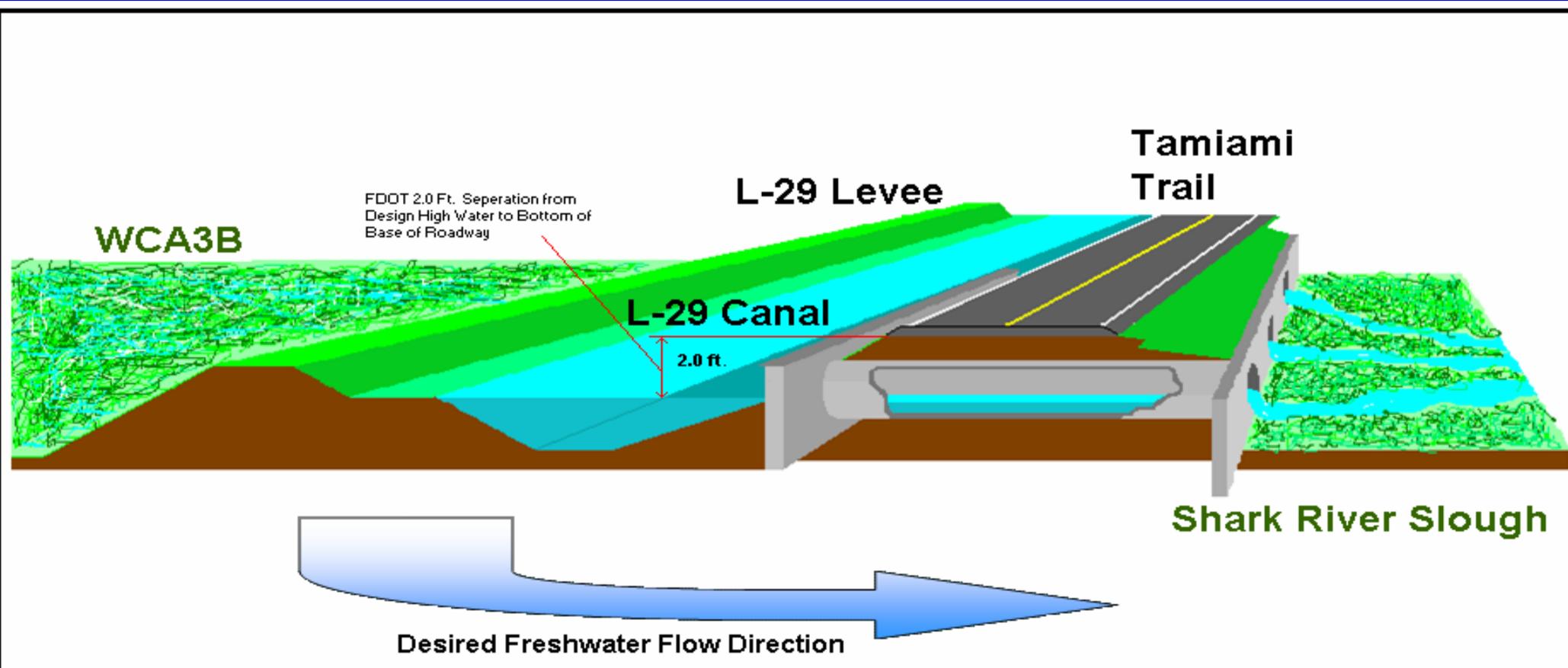
# FDOT Construction Cost Escalation



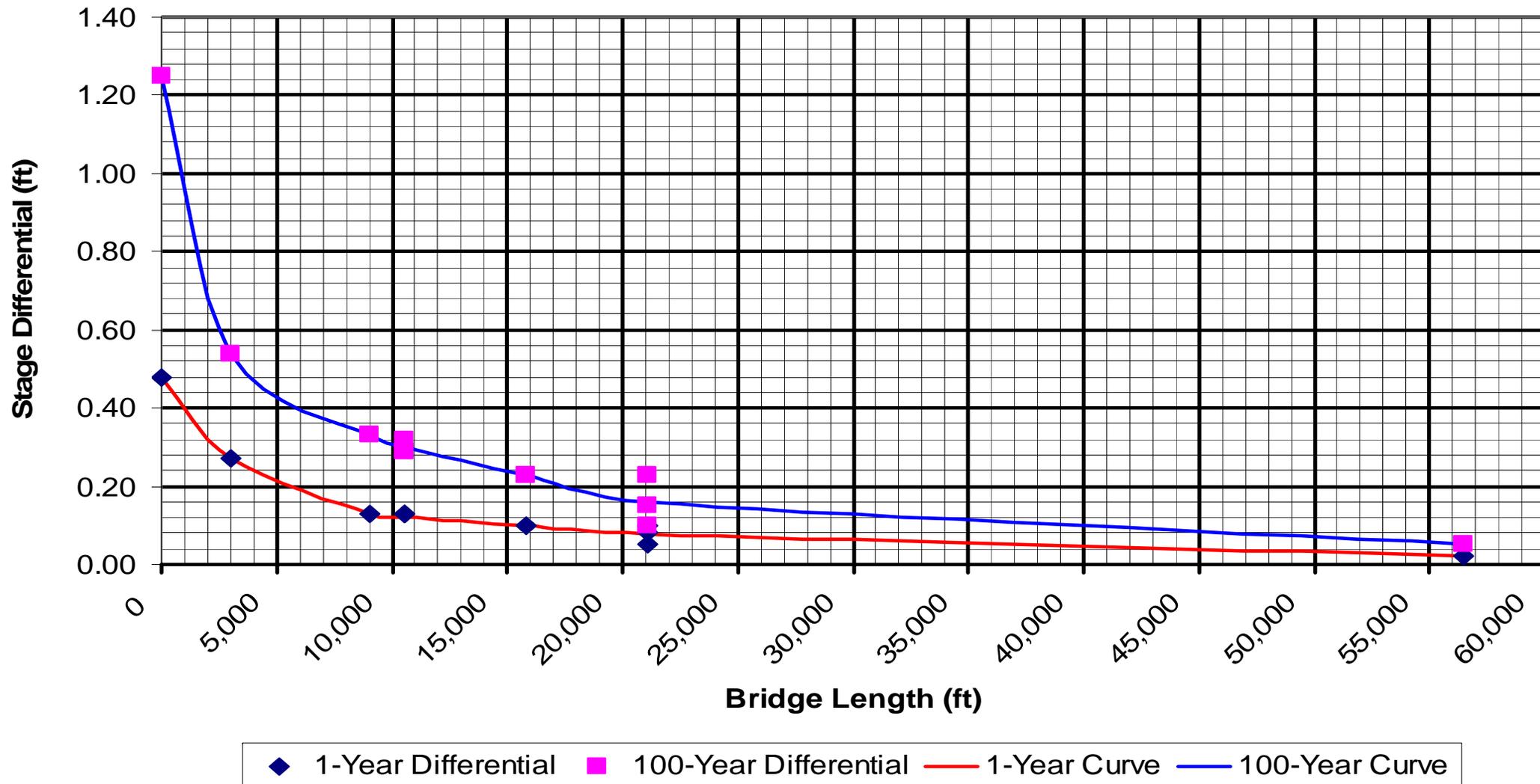
# Flows Through Tamiami Trail

- Currently 19 sets of culverts (55 culverts total) pass flow through Tamiami Trail
- Two key factors affect ability to move flows through Tamiami Trail
  - L-29 stage
  - Opening size
- L-29 stage is controlled by FDOT criteria to avoid impacts to the road
  - Current maximum allowable stage is 7.5 feet
- L-29 stage of 9.7 feet allows unconstrained flow through Tamiami Trail

# Cross-Section - Existing Conditions



# Stage Differential Across Trail for Various Bridge Lengths



# WRDA 2007

## Conference Report Language

- Directs Chief of Engineers to take steps upon completion of 8.5 SMA to increase flows to Park of at least 1400 cubic feet per second (cfs) without significantly increasing risk of roadbed failure
- Directs Chief of Engineers to re-examine prior reports and evaluate alternatives for increasing the flow of water under the highway and into the Park
  - Directs that flow to the Park have a minimum target of 4000 cfs
  - Take into account subsequent modifications to be done under CERP
  - Avoid modifications not compatible or duplicative with CERP
  - Submit recommendations to Congress by July 1, 2008
- Initiate evaluation of Tamiami Trail component of CERP as soon as practicable
  - Recommendations to include evaluation of modifying Tamiami Trail from Krome Avenue to boundary of BCNP

# Why 4000 cfs?

- 4000 cfs is based on structure maximum capacities from the 1992 GDM on the following structures discharging into L-29
  - S-333 @ 1350 cfs
  - S-355A @ 1000 cfs
  - S-355B @ 1000 cfs
  - S-356 @ 950 cfs
- Assumption: As all structures begin to reach their peak discharge capacity, S-333 would see tailwater impacts and reduce its capacity to 1050 cfs hence providing only 4000 cfs capacity

