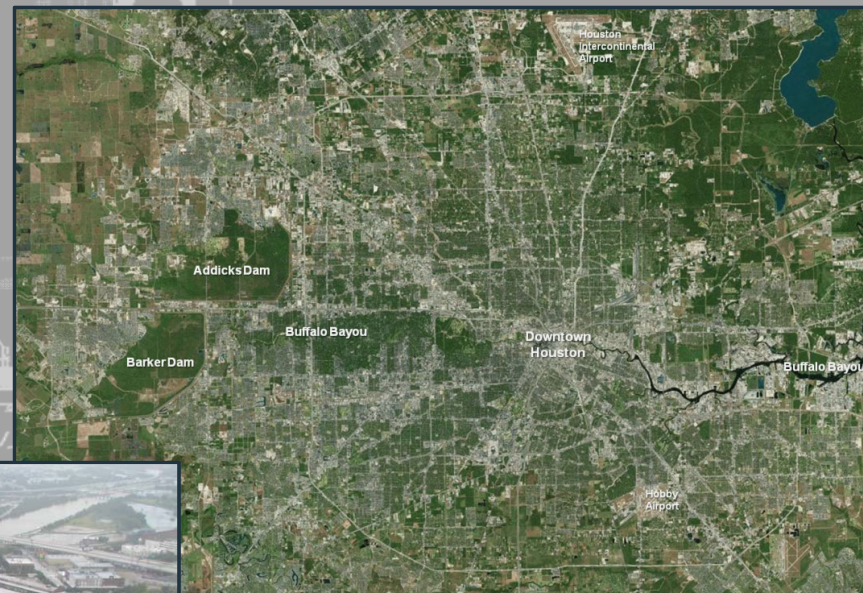


# Buffalo Bayou and Tributaries Resiliency Study

Public Meetings

30 April; 2, 7-9 May, 2019

Andrew Weber, P.E. – Project Manager



*"The views, opinions and findings herein are those of the author and are not to be construed as an official Department of the Army position or official documentation."*





# Presentation Purpose & Agenda

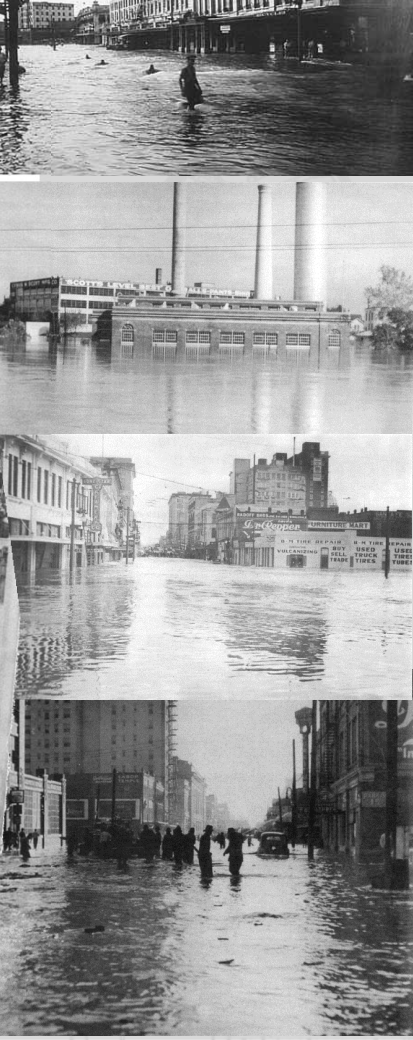
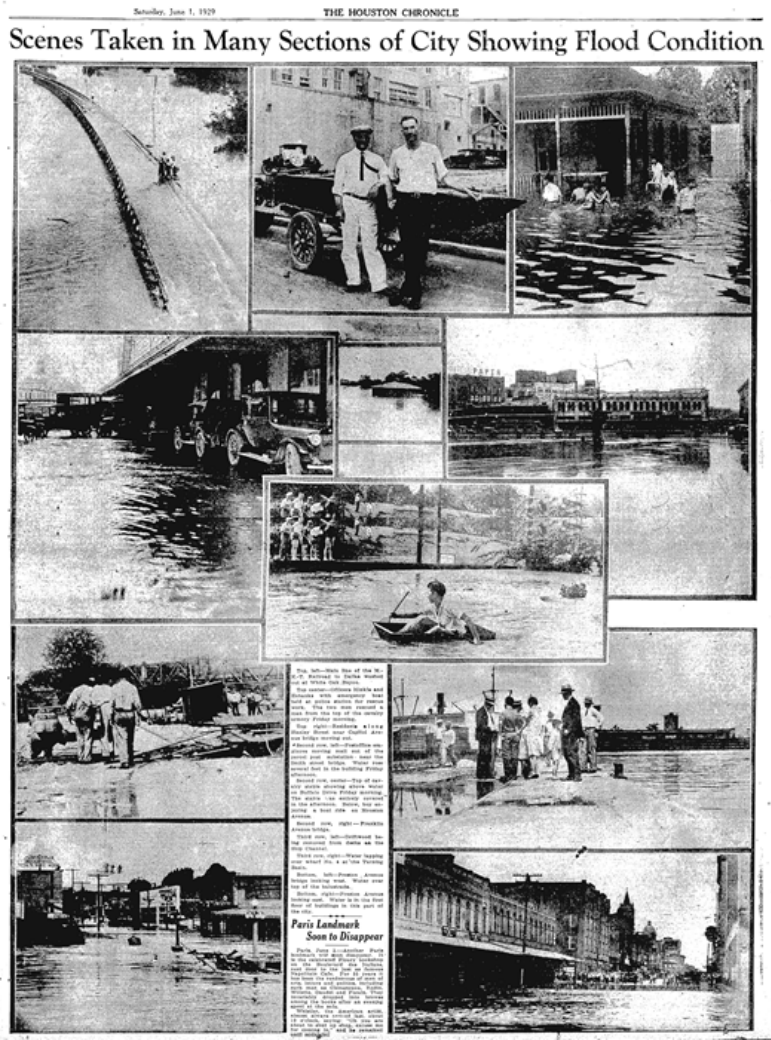
Purpose: To provide an update on the Buffalo Bayou & Tributaries Resiliency Study to include and solicit public comment. This presentations will include:

- Background
- Study Overview
- The Public Scoping Process
- Study Update
- Path Forward

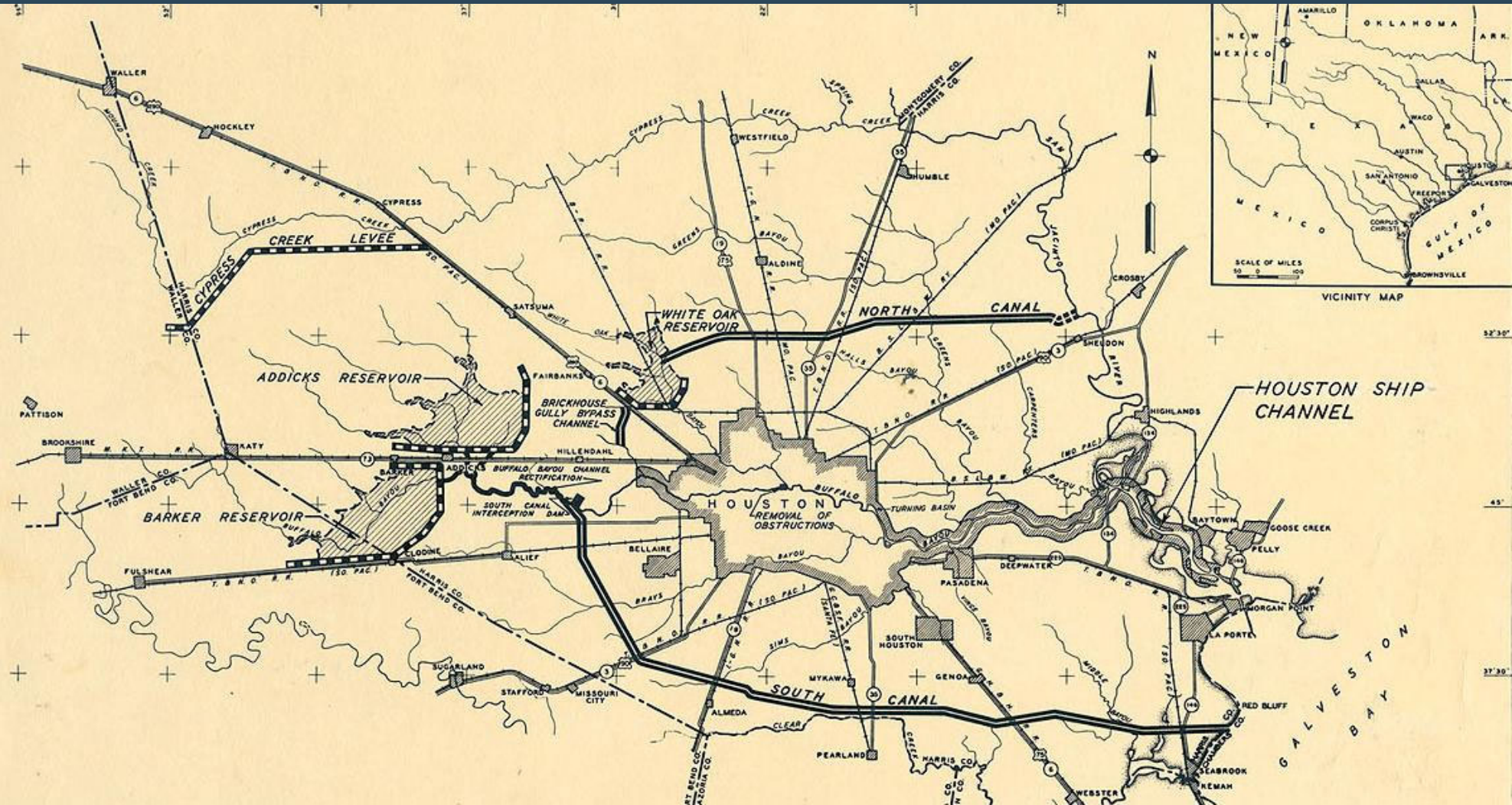


# Early Houston Floods

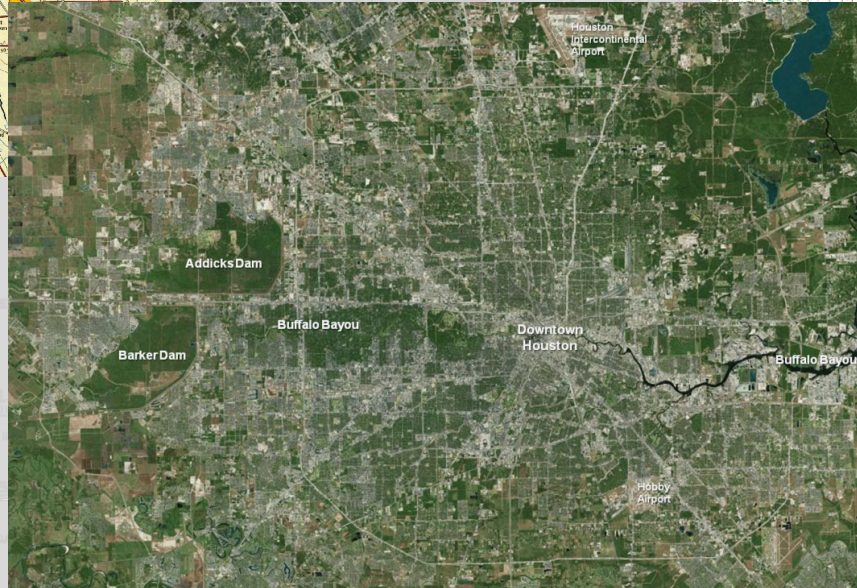
