# CITY OF SELMA, ALABAMA
# FLOOD RISK MANAGEMENT FEASIBILITY STUDY

## VIRTUAL PUBLIC MEETING

## US Army Corps of Engineers
## Mobile District

**OCTOBER 7, 2020**

*"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*

US Army Corps of Engineers

U.S.ARMY

The City of Selma ALABAMA Civil War to Civil Rights and Beyond

# SELMA FRM STUDY AUTHORITY

- *House Document No. 66, Seventy-fourth Congress, first, session, with a view to determined the advisability of providing improvements for flood control on the Alabama River in Dallas County, Alabama.*

  - *America's Water Infrastructure Act of 2018 Title I - Water Resources Development Subtitle B - Studies and Reports SEC. 1203. EXPEDITED COMPLETION.*

    *(a) Feasibility Reports. -- The Secretary shall expedite the completion of a feasibility study… and if the Secretary determines that the project is justified in a completed report, may proceed directly to preconstruction planning, engineering, and design of the project:*

    *(1) Project for riverbank stabilization, Selma, Alabama.*

# SELMA FRM STUDY OVERVIEW

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## STUDY OBJECTIVE

**USACE is conducting a comprehensive engineering, economic and environmental study to determine the costs, benefits and environmental impacts of various alternatives and select a plan to manage the hazards associated with flooding and reduce the negative consequences of flooding to people and property in Selma, Alabama.**

## STUDY SPONSOR AND DURATION

*Non-Federal Sponsor: City of Selma, AL* → *Study Duration: 3 Years*

# DECISION MILESTONES


**ALTERNATIVES MILESTONE**

Vertical Team concurrence on Array of Alternatives

**1/16/19**

**TENTATIVELY SELECTED PLAN (TSP) MILESTONE**

Vertical Team concurrence on TSP

**7/22/20**

**AGENCY DECISION MILESTONE**

Agency Endorses Recommended Plan

**12/11/20**

**FINAL REPORT SUBMITTAL**

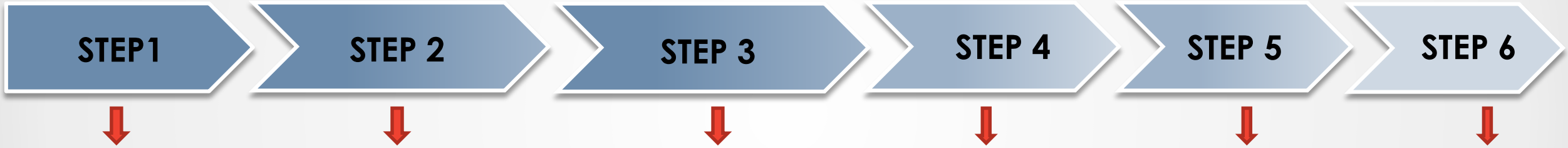
Release for State & agency Review

**4/09/21**

**CHIEF'S REPORT**

**10/07/21**

# SIX STEP PLANNING PROCESS




**STEP 1** — IDENTIFY PROBLEMS, OPPORTUNITIES, OBJECTIVES, & CONSTRAINTS

**STEP 2** — INVENTORY & FORECAST CONDITIONS

**STEP 3** — FORMULATE ALTERNATIVE PLANS

**STEP 4** — EVALUATE ALTERNATIVES

**STEP 5** — COMPARE ALTERNATIVES

**STEP 6** — IDENTIFY TENTATIVELY SELECTED PLAN

# PLANNING ANALYSIS

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## PROBLEMS

- Damages due to **Flooding** in Wards 1, 3, 6 and 8
- **Riverbank erosion** along Alabama River.
- **Structural Foundation Impacts** to historic buildings
- Impacts to **Community Cohesiveness** due to flood damages to property
- **Lack of Access** to the Alabama River

## OPPORTUNITIES

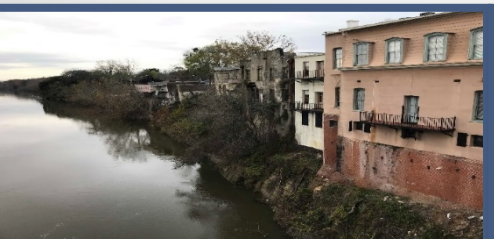
- **Stabilize river bank** along the Alabama River
- **Reduce flood related damages** to properties
- **Improve recreational opportunities** and **increase access** to the Alabama River
- **Reduce threats** to historic buildings and cultural resources

