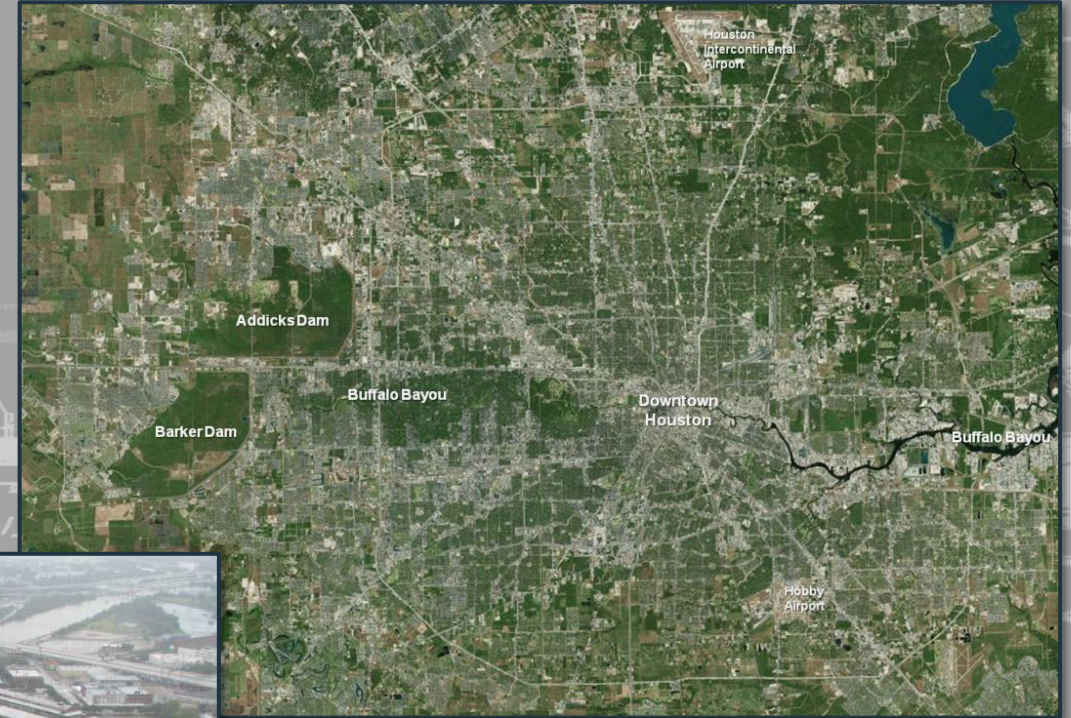


Buffalo Bayou and Tributaries Resiliency Study Update

Spring Partnering Forum
27 March 2019

Andrew Weber, P.E. – Project Manager



"The views, opinions and findings are those of the author and do not necessarily reflect those of the Department of the Army or the United States of America."



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Purpose & Agenda

Purpose: To provide an update on the Buffalo Bayou & Tributaries Resiliency Study to include:

- Background
- Study Update
- Path Forward

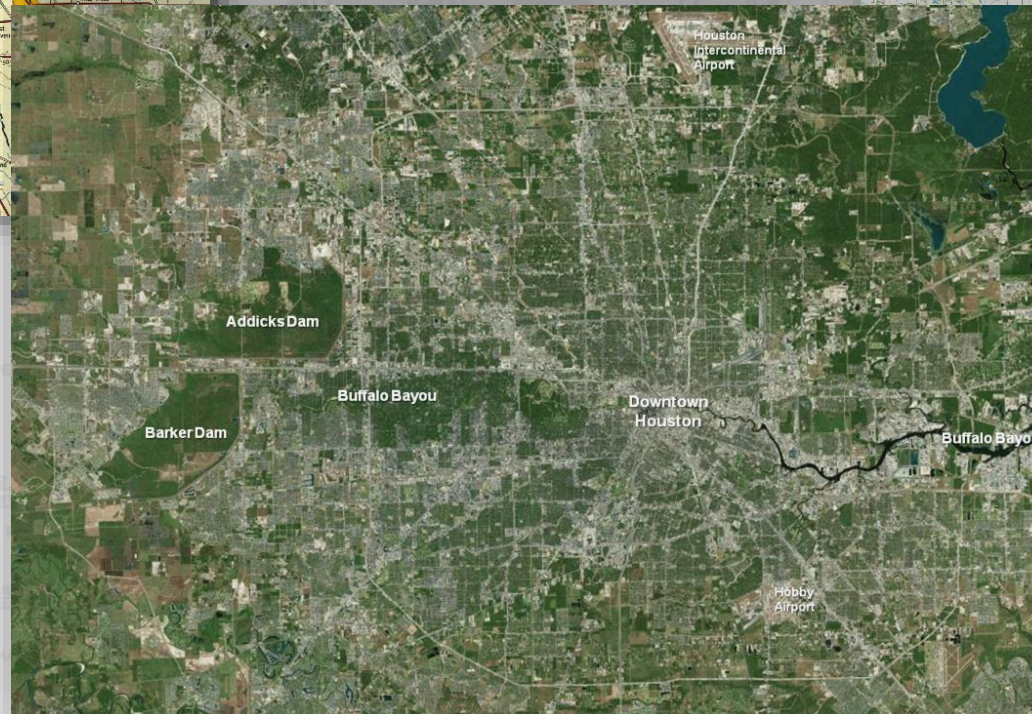