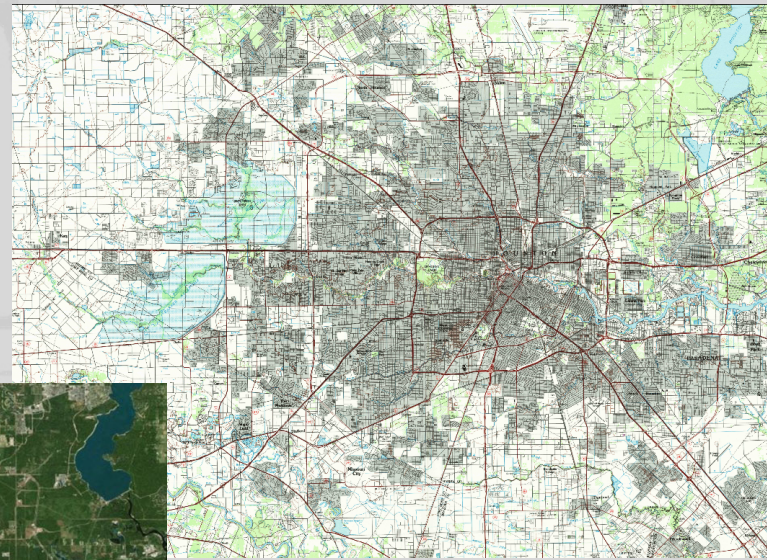
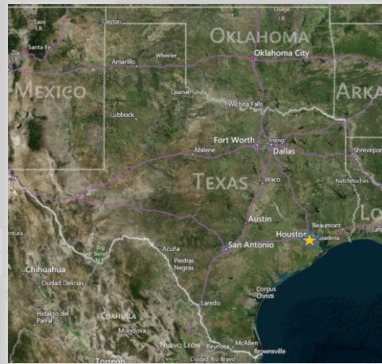
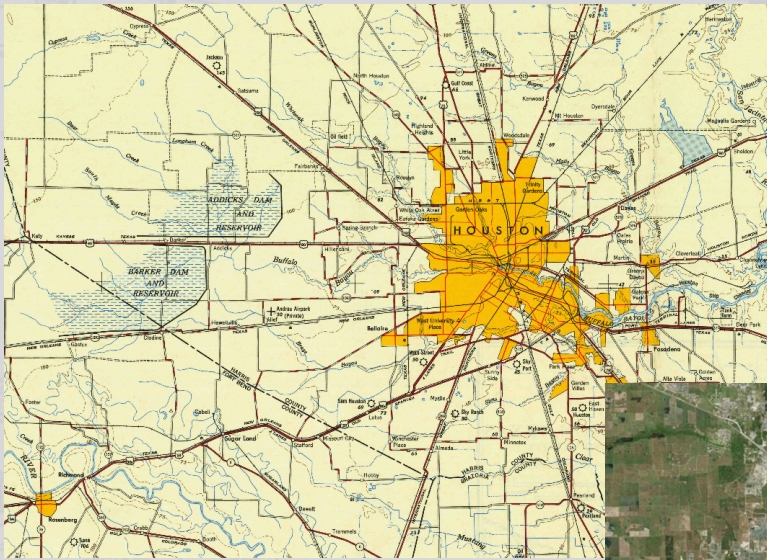
31 May 1929, 1-2 June 1929 and 7-10 December 1935