## Why 1400 cfs?

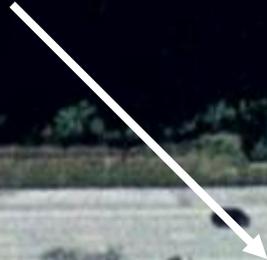
- S-333 in the L-29 Canal has been tested and was found capable of passing 1400 cfs
- 1400 cfs is a capacity that was achieved in the past during a flow test
- L-29 Borrow Canal stage stayed around Elevation 8.0 feet for the entire month of the test
- The test ended once gauging station G-3273 (in ENP) reached a stage above 6.8 feet

# **SPREADER SWALES PILOT PROJECT**

**Modified Water Deliveries to Everglades National Park**

# Tamiami Trail Current Conditions at Culverts

*Culverts*



FDOT

ENP

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Pointer 25°45'39.19" N 80°34'18.81" W elev 3 ft

Streaming ||||| 100%

Eye alt 647 ft



# Tamiami Trail

## Road Section at Culvert-Side view



Culvert set under  
Tamiami

ENP

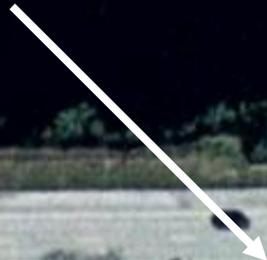
# Spreader Swales Pilot Project

- ENP has agreed to a pilot project at two locations along Tamiami Trail to test effectiveness of spreader swales
- Corps will prepare letter report and appropriate NEPA document in order to proceed with pilot project
- Implementation scheduled for FY 08 at estimated cost of \$2M
- Pilot project data will be used to determine the effectiveness of spreader swales in conveyance
- Construction of these swales will seek to meet the intent of the WRDA 2007 Conference report language for additional flows immediately once 8.5 SMA is complete

# Spreader Swales Pilot Testing



*Culverts*



FDOT

Spreader Swales- 30' x 1000' (at bottom)

ENP



O&M Swale will extend  
500' East & West of culvert  
set and 30' South

© 2006 Europa Technologies

Google

Pointer 25°45'39.19" N 80°34'18.81" W elev 3 ft

Streaming ||||| 100%

Eye alt 647 ft

# **ALTERNATIVES RE-ANALYSIS**

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**Modified Water Deliveries to Everglades National Park**

# Tamiami Trail Re-Analysis

A re-analysis of alternatives is being conducted to:

- Address the WRDA 2007 language
- Document the cost increases for the previously approved plan
- Develop cost saving options
- Re-analyze alternatives for completing Tamiami Trail