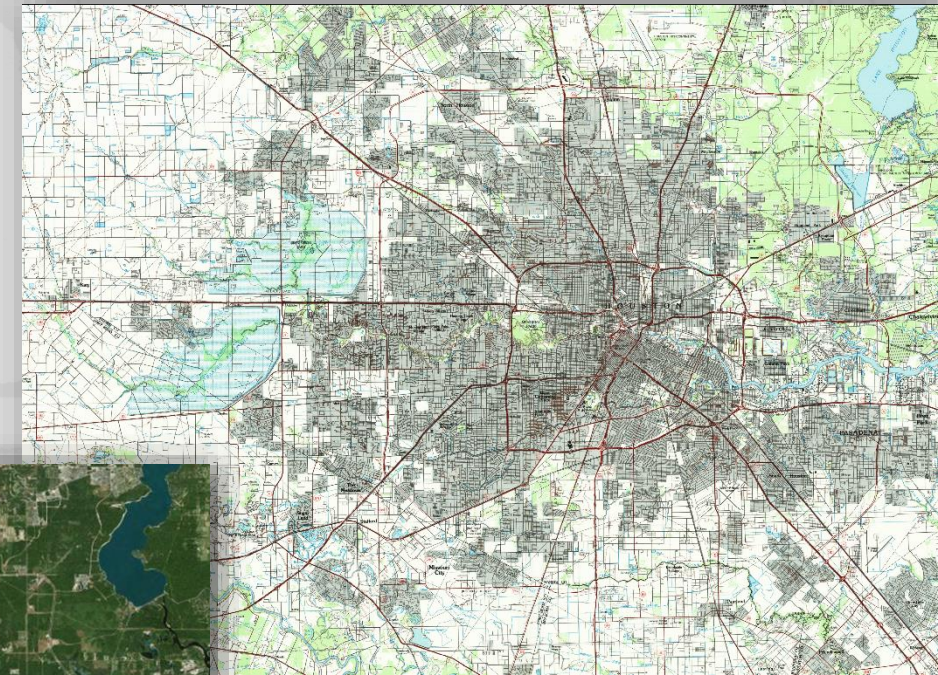
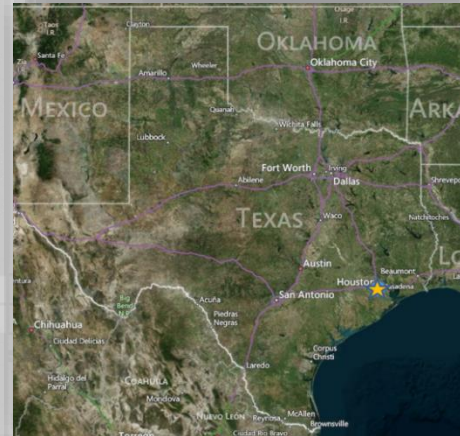
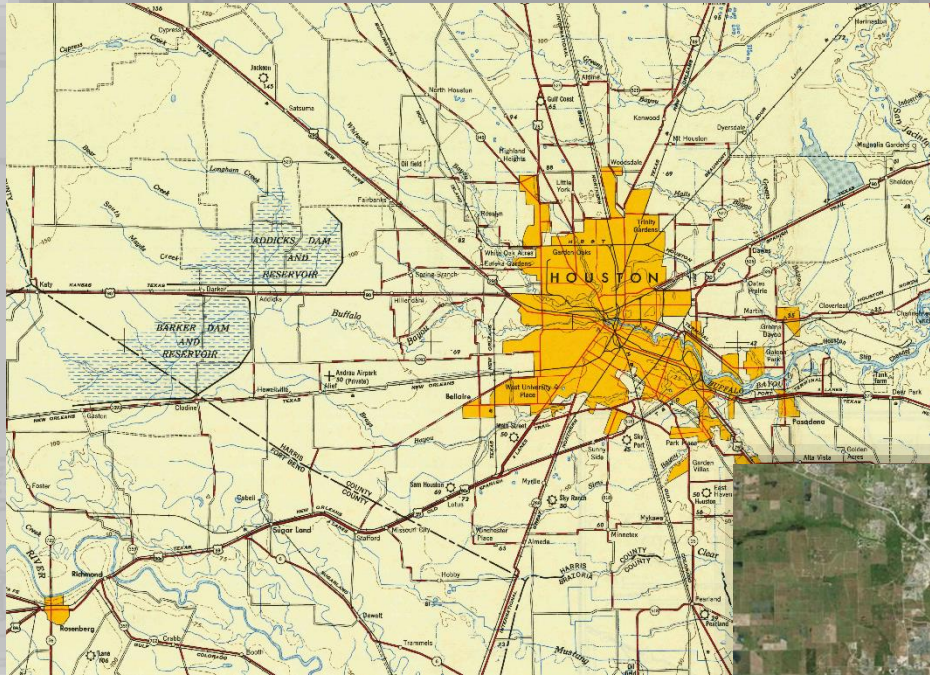


