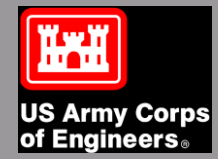
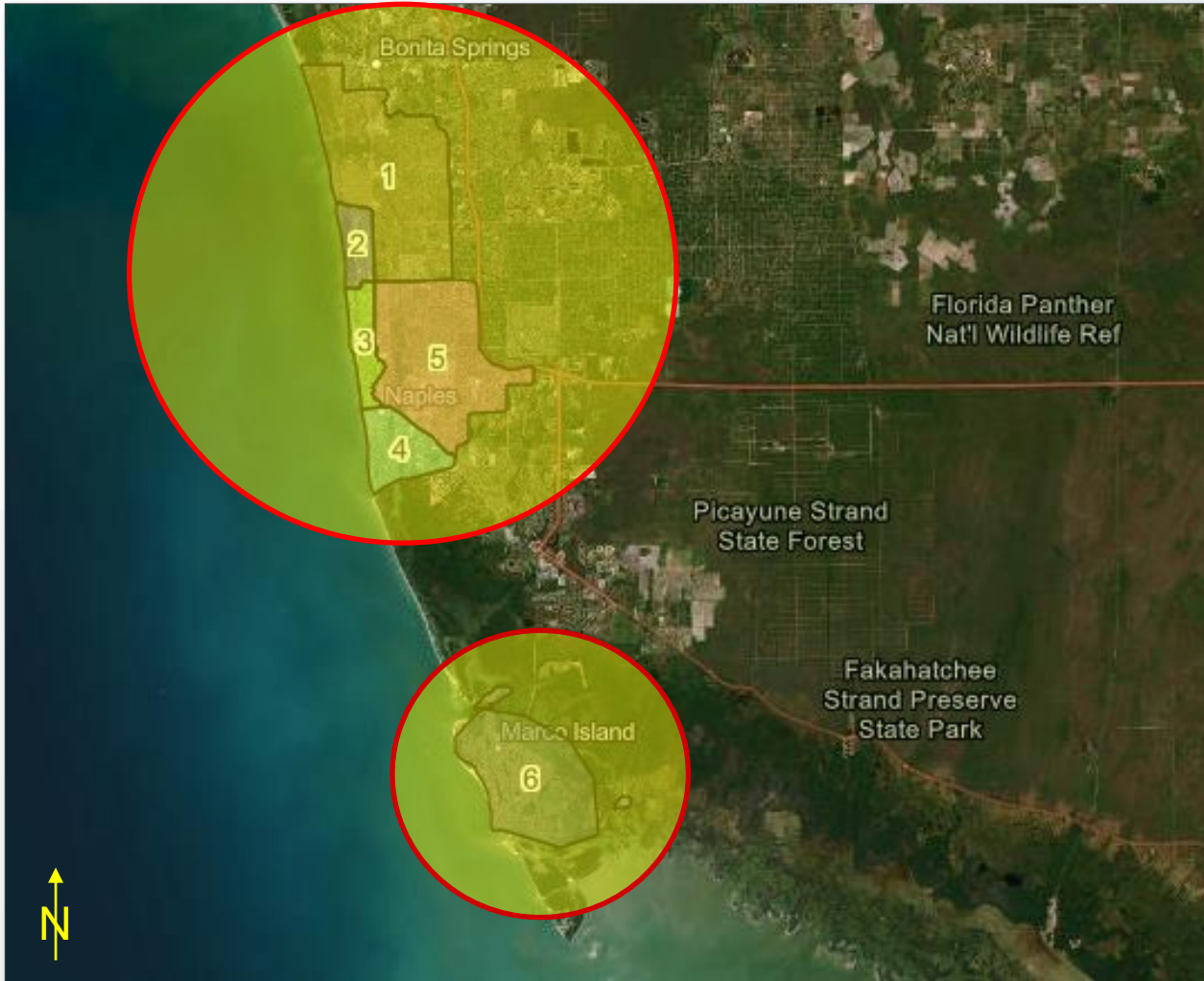




Collier County Coastal Storm Risk Management Feasibility Study  
CSRMA Ad Hoc Committee – 10/30/2024