# Buffalo Bayou & Tributaries 1940's Original Plan



# Houston 1950, 1992, 2016



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# Study Summary

**Study:** Buffalo Bayou & Tributaries Resiliency Study

**Authorization:** Section 216 of Flood Control Act of 1970

**Appropriation:** Bipartisan Budget Act of 2018

**Budget:** \$6 Million (100% Federal)

**Purpose:** Flood Risk Management (FRM)

**Non-Federal Sponsor:** Harris County Flood Control District

**Study Start:** October 2018

**Scheduled Completion:** October 2021

**Scope:**

To identify, study, and recommend measures to address flood risk along Buffalo Bayou

To perform a Dam Safety Modification Evaluation on Addicks and Barker Dams, and if necessary, identify, study, and recommend measures to reduce risks associated with the structural performance of the dams.



# Public Scoping Period

- **Public Scoping Period: 29 April – 31 May 2019**

- **Public Scoping Meetings**

1. April 30, 2019 from 5-8 p.m. - Kingsland Baptist Church Activity Center, 20555 Kingsland Blvd, Katy, TX 77450
2. May 2, 2019 from 5-8 p.m. - St John Vianney Catholic Church Activity Center, 625 Nottingham Oaks Trail, Houston, TX 77079
3. May 7, 2019 from 5-8 p.m. - Trini Mendenhall Community Center, 1414 Wirt Rd, Houston, TX 77055
4. May 8, 2019 from 5-8 p.m. - UofH DT, Wilhelmina Cullen Robertson Auditorium, 3rd Floor (Main St Level) of Academic building, 1 Main St, A350, Houston, TX 77002
5. May 9, 2019 from 6-9 p.m. - Cypress Ridge High School, 9th grade cafeteria, 7900 N. Eldridge Parkway, Houston, TX 77041.  
\*Presentations at 6:30, 7:30, and 8:30