## OBJECTIVES

- **Reduce average annual flood damages** to residential and commercial property
- **Reduce Alabama River bank damages** between river miles 256-261, due to erosion and bank failure
- **Stabilize and preserve** the historic integrity of structures surrounding the Edmund Pettus Bridge

## CONSTRAINTS

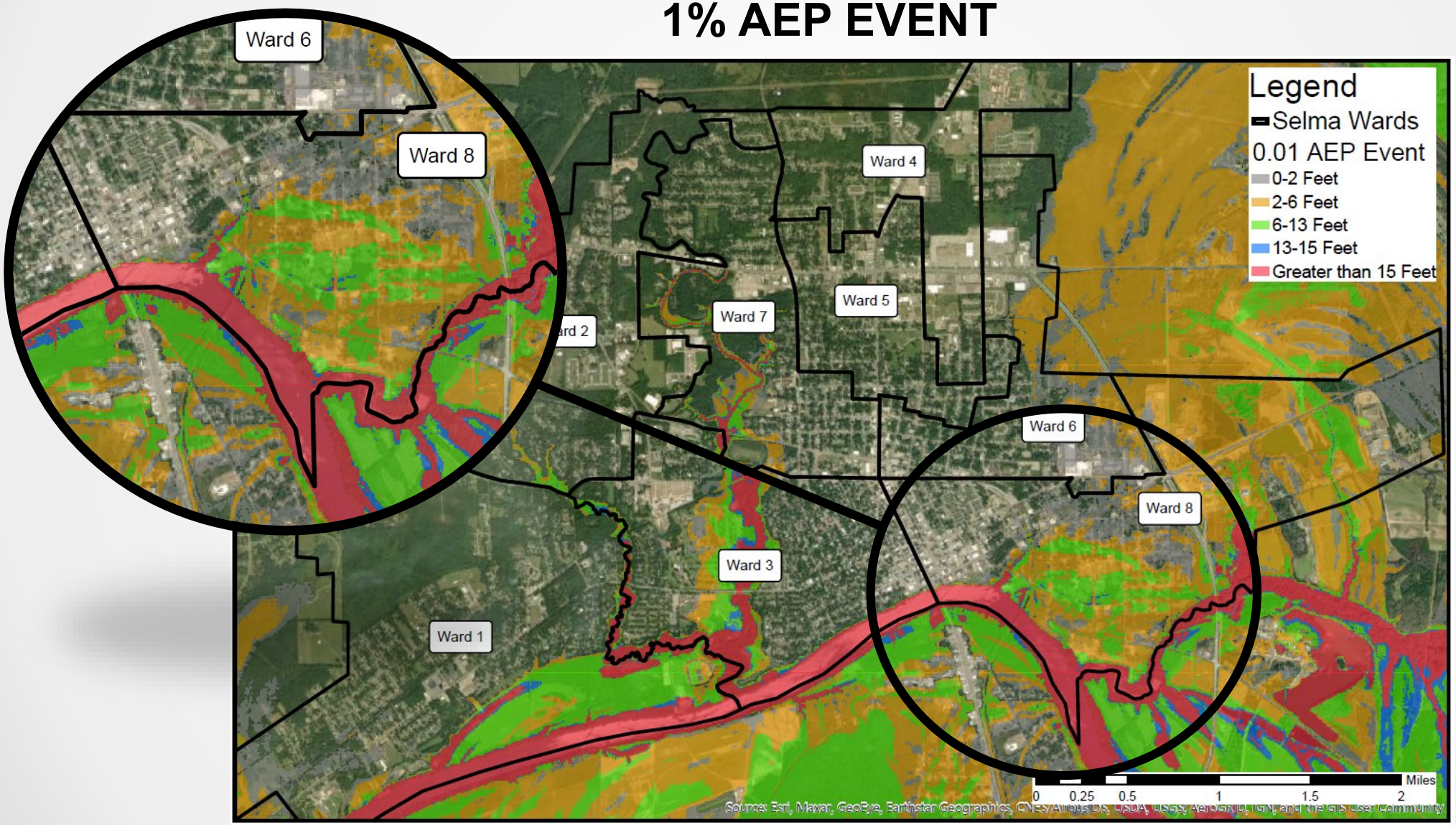
- **Minimize impacts** to existing T&E Species and Critical Habitats (such as Heavy Pigtoe, **Tulotoma Snails**, Alabama Sturgeon)
- Minimize impacts to **existing Federal projects** (CAP Section 14 project)
- Minimize impacts to **cultural resources** (such as **Edmund Pettus Bridge**, Historic districts and Civil War sites)
- Minimize relocation of tenants due to limited availability of **Decent Safe Sanitary (DSS) housing**