# Coastal Storm Risk Management Feasibility Study: Planning Areas Update



USACE refined the Planning Areas based on results of the Planning Charettes conducted in April of 2023 and Public Information meetings that occurred in April and June of 2023

Revision of Planning Areas from a total of 6 to 4

Planning Areas will focus on beaches and Environmental Justice communities

Screening out of structural measures. Analysis to focus on beach nourishment, Critical Infrastructure, nonstructural measures, and possible Natural & Nature-Based Features (NNBF)

No analysis of measures within Coastal Barrier Resource Systems (CBRS)

# COLLIER CSR



## Geographic Scope – Planning Areas:

North County Beaches Planning Area

Marco Island Beach Planning Area

Naples Planning Area

Goodland Planning Area

Historically disadvantaged back bay communities that have elevated risks to livelihood and life safety during coastal storm events.

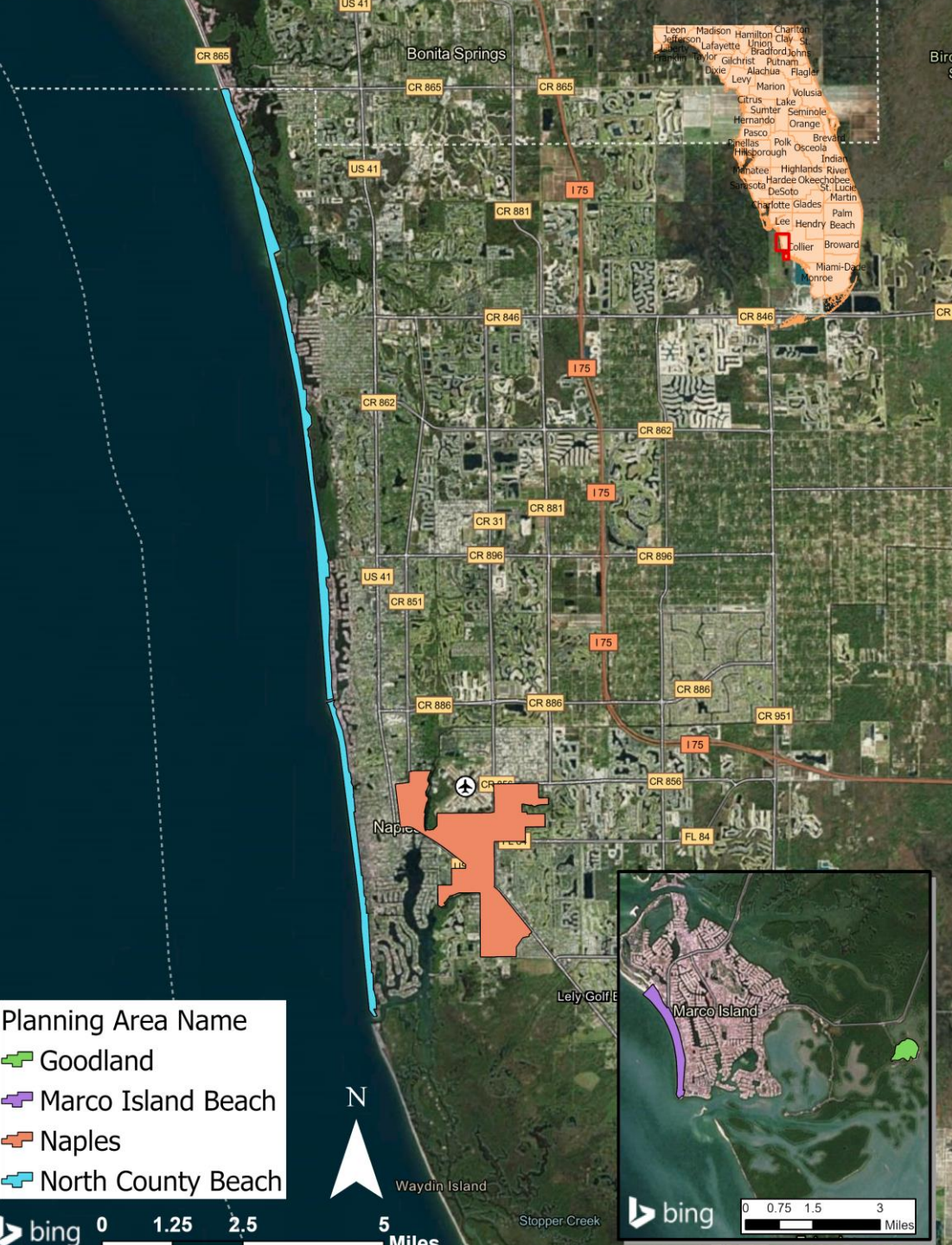
*Areas defined by EJ Screen Tool*

## Upcoming Analysis Scope:

Beach nourishment, nonstructural measures, Critical Infrastructure, and Nature-Based Solutions.