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Houston 1950, 1992, 2016

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Study Summary

Study: Buffalo Bayou & Tributaries Resiliency Study

Authorization: Section 216 of Flood Control Act of 1970

Purpose: Flood Risk Management (FRM)

Phase: Feasibility

Non-Federal Sponsor: Harris County Flood Control District

BBA18 Funding: \$6M

Scope: Address residual risks associated with flood risk impacts to structures in the pool area upstream of both reservoirs and downstream along Buffalo Bayou

Potential FRM Measures:

- Additional reservoir/dam
- Increased reservoir storage capacity
- Reservoir water level equalization
- Improved outlet discharge capacity
- Improved inflow and outlet discharge channels
- Acquisition of flowage easements and buyouts
- Changes in dam operation plan
- Harris County may develop ways to better inform residents of their risks

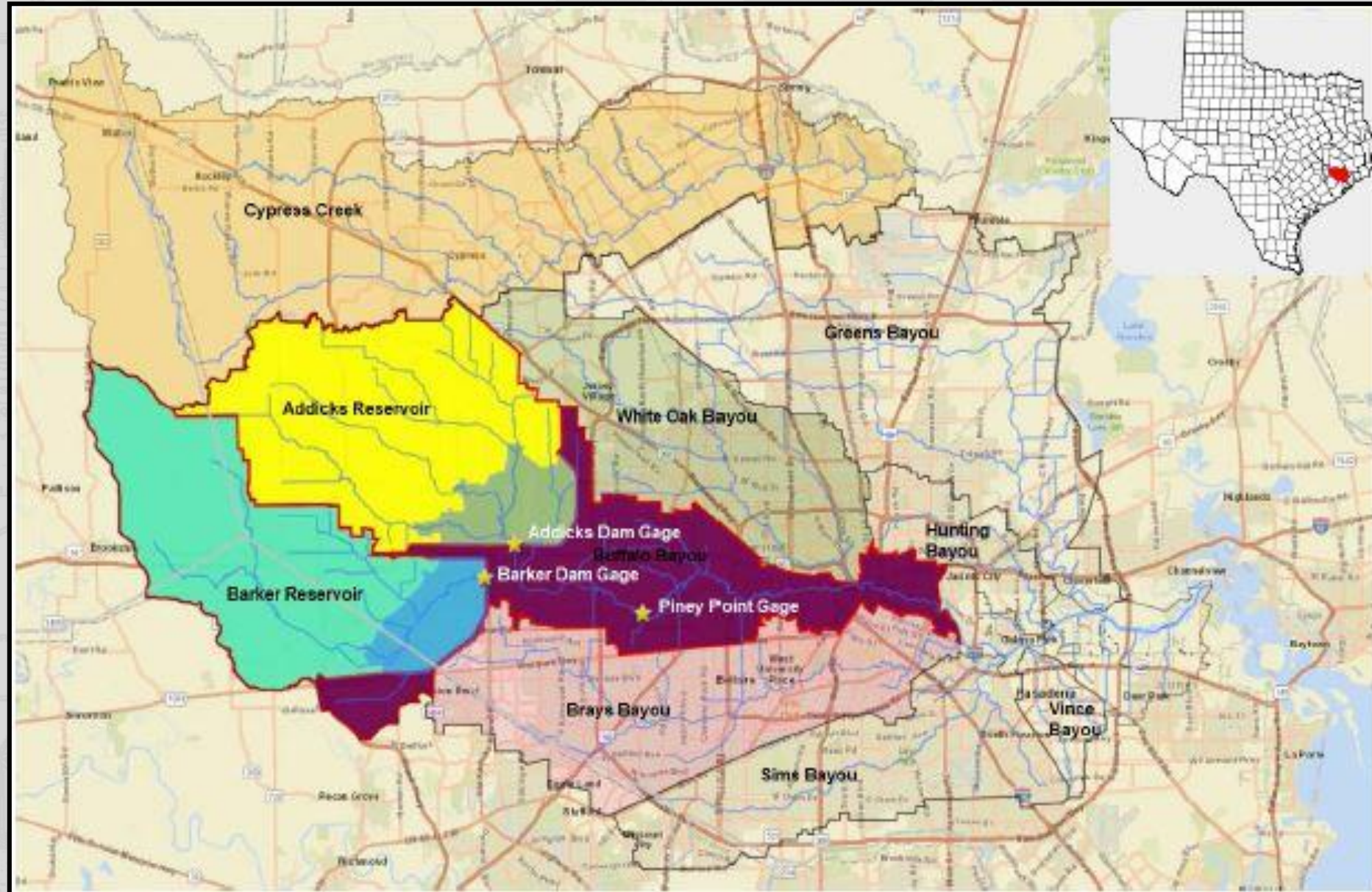


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Project Location



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Study Problems

Problems:

Three primary problem areas have been identified.