# PROBLEMS – RIVERINE FLOODING

## 1% AEP EVENT



# PROBLEMS – RIVERBANK EROSION

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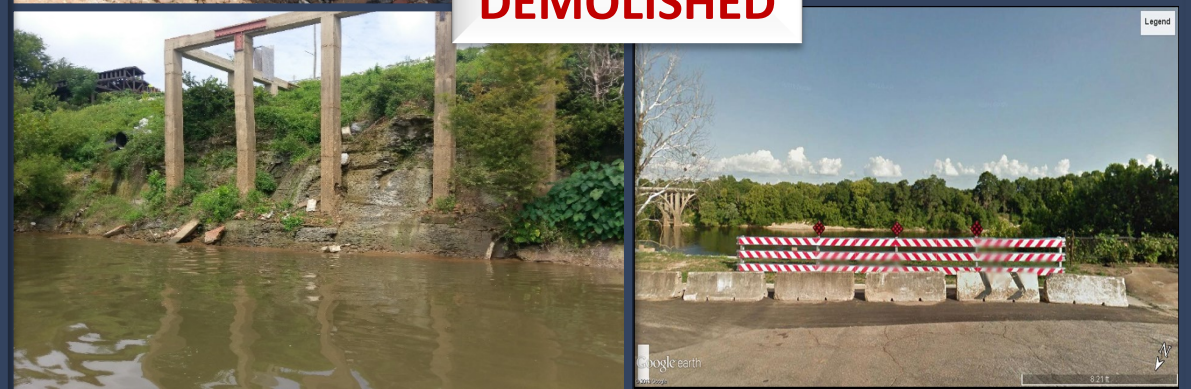
## Building Assessment

- Most buildings within 10 feet of top edge of bank (where bank drops abruptly)
- Majority of structures appear to be in extremely poor condition
- Relocating structures may not be feasible due to building condition and extremely expensive to relocate street and other buildings/utilities
- Cultural value would be lost



DEMOLISHED



## Riverbank Erosion Consequences

- Building **foundations become weak** and unstable beyond repair
- **Structural instability** to surrounding roadways and utilities
- **Potential life and safety concerns** due to structural/infrastructure integrity
- **Loss of NR cultural resources** and historic integrity
- **Economic impacts** to tourism industry

# FOCUSED ALTERNATIVES

## Non-Structural Alternatives

- **Alt. 1.a:** Buyouts

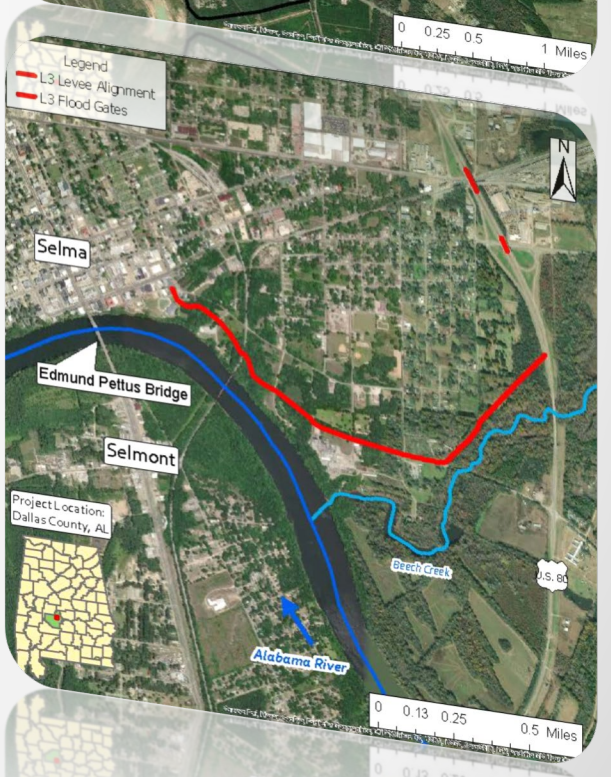
## Structural Alternatives

- **Alt. 2:** 1967 Levee - Pump Stations/Culverts/Weirs/Sluice Gates
- **Alt. 3:** Optimized (Short) Levee
- **Alt 4:** Bankline Stabilization + Floodplain Management/Emergency Evac. Plan