Nature-Based Solutions being considered: vegetated dune (as component of beach nourishment) and mangrove restoration at Clam Pass

*This study is **not** a one-time, fix-all solution to coastal storm risk. There will **always** be coastal storm risk in Collier County.*



# Coastal Storm Risk Management Feasibility Study: Array of Alternatives

## Measures carried forward for additional analysis

- 1 Floodproofing (commercial buildings)
- 2 Critical Infrastructure
- 3 Elevations (residential homes)
- 4 Beach berm/vegetated dune nourishment
- 5 Mangroves Restoration/NNBFs
- 6 Recommend state and local governments update building code ordinances

## Measures screened out and no longer considered *in this study*.

- 8 Inland Floodwalls at US-41 and 111 Ave N.
- 9 Levee East of Clam Pass Park
- 10 Doctors Pass Storm Surge Barrier
- 11 Tamiami Trail Floodwall
- 12 (2) Floodgates at Caxambas Pass and (1) at Collier Creek
- 13 Breakwater south of Caxambas Pass
- 14 Acquisitions and Relocations
- 15 Oyster Reefs



US Army Corps  
of Engineers®

# NATURE-BASED SOLUTIONS



## What is a Nature-Based Solution?

Measures that work with or restore natural processes with the aim of wave attenuation and storm surge reduction. **Natural features** are those created through physical, geological, and chemical processes over time. **Nature-based solutions** are created by human design, engineering, and construction to work in concert with natural processes to mimic, as closely as possible, conditions that would occur in the absence of human influence to the environment to manage coastal storm risk.



Nature-Based Solutions being considered in this study:

- Nourishment of beaches with a vegetated dune
- Mangrove restoration in Clam Pass (shown in bottom left picture)





U.S. ARMY



US Army Corps  
of Engineers®

# ENVIRONMENTAL COMPLIANCE: ENVIRONMENTAL JUSTICE



## *What is “Environmental Justice” and the “Justice40 Initiative”?*

**Environmental Justice** is “The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income regarding the development, implementation, and enforcement of environmental laws, regulations, and policies, with no group bearing a disproportionate burden of environmental harms and risks.” (ASA(CW) Memorandum 15 March 2022)

**Justice40** is “A whole-of-government initiative that 40% of the overall benefits flow to marginalized, disadvantaged, and overburdened by pollution.” (Section 233 of EO 14008)