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



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Buffalo Bayou



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



Addicks Reservoir



Top 5 Pools

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



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Barker Reservoir



Top 5 Pools

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





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
- Develop flood damage components that enhance or compliment the environment where possible
- Analyze the potential for recreational opportunities



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Study Opportunities & Constraints

Opportunities

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

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

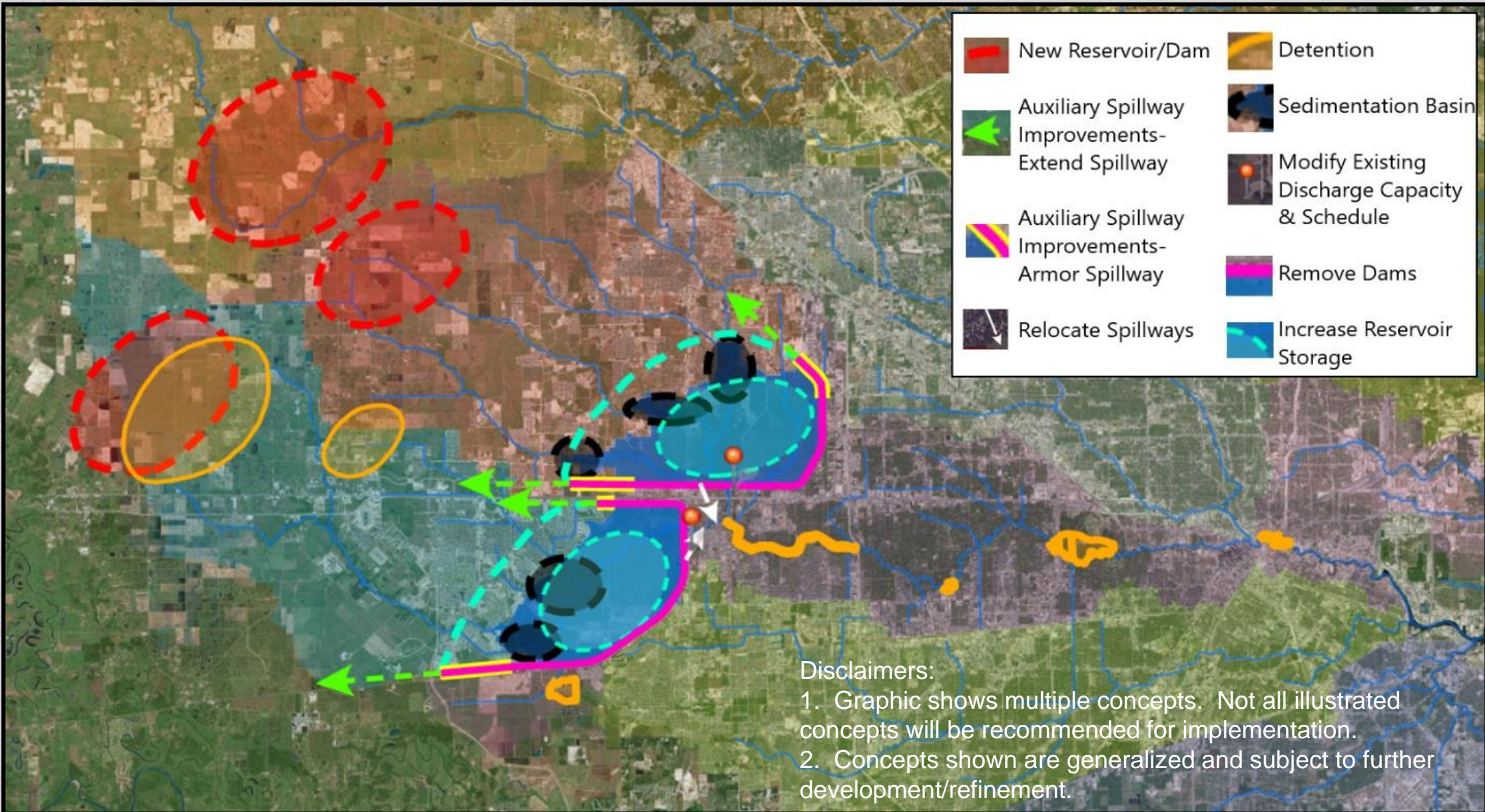
- Storage –
 - Detention
 - Levees/Floodwalls
 - Increase Reservoir Storage
 - New Reservoir/Dam
 - Sediment Sump
- Conveyance – to effectively move water
 - Tunnels
 - Bypass
 - Diversion
 - Channel Improvements
- Dam Safety –
 - Additional Spillway
 - Auxiliary Spillway Improvements
 - Relocate Auxiliary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