## Combined Alternatives

- **Alt. 5:** Bankline Stabilization + Buyout
- **Alt. 6:** Optimized Selma Levee + Buyouts + Soldier Pile Wall





# ALTERNATIVE EVALUATION & COMPARISON

## Qualitative and Quantitative Analysis

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### NED

- Reduce Flood Impacts
- Required Exception to Policy

### RED

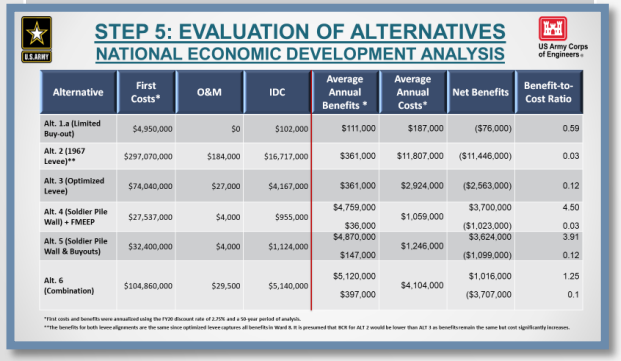
- Enhance Regional Development
- Allows for Community Resiliency

### EQ

- Environmentally Sustainable
- Preserves Historic Viewshed

### OSE

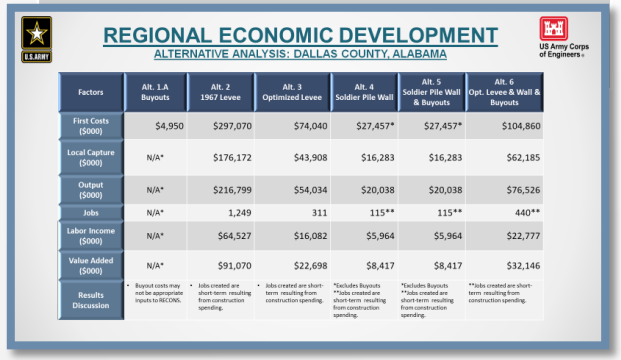
- Community Cohesion
- Environmental Justice
- Reduces Damages to Historic Structures
- Increase Life & Safety



STEP 5: EVALUATION OF ALTERNATIVES
NATIONAL ECONOMIC DEVELOPMENT ANALYSIS

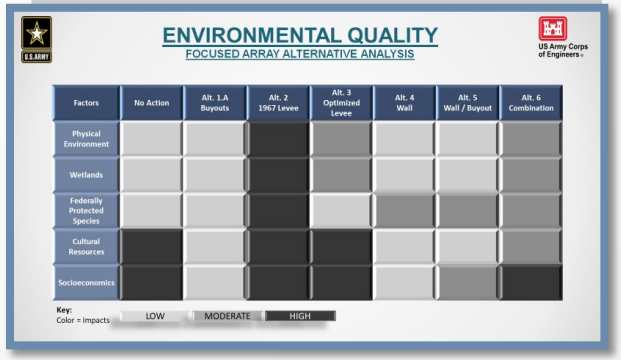
| Alternative | First Costs* | O&M | IDC | Average Annual Benefits * | Average Annual Costs* | Net Benefits | Benefit-to-Cost Ratio |
|---|---|---|---|---|---|---|---|
| Alt. 1.a (Limited Buy-out) | $4,950,000 | $0 | $102,000 | $111,000 | $187,000 | ($76,000) | 0.59 |
| Alt. 2 (1967 Levee)** | $297,070,000 | $184,000 | $16,717,000 | $361,000 | $11,807,000 | ($11,446,000) | 0.03 |
| Alt. 3 (Optimized Levee) | $74,040,000 | $27,000 | $4,167,000 | $361,000 | $2,924,000 | ($2,563,000) | 0.12 |
| Alt. 4 (Soldier Pile Wall) + FMEEP | $27,537,000 | $4,000 | $955,000 | $4,759,000<br>$36,000 | $1,059,000 | $3,700,000<br>($1,023,000) | 4.50<br>0.03 |
| Alt. 5 (Soldier Pile Wall & Buyouts) | $32,400,000 | $4,000 | $1,124,000 | $4,870,000<br>$147,000 | $1,246,000 | $3,624,000<br>($1,099,000) | 3.91<br>0.12 |
| Alt. 6 (Combination) | $104,860,000 | $29,500 | $5,140,000 | $5,120,000<br>$397,000 | $4,104,000 | $1,016,000<br>($3,707,000 | 1.25<br>0.1 |