**Format: Open House, with formal presentation at 5:30, 6:30, 7:30, unless otherwise noted.**

**All material & presentations will be the same for each meeting.**

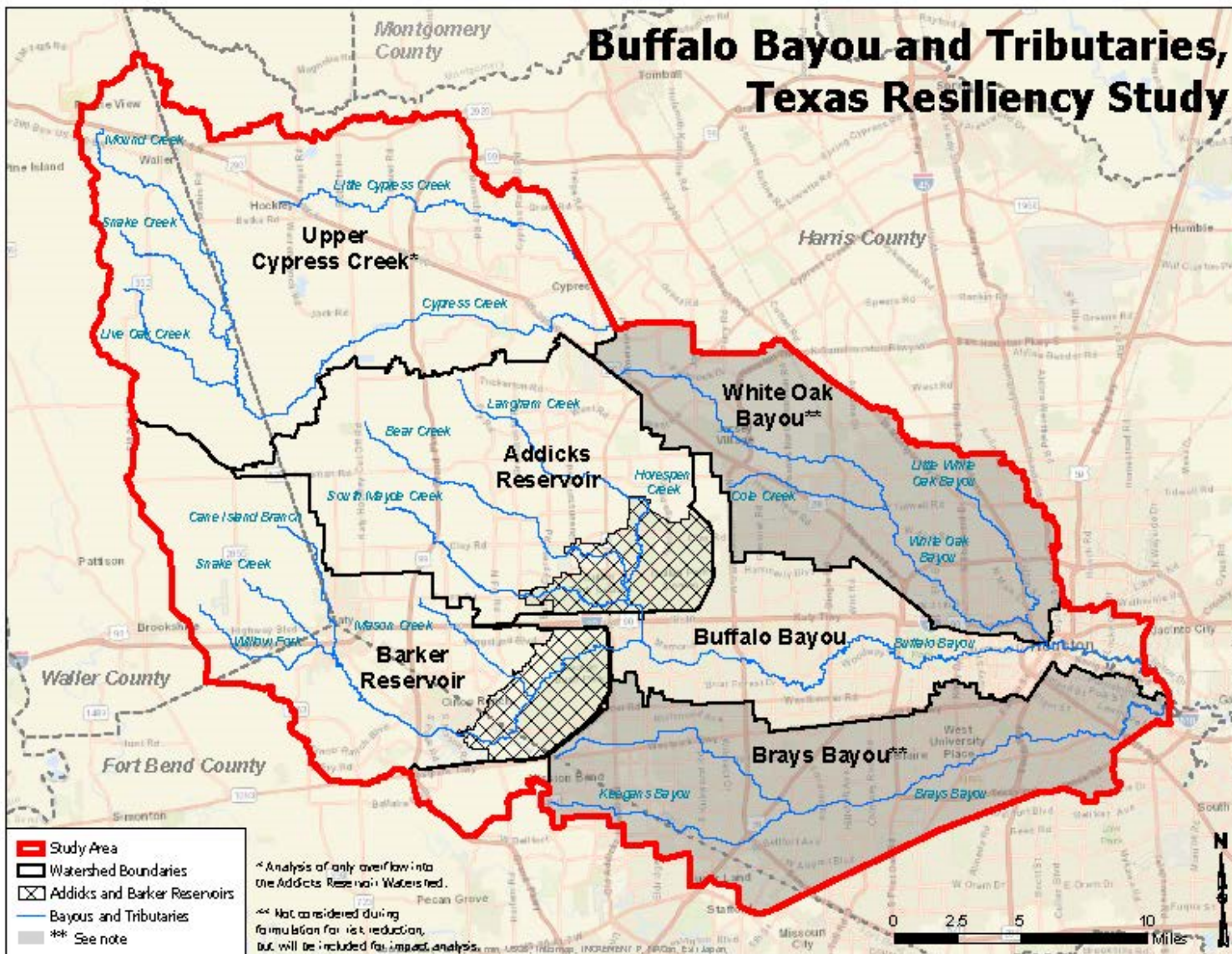
**Submit Your Comment:**

1. **Comment card at public meeting**
2. **Email: [BBTRS@usace.army.mil](mailto:BBTRS@usace.army.mil)**
3. **Mail to: USACE, Galveston District, ATTN: BBTRS  
P.O. Box 1229  
Galveston, TX, 77553**





# Buffalo Bayou and Tributaries, Texas Resiliency Study







# Study Problems

## Problems:

Three primary problem areas have been identified.

1. Flooding downstream of the reservoirs on Buffalo Bayou (Dam Surge Releases and from other non-impounded rainfall)
2. Flooding Upstream of the reservoirs from impoundment of water above government owned land and natural runoff traveling to the reservoirs.
3. Performance and risk issues related to flow around and over the uncontrolled spillways.



# Buffalo Bayou



Event Date	HWM
Harvey-2017	71.6
4/28/09	65.4
3/4/92	64.5
4/18/16	65.3
5/26/15	62.9



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# Barker Reservoir



## Top 5 Pools

Date	Elevation
Harvey - 2017	101.6
Apr 2016	95.22
Mar 1992	93.60
Nov 2002	93.24
Nov 1998	92.31



# Addicks Reservoir



## Top 5 Pools

Date	Elevation
Harvey - 2017	109.1
Apr 2016	102.65
Mar 1992	97.64
Apr 2009	97.08
Nov 2002	96.63



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# Study Goal and Objectives

**Goal:** Improve the effectiveness of Addicks and Barker project and reduce the upstream and downstream flood risks along Buffalo Bayou and Tribs.