**We strive to scope our studies so that they are inclusive of all communities at risk.**

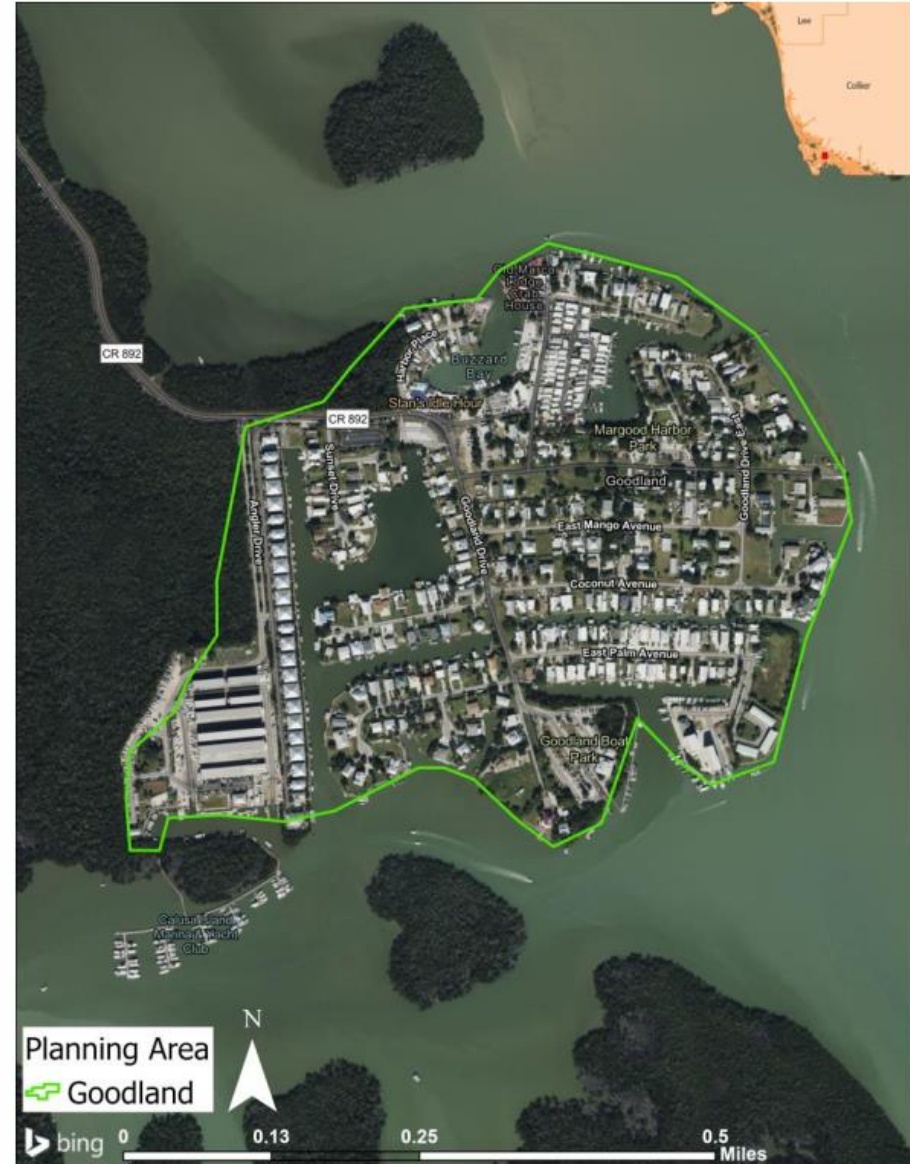
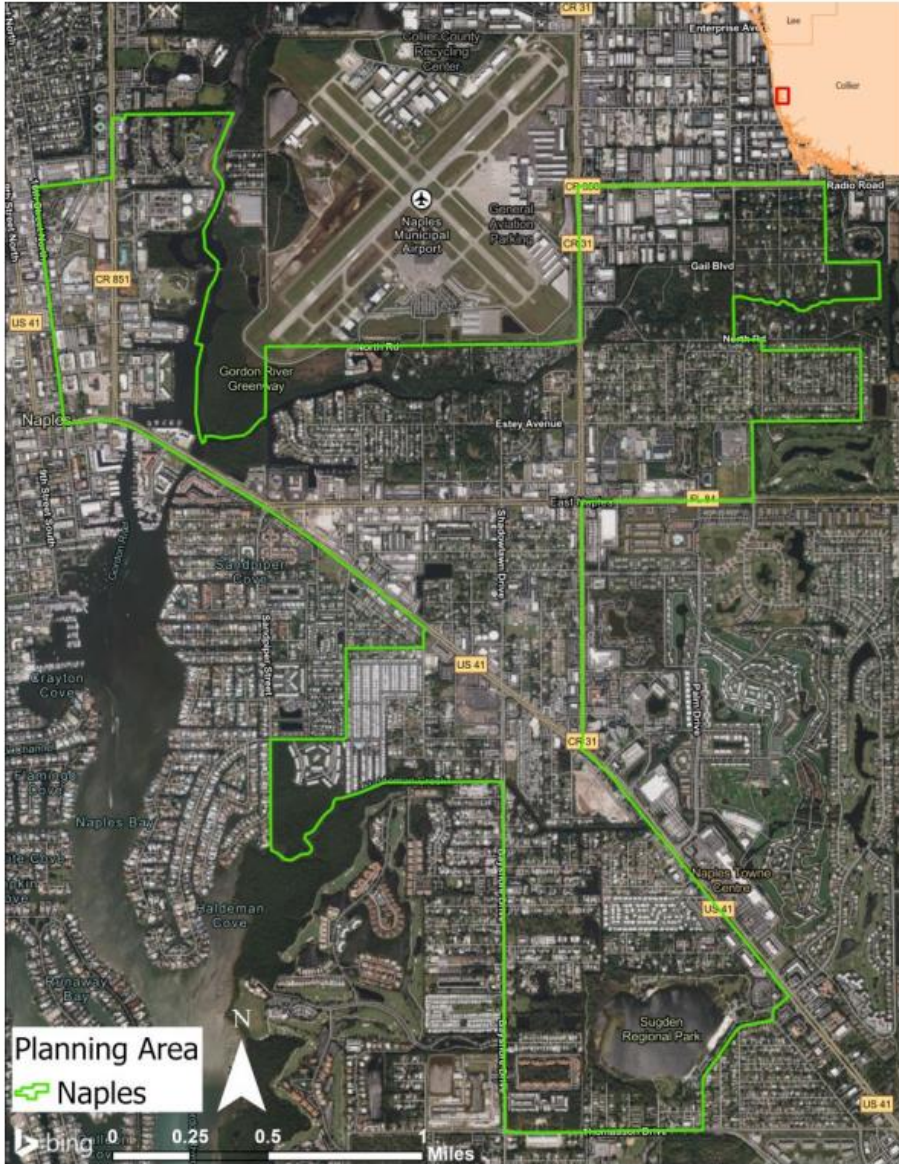