*First costs and benefits were annualized using the FY20 discount rate of 2.75% and a 50-year period of analysis.
**The benefits for both levee alignments are the same since optimized levee captures all benefits in Ward B. It is presumed that BCR for ALT 2 would be lower than ALT 3 as benefits remain the same but cost significantly increases.



REGIONAL ECONOMIC DEVELOPMENT
ALTERNATIVE ANALYSIS: DALLAS COUNTY, ALABAMA

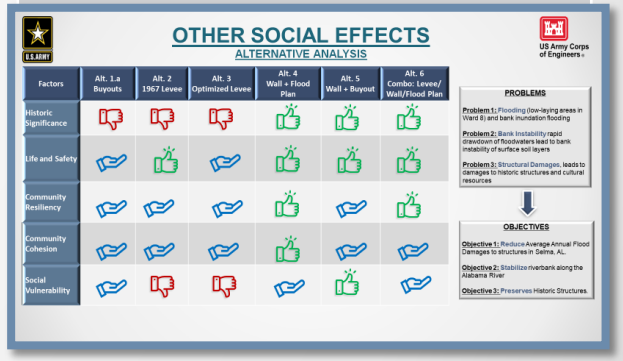
| Factors | Alt. 1.A Buyouts | Alt. 2 1967 Levee | Alt. 3 Optimized Levee | Alt. 4 Soldier Pile Wall | Alt. 5 Soldier Pile Wall & Buyouts | Alt. 6 Opt. Levee & Wall & Buyouts |
|---|---|---|---|---|---|---|
| First Costs ($000) | $4,950 | $297,070 | $74,040 | $27,457* | $27,457* | $104,860 |
| Local Capture ($000) | N/A* | $176,172 | $43,908 | $16,283 | $16,283 | $62,185 |
| Output ($000) | N/A* | $216,799 | $54,034 | $20,038 | $20,038 | $76,526 |
| Jobs | N/A* | 1,249 | 311 | 115** | 115** | 440** |
| Labor Income ($000) | N/A* | $64,527 | $16,082 | $5,964 | $5,964 | $22,777 |
| Value Added ($000) | N/A* | $91,070 | $22,698 | $8,417 | $8,417 | $32,146 |
| Results Discussion | • Buyout costs may not be appropriate inputs to RECONS. | • Jobs created are short-term resulting from construction spending. | • Jobs created are short-term resulting from construction spending. | *Excludes Buyouts **Jobs created are short-term resulting from construction spending. | *Excludes Buyouts **Jobs created are short-term resulting from construction spending. | **Jobs created are short-term resulting from construction spending. |



ENVIRONMENTAL QUALITY
FOCUSED ARRAY ALTERNATIVE ANALYSIS

| Factors | No Action | Alt. 1.A Buyouts | Alt. 2 1967 Levee | Alt. 3 Optimized Levee | Alt. 4 Wall | Alt. 5 Wall / Buyout | Alt. 6 Combination |
|---|---|---|---|---|---|---|---|
| Physical Environment | | | | | | | |
| Wetlands | | | | | | | |
| Federally Protected Species | | | | | | | |
| Cultural Resources | | | | | | | |
| Socioeconomics | | | | | | | |

Key: Color = Impacts — LOW | MODERATE | HIGH



OTHER SOCIAL EFFECTS
ALTERNATIVE ANALYSIS

| Factors | Alt. 1.a Buyouts | Alt. 2 1967 Levee | Alt. 3 Optimized Levee | Alt. 4 Wall + Flood Plan | Alt. 5 Wall + Buyout | Alt. 6 Combo: Levee/ Wall/Flood Plan |
|---|---|---|---|---|---|---|
| Historic Significance | | | | | | |
| Life and Safety | | | | | | |
| Community Resiliency | | | | | | |
| Community Cohesion | | | | | | |
| Social Vulnerability | | | | | | |

PROBLEMS

Problem 1: Flooding (low-laying areas in Ward B) and bank inundation flooding

Problem 2: Bank instability-rapid drawdown of floodwaters lead to bank instability of surface soil layers

Problem 3: Structural Damages. leads to damages to historic structures and cultural resources

OBJECTIVES

Objective 1: Reduce Average Annual Flood Damages to structures in Selma, AL.