# Assumptions for Re-Analysis

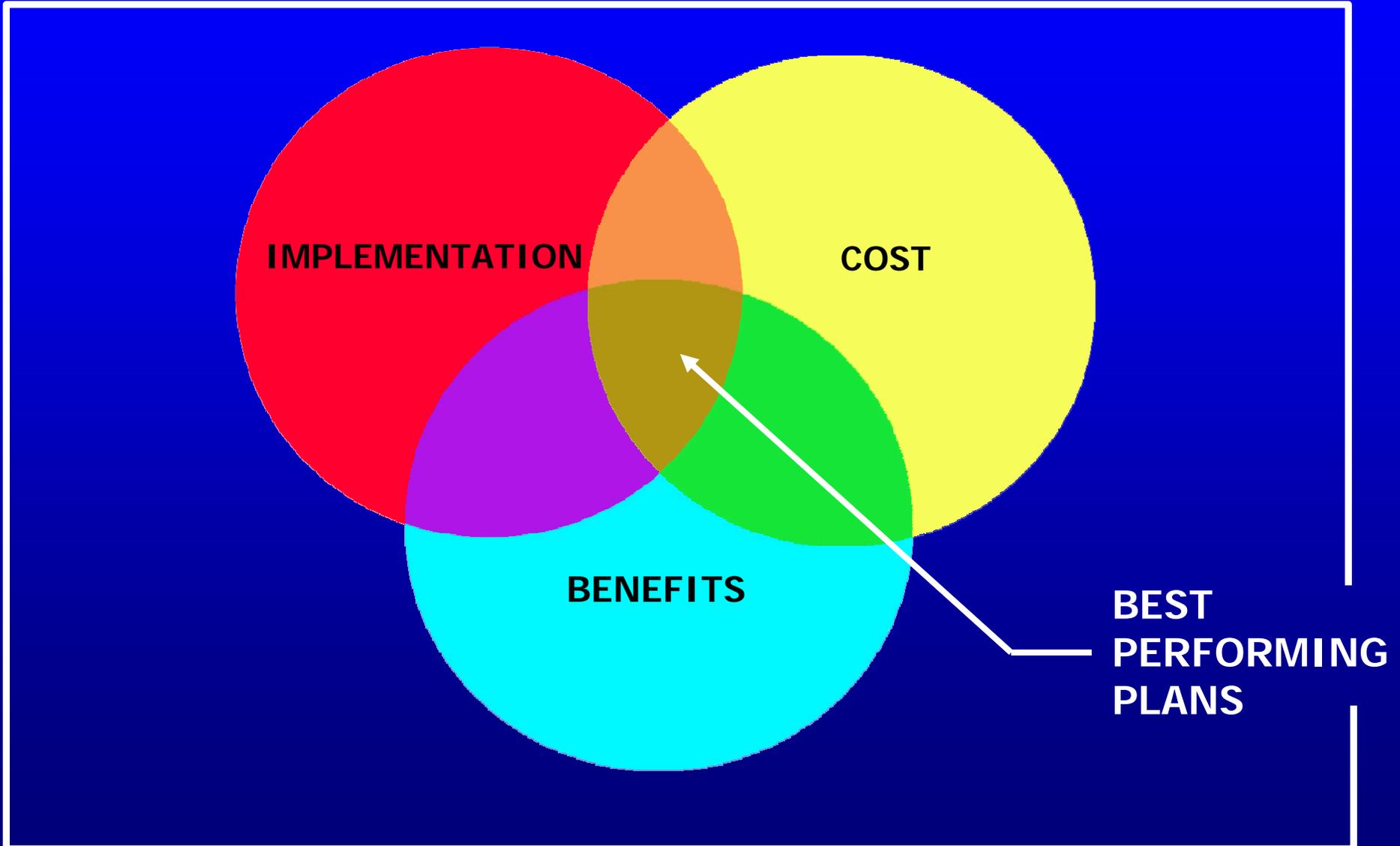
- Costs do not include acquisition of any lands required for Park expansion
- Cost estimates include appropriate escalation factors
- Road improvement costs based on 3.05 feet clearance requirement between road crest and L-29 stage
- Raising water levels above 7.5 feet requires modifications to the roadway to meet FDOT requirements

# Alternatives Considered

- 27 alternatives (including no-action) considered
- Organized into 5 groups:
  1. Constrain L-29 stage to 7.5 feet  
(No Roadway Improvement, No Stage Increase)
  2. Raise stage constraint to 8.0 feet  
(Minimum Roadway Improvement)
  3. Raise stage constraint to 8.5 feet  
(Moderate Roadway Improvement)
  4. Raise stage constraint to 9.7 feet  
(Major Roadway Modification)
  5. Other structural alternatives and roadway realignments

Each category includes a suite of structural combinations

# Determining the Best Performing Plans



# Analysis of the Matrix - Key Points

- Alternatives that can pass peak flow of 4,000 cfs through Tamiami Trail range from \$600M to \$1.6B
- Volume increases of 2% to 15% if L-29 maximum stage is limited to 7.5 feet
- Volume increases of 35% to 65% if L-29 maximum stage is raised to 8.0 feet
- Significant improvement in Ridge and Slough Processes with bridges
- Using current FDOT criteria, 70% of the road must be improved at a cost of \$134M to raise the L-29 maximum stage to 8.0 feet
- Using current FDOT criteria, 95% of the road must be improved at a cost of \$159M to raise the L-29 maximum stage to 8.5 feet
- Cost saving/value engineering results could be applied to reduce bridge and road costs

# Cost Saving/Value Engineering Proposals

- Use fill from existing stockpiles (SFWMD)
- Bridge foundation – shafts vs. piles (FDOT)
- Additional ROW – temporary and permanent (DOI)
- Use aggregate vs. asphalt for roadway surcharge (FDOT)
- Use design-build (USACE)

# Next Steps

- Select TSP
- Prepare draft decision document
- Public review of draft decision document
- Prepare final decision document
- Transmit report to Congressional Committees

# Tamiami Trail – Post Modified Water Deliveries Project

- Yellow Book recommended bridges/openings to convey flow across Tamiami Trail
- WRDA 2000 authorized raising/bridging eastern Tamiami Trail as part of the initially authorized Phase I Decomp project
- Raising/bridging Tamiami Trail to be evaluated as part of Decomp PIR 2 (eastern Trail) and Decomp PIR 3 (western Trail)
- Raising/bridging could also be considered as part of improvement or rebuilding of Tamiami Trail

**Questions?**