U.S. ARMY



US Army Corps of Engineers

# AREAS BEING CONSIDERED FOR HOME ELEVATIONS (IN THIS STUDY)





U.S. ARMY



US Army Corps  
of Engineers®

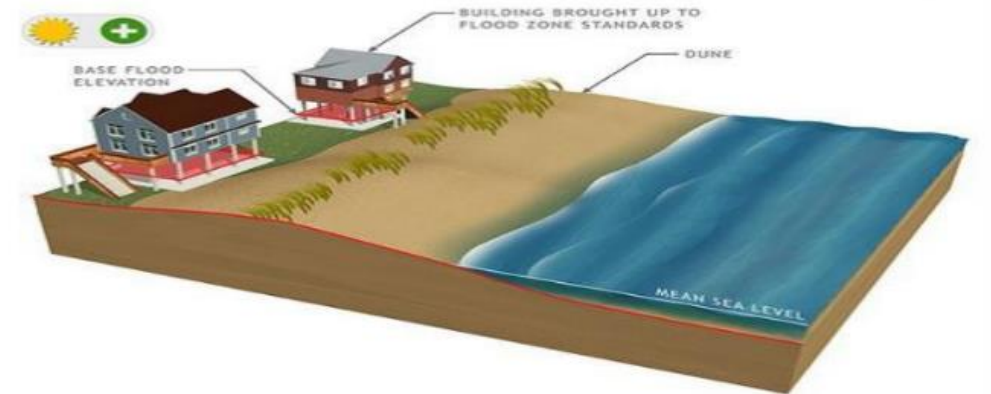
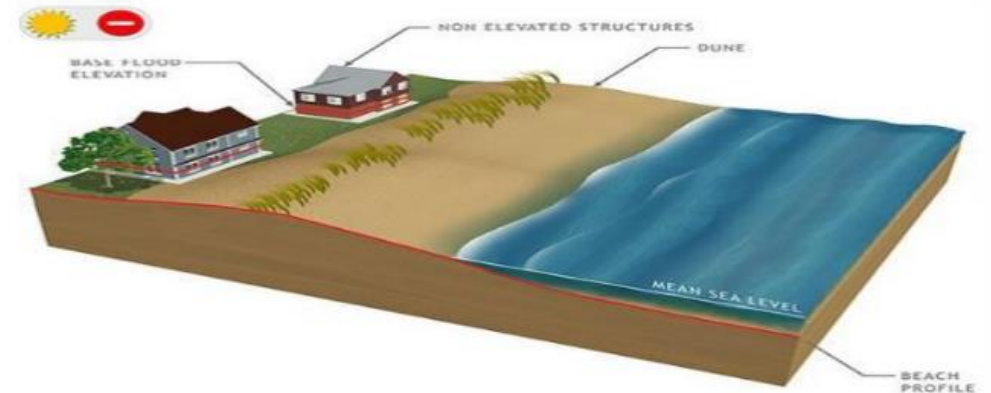
# NONSTRUCTURAL MEASURES



**Nonstructural measures** are measures that reduce the **probability** of a building being damaged by **flooding in a large coastal storm event**, but do not reduce the extent of the flooding itself.