Objective 2: Stabilize riverbank along the Alabama River

Objective 3: Preserves Historic Structures.

# SCREENED ALTERNATIVES

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## Non-Structural Alternatives

- ~~**Alt. 1.a:** Buyouts~~

## Structural Alternatives

- ~~**Alt. 2:** 1967 Levee - Pump Stations/Culverts/Weirs/Sluice Gates~~
- ~~**Alt. 3:** Optimized (Short) Levee~~
- **Alt 4:** Bankline Stabilization + Floodplain Management/Emergency Evac. Plan

## Combined Alternatives

- ~~**Alt. 5:** Bankline Stabilization + Buyout~~
- ~~**Alt. 6:** Optimized Selma Levee + Buyouts + Soldier Pile Wall~~

### Buyouts Screened

- Shortage of decent, safe and sanitary housing options within the city of Selma
- City of Selma's ability to manage and/or execute this level of relocation assistance/buyouts in accordance with applicable Federal law
- May require involuntary relocation

### 1967 Levee, Pump Stations/Culverts/Weirs/Sluice Gates Screened

- Costly to construct (estimated first cost of nearly $300,000,000)
- Costly to maintain (estimated annual operations and maintenance cost of $184,000)
- Potential environmental and cultural impacts

### Optimized (short) Levee

- Costly to construct (estimated first cost of nearly $74,000,000)*
- Costly to maintain (estimated annual operations and maintenance cost of $27,000)*
- Potential environmental and cultural impacts

* - Does not include mitigation costs for induced flooding to Selmont and other areas.

# TENTATIVELY SELECTED PLAN (ALT 4)

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## Key Features

- Structural:
  - Bankline Stabilization (Retaining Wall) = 750ft
- Nonstructural:
  - Floodplain Management/Emergency Evacuation Plan

## Direct Environmental Impacts & Concerns

- Likely to adversely affect Tulotoma snail
- Unexploded Ordnance (Civil War Era)

## Total Project Cost

- First Cost: $27,537,000
- Federal Cost (65%): $17,899,050
- Non-Federal Cost (35%): $9,637,950

## NET Benefits:

- NED Exception Approved by ASA(CW)
- OSE Benefits:
  - Maintains Community Cohesion
  - Reduces Erosion and Stabilizes River Bankline
  - Reduces Damages to Historic Structures





SOLDIER PILE WALL CROSS SECTION VIEW

# TSP - CONSTRUCTION COST

| CONSTRUCTION COST (OCTOBER 2019 PRICE LEVEL) | | | |
|---|---|---|---|
| **COST ITEM** | **FEDERAL (USACE)** | **NON-FEDERAL Sponsor** | **PROJECT FIRST COST** |
| Initial Construction* | $17,899,000 | $9,258,000 | $27,157,000 |
| Lands, Easements, Right of Way and Relocations** | $0 | $380,000 | $380,000 |
| **First Costs by Entity** | **$17,899,000** | **$9,638,000** | **$27,537,000** |
| Cost Share Percentages | 65% | 35% | |
| **OMRRR** | | **$4,000** | |

***Numbers are rounded and includes PED and Construction Mgmt. Fee**
****LERRDS Disclaimer: Subject to change based on appraisal, actual costs and RE review of credit package. **Sponsor may receive credit for some cost associated with acquisition and other RE fees TBD after ADM.**

# TO SUBMIT COMMENTS

**Comments will be accepted through October 16, 2020**

## Email Address

SelmaFRM@usace.army.mil

## Physical Address

U.S. Army Corps of Engineer Mobile District

ATTN: CESAM-PD

P.O. Box 2288

Mobile, Alabama 36628-0001

## Project Website

https://www.sam.usace.army.mil/Missions/Program-and-Project-Management/Civil-Projects/Selma-Alabama-Flood-Risk-Management-Feasibility-Study/

# QUESTIONS?

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