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Storage Strategies

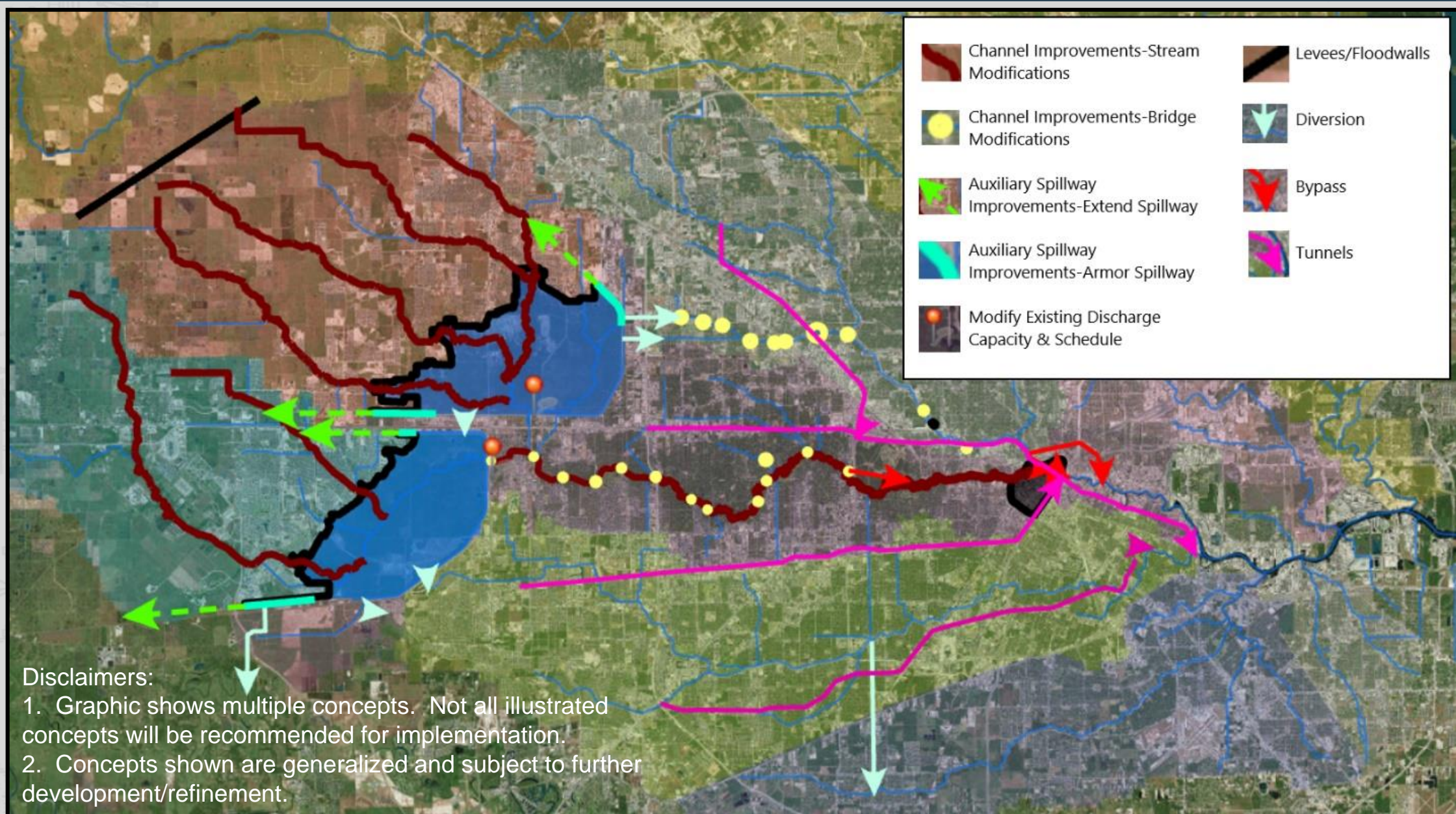


Disclaimers:

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.



Conveyance Strategies



Array of Alternatives to be Carried Forward

	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		Best of S & C	Nonstructural