Nonstructural measures being considered in this study:

- Elevating individual homes
- Dry and wet floodproofing of commercial buildings and Critical Infrastructure







# NEXT STATUS MEETING & ADDITIONAL INFO

- ❖ Email to contact the USACE team:  
[Collier-CSRМ@usace.army.mil](mailto:Collier-CSRМ@usace.army.mil)
- ❖ Visit the story map using the QR code or the following link:  
<https://colliercountyfl.webex.com/colliercountyfl/j.php?MTID=ma30d7a38d56e302ce2111614f7d75e9a>
- ❖ Next monthly status meeting is on Wednesday, November 25th at 3:30 PM

2024 - 2025 Monthly Public Status Meetings
Wednesday, October 23
Wednesday, November 27
Wednesday, December 25
Wednesday, January 22
Wednesday, February 26

## Collier CSRМ Re-initiated Feasibility Study Quick Facts

**Collier County**  
*Nonfederal Sponsor*

**3 years**  
*Study Schedule*

**\$2.97 Million**  
*Study Budget, 100% Federal*

~~**February 2025**~~  
*Anticipated Draft Report Public Release*

~~**May 2026**~~  
*Anticipated Signed Chief's Report*

Visit the  
USACE website  
or the Collier  
CSRМ story  
map for more  
information





U.S. ARMY



US Army Corps  
of Engineers®

# TENTATIVELY SELECTED PLAN

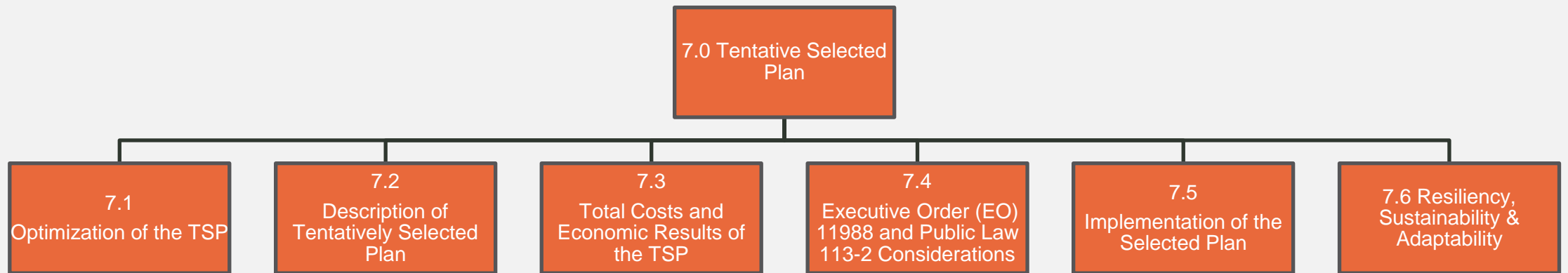


A TSP is a key milestone in the environmental planning and decision-making process for large-scale projects, particularly those involving transportation infrastructure or land development. It represents the preferred alternative among the options considered during the planning and environmental analysis phase. When a project undergoes environmental assessment, various alternatives are typically evaluated to determine their potential impacts on the environment, social factors, and economic considerations. These alternatives could include different routes for a highway, locations for a new facility, or designs for a development project.

After considering the environmental impacts, public input, and other factors, the agency or entity responsible for the project selects a preferred alternative, which is then documented in the Tentatively Selected Plan. This plan outlines the chosen option and provides justification for why it was selected over the other alternatives. The Tentatively Selected Plan is subject to further review and public comment before it becomes finalized. Feedback received during this period may result in adjustments to the plan or the inclusion of additional mitigation measures to address concerns raised by stakeholders. Once all necessary approvals and permits are obtained and any required environmental impact statements are completed, the TSP may be formally adopted as the final plan for the project, paving the way for its implementation.