## Objectives

- Reduce damages from river flooding/reservoir pool flooding on channels upstream and downstream
- Optimize the reservoir operations
- Optimize/improve/safely convey detained water
- Reduce sediment and erosion
- Reduce risk of dam failure
- Reduce risk to health and life safety



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# Study Opportunities & Constraints

## Opportunities

- Improve transportation reliability during flood events
- Engineer with nature and implement nature-based features
- Increase public awareness and education
- Improve flood forecasting and also improve emergency response and coordination
- Provide increased recreational opportunities

## Constraints

- No unmitigated adverse impacts
- Limited open land
- Historic opposition to environmental impacts on Buffalo Bayou



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# Potential Measures

## STRUCTURAL

- Tunnels
- Bypass
- Diversion
- Levees
- New Reservoir/Dam
- Detention
- Channel Improvements
- Sedimentation Basin
- Increase Reservoir Storage
- Auxiliary Spillway Improvements
- Remove Dams
- Modify Existing Discharge Capacity
- Relocation of Auxiliary Spillway

## NON-STRUCTURAL

- Change Release Schedules in the Addicks and Barker Water Control Manual
- Buyout/Acquisition
- Dry/Wet Flood Proofing
- Flood Warning Systems
- Signage
- Public Education/Outreach about Risk
- Update Emergency Action Plan/Hazard maps



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# Alternatives Development

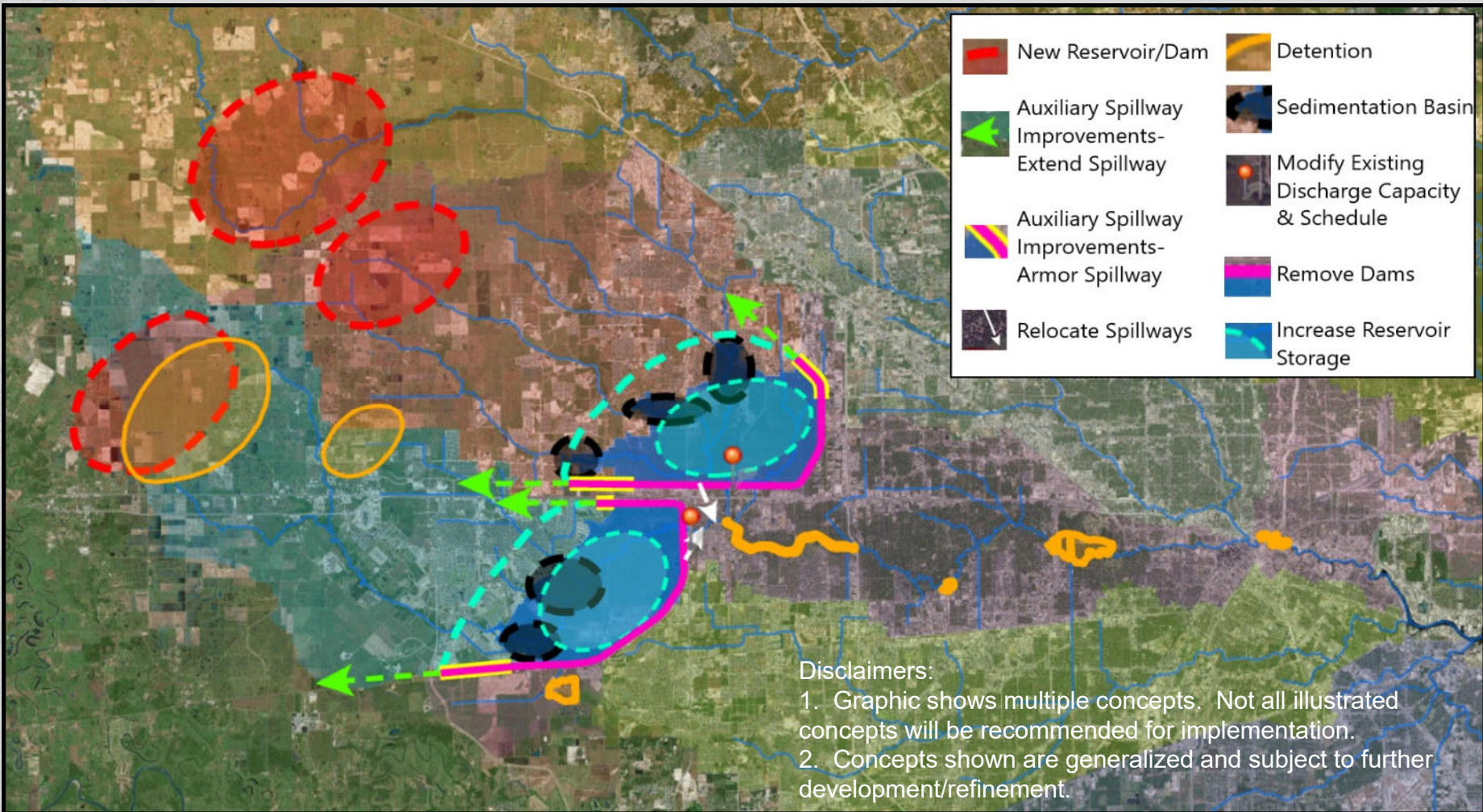
## Strategies for combining measures into alternatives