# TENTATIVE SELECTED PLAN (TSP)

The TSP is the outcome of the analyses which occurred to evaluate a variety of competing measures and alternative plans to reduce the risk associated with future coastal storms in Collier County.



# 1.0 OPTIMIZATION OF THE TSP

The USACE **SMART**\* planning process emphasizes study teams should use a reasonable level of details to collect data and model alternatives and to analyze and evaluate effectiveness in order to identify the TSP. The PDT has completed the evaluation and comparison of the final array of distinctly different alternatives for achieving the water resources objectives in the study area, and they have identified a TSP to carry forward.

\* **S**pecific-**M**easurable-**A**chievable-**R**elevant-**T**ime bound

## 2.0 DESCRIPTION OF TENTATIVELY SELECTED PLAN

The TSP is the National Economic Development (NED) plan and will include the best alternative from the final array of alternatives. The TSP is the outcome of the analyses which occurred to evaluate a variety of competing measures and alternative plans.



# 3.0 TOTAL COSTS AND ECONOMIC RESULTS OF THE TSP

In this section the plan will include the total cost and the explanation of the basis for this amount, including the Benefit-Cost Ratio (BCR)

Table 7-1. Total Project First Costs of the TSP

<b>Federal discount rate FY20 = 2.75%, 2020 Price Levels, 50-Year Period of Analysis, Figures in \$ Except BCR</b>	
<i>Project First Costs</i>	
Construction <sup>1</sup>	1,087,482,000
Preconstruction Engineering & Design (PED)	154,152,000
Construction Management (CM)	130,030,000
Real Estate	113,305,000
Environmental Mitigation	212,973,000
Cultural Resource Mitigation	5,914,000
Contingency	539,973,000
<b>Total Project First Costs</b>	<b>2,243,829,000</b>
<i>Average Annual Costs</i>	
Construction <sup>2</sup>	101,478,000
Interest During Construction	1,694,000
Annual OMRR&R	1,000,000
<b>Total Average Annual Cost</b>	<b>104,171,000</b>
Average Annual Benefits	375,923,000
Net Benefits	271,752,000
<b>Benefit-Cost Ratio (BCR)</b>	<b>3.6</b>

# 3.0 TOTAL COSTS AND ECONOMIC RESULTS OF THE TSP

Table 7-2. Economic Analysis Results for Each Measure of the TSP (figures in \$1,000)

	Planning Area 1			Planning Area 2	Planning Area 3			Planning Area 5	Planning Area 6
	Wiggins Pass Surge Barrier	Bonita Beach Road Alignment	Beach Nourishment	Nonstructural	Seagate Drive Alignment	Doctor's Pass Surge Barrier	Beach Nourishment	Tamiami Trail	Nonstructural
Project First Cost	355,763,000	103,338,000	154,972,000	133,938,000	53,977,000	60,839,000	160,035,000	389,964,000	831,573,000
Annualized Investment Cost	13,726,000	3,987,000	16,174,000	4,972,000	2,191,000	4,455,000	14,142,000	14,643,000	30,872,000
Plus: Annualized OMRR&R	240,000	178,000	-	-	20,000	92,000	-	370,000	-
Project Average Annual Cost	13,966,000	4,165,000	16,174,000	4,972,000	2,211,000	2,547,000	14,142,000	15,013,000	30,872,000
Average Annual Cost	18,131,000	16,174,000	16,174,000	4,972,000	4,866,000	14,142,000	15,013,000	30,872,000	30,872,000
Average Annual Benefits	18,449,000	2,688,000	12,583,000	12,583,000	11,401,000	4,715,000	240,102,000	86,006,000	86,006,000
Net Benefits	318,000	-13,555,000	-3,591,000	7,611,000	6,535,000	-9,427,000	225,089,000	55,134,000	55,134,000
<b>B/C Ratio</b>	<b>1.0</b>	<b>0.2</b>	<b>0.2</b>	<b>2.5</b>	<b>2.3</b>	<b>0.3</b>	<b>16.0</b>	<b>2.8</b>	<b>2.8</b>
<b>Planning Area</b>									
Average Annual Cost	3,305,000			4,972,000	19,008,000			15,013,000	30,872,000
Average Annual Benefits	21,117,000			12,583,000	16,116,000			240,102,000	86,006,000
Net Benefits	-13,188,000			7,611,000	-2,892,000			225,089,000	55,134,000
<b>B/C Ratio</b>	<b>0.6</b>			<b>2.5</b>	<b>0.8</b>			<b>16.0</b>	<b>2.8</b>

Notes:

- (1) Prices are at FY20 price levels, estimates were annualized using a discount rate of 2.75%
- (2) First costs for structural projects include 30% contingency, Planning, Engineering, and Design (PED), Real Estate, Environmental and Cultural Resource Mitigation
- (3) Present value first cost for beach nourishments do not include periodic renourishment every 7 years
- (4) Annualized investment cost for beach nourishments do include periodic renourishment every 7 years
- (5) OMRR&R – Operations, maintenance, repair, replacement and rehabilitation

# 4.0 EXECUTIVE ORDER (EO) 11988 AND PUBLIC LAW 113-2

Executive Order 11988 requires federal agencies avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities".

The Water Resources Council Floodplain Management Guidelines for implementation of EO 11988, as referenced in USACE ER 1165-2-26, requires an eight-step process that agencies should carry out as part of their decision making on projects that have potential impacts to, or are within the floodplain.



US Army Corps  
of Engineers®

## Executive Order 11988

### Flood Plain Management Decision Making Process

#### Description and Intent

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities" for the following actions:

- acquiring, managing, and disposing of federal lands and facilities;
- providing federally-undertaken, financed, or assisted construction and improvements;
- federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

#### Summary of the 8-Step Decision Making Process

The guidelines address an eight-step process that agencies should carry out as part of their decision-making on projects that have potential impacts to or within the floodplain. The eight steps, which are summarized below, reflect the decision-making process required in Section 2(a) of the Executive Order.

1. Determine if a proposed action is in the base floodplain (area with a one percent or greater chance of flooding in any given year).
2. Conduct early public review, including public notice.
3. Identify and evaluate practicable alternatives to locating in the base floodplain, including alternative sites outside of the floodplain.
4. Identify impacts of the proposed action.
5. Minimize threats to life and property and to natural and beneficial floodplain values. Restore and preserve natural and beneficial floodplain values.
6. Reevaluate alternatives.
7. Issue findings and a public explanation.
8. Implement the action.

#### Summary of EO 11988 Evaluation Process

Evaluation of a federal activity by a District office should consider the potential for loss of life, the possibility of repeatable flood damages, and the affect of suspending operation of a critical facility during a flood event. General procedures for evaluating federal activities are as follows:

1. Identify the location of the proposed federal activity on an effective Flood Insurance Rate Map (FIRM).
  - a. If FIRM does not exist, consider conducting "Approximate Zone A" evaluation.
2. Note whether the activity location lies within a FEMA designated floodway.
  - a. If in floodway, reevaluate alternative
3. Determine if the federal activity involves a critical facility.
  - a. If critical facility, proceed to step 4
  - b. If not a critical facility, proceed to step 6
4. If possible, identify new location for critical facility outside of 0.2% annual chance floodplain.
5. If critical facility required to be located within the 1% annual chance floodplain.
  - a. Ensure first floor elevated at or above 0.2% annual chance flood elevation, or
  - b. Ensure facility may be protected by barrier, floodwall, or levee at or above 0.2% annual chance flood elevation.
6. If possible, identify new location for federal activity outside of 1.0% annual chance floodplain.
7. If federal activity is required to be located within the 1% annual chance floodplain, ensure first floor elevation and all utilities are located above the 1.0% annual chance flood elevation.
8. Issue findings.

## **5.0 IMPLEMENTATION OF THE SELECTED PLAN**

Implementation will depend on the final array of alternatives.

## **6.0 RESILIENCY, SUSTAINABILITY AND ADAPTABILITY**

This intent of this section is to address how the TSP contributes to the resiliency, how it affects sustainability, and how it may be adapted to continue to perform under changed future conditions in Collier County.

USACE describes resilience as “the ability to anticipate, prepare for, respond to, and adapt to changing conditions and to withstand and recover rapidly from disruptions with minimal damage”.





# Thank You

Christopher Mason  
Christopher.Mason@CollierCountyFL.gov