- Storage –
  - Detention
  - Levees/Floodwalls
  - Increase Reservoir Storage
  - New Reservoir/Dam
  - Sediment Sump
- Conveyance – to effectively move water
  - Tunnels
  - Bypass
  - Diversion
  - Channel Improvements
- Dam Safety –
  - Additional Spillway
  - Auxiliary Spillway Improvements
  - Relocate Auxiliary Spillway
  - Remove the dams












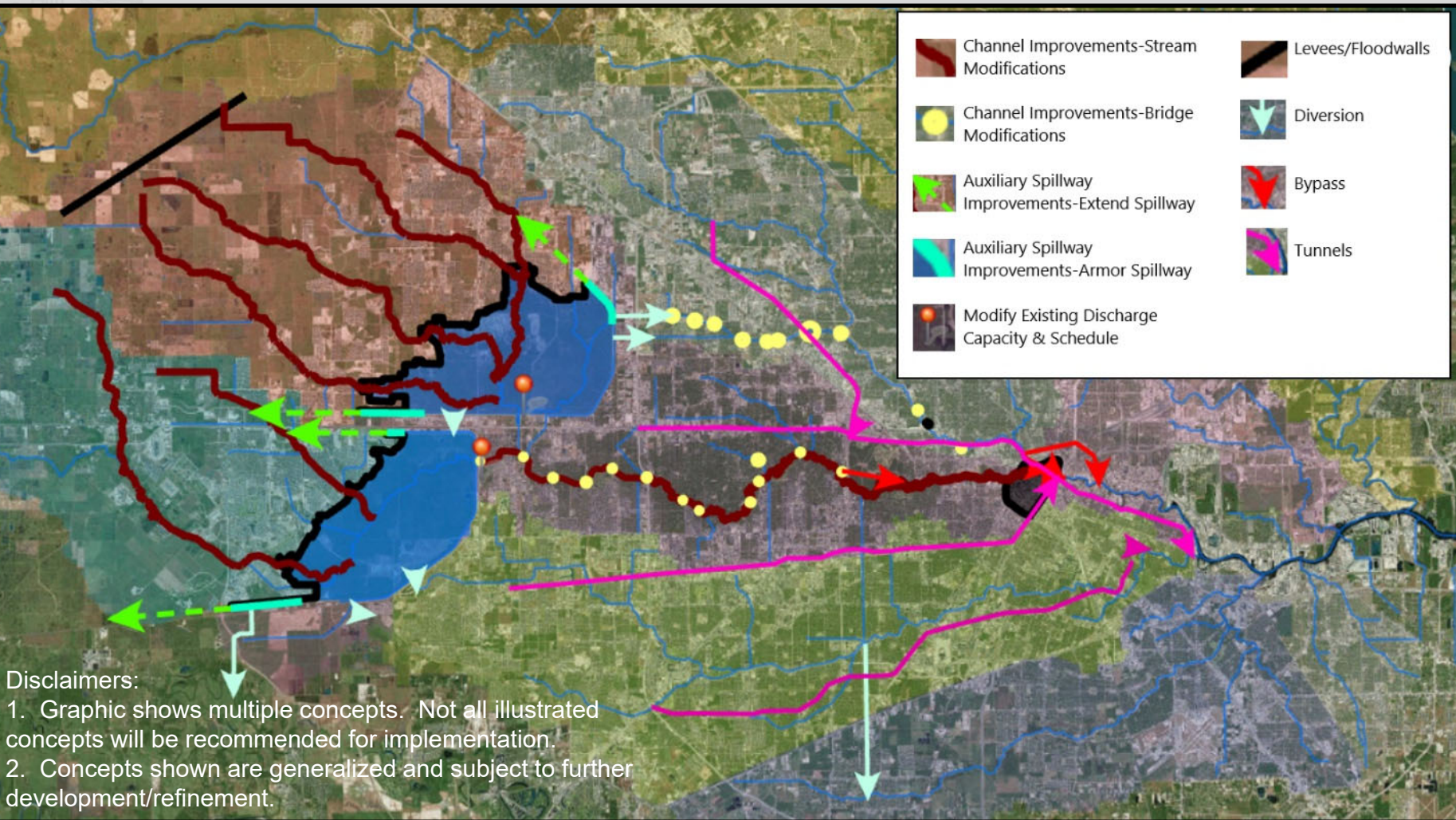


# Storage Strategies



# Conveyance Strategies

 Channel Improvements-Stream Modifications	 Levees/Floodwalls
 Channel Improvements-Bridge Modifications	 Diversion
 Auxiliary Spillway Improvements-Extend Spillway	 Bypass
 Auxiliary Spillway Improvements-Armor Spillway	 Tunnels
 Modify Existing Discharge Capacity & Schedule	



Disclaimers:  
1. Graphic shows multiple concepts. Not all illustrated concepts will be recommended for implementation.  
2. Concepts shown are generalized and subject to further development/refinement.



# Array of Alternatives

## Strategies for combining measures into alternatives

- Anchor Measures
  - Potential to have system wide impact.
  - Potential to generate the majority of benefits by itself

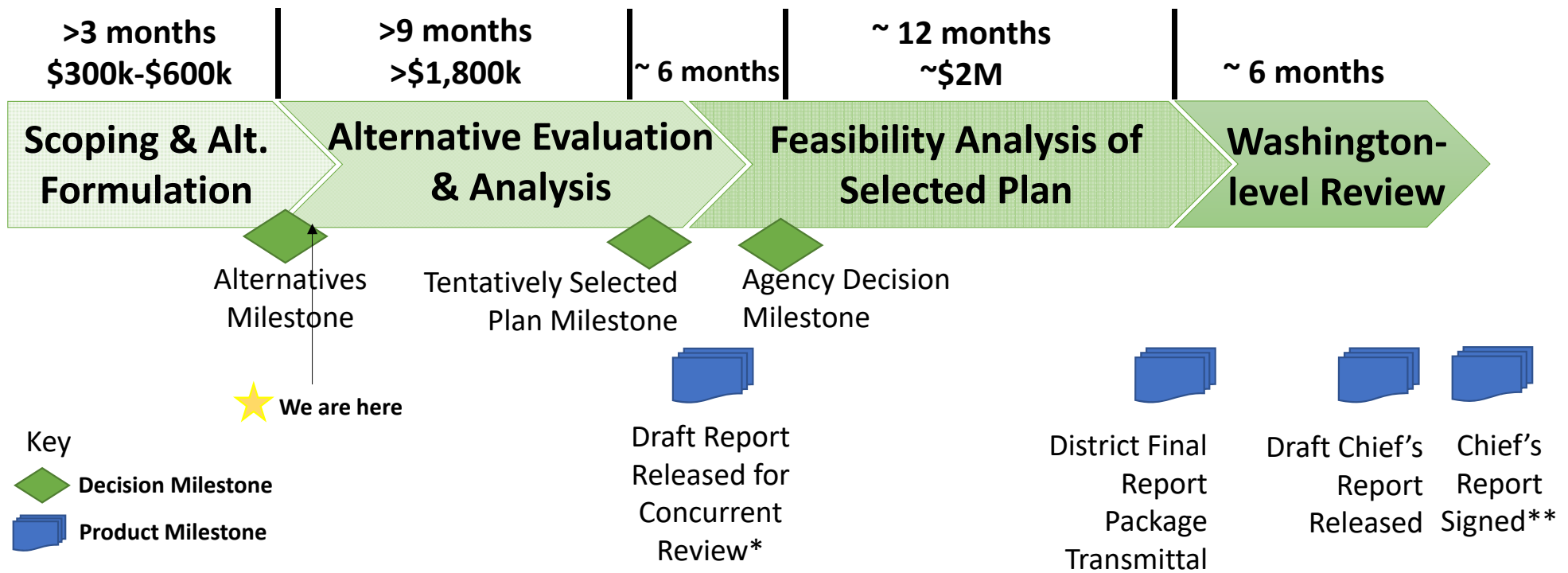
	Storage		Conveyance			Dam Safety	Comprehensive	Nonstructural
Alt #1	Alt #2 S1	Alt #3 S2	Alt #4 C1	Alt #5 C2	Alt #6 C3	Alt #7 Dam Safety	Alt #8	Alt #9
No Action	New Reservoir/Dam	Increase Reservoir Storage	Tunnels	Diversion	Channel Improvements	Auxiliary Spillway Improvements	Best of S & C	Nonstructural



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# The Feasibility Study Process: Approximate Times to Reach Key Decision & Product Milestones in a 3-Year, \$6M Study



\*Scheduled Summer 2020

\*\*Scheduled October 2021

# Upcoming Activities

- **Continued Concept Development**
  - **Engineering**
  - **Environmental & Cultural**
  - **Real Estate**
  - **Cost**
  - **Economics**
- **Evaluation & Comparison of Alternatives**
- **Tentatively Selected Plan Milestone – April 2020**
- **Draft Report & Public Review Period – June 2020**
- **Chiefs Report – October 2021**



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# Questions



**Thank You**

**Follow the study:**  
email: [BBTRS@usace.army.mil](mailto:BBTRS@usace.army.mil)  
<https://www.swg.usace.army.mil>



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