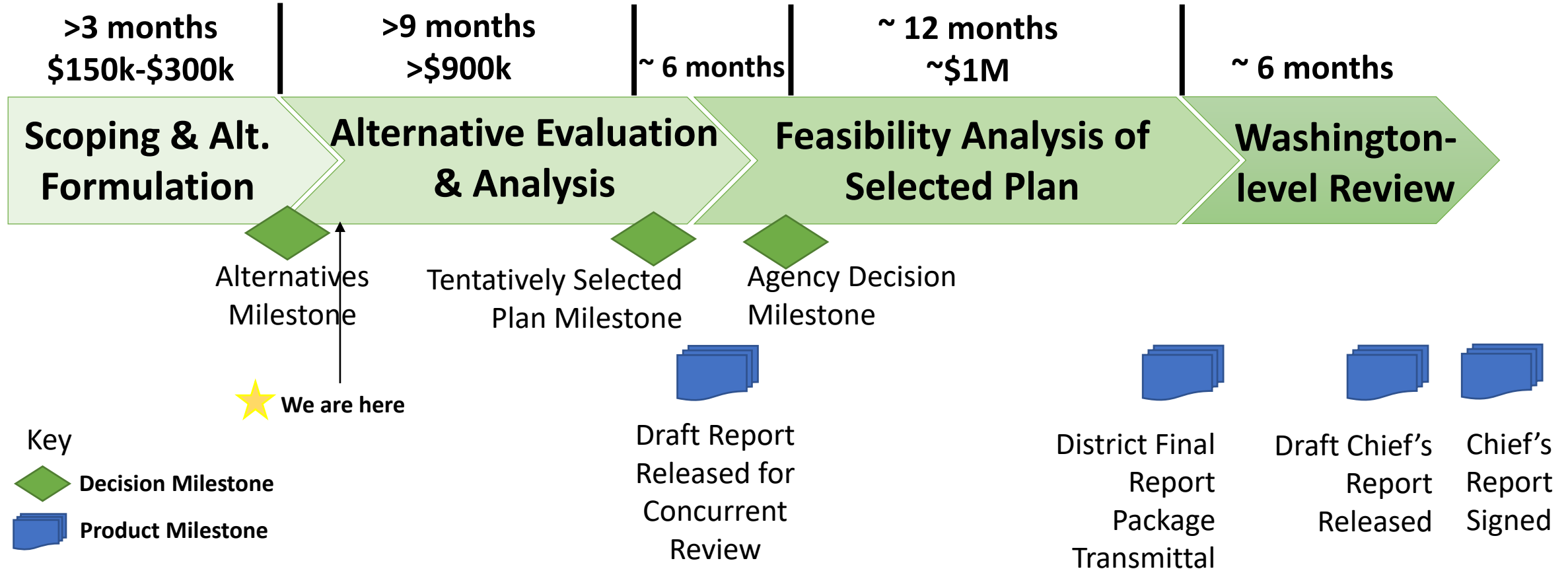


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The Feasibility Study Process:

Approximate Times to Reach Key Decision & Product Milestones in a 3-Year, \$3M Study



Upcoming Activities

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- Continued Concept Development
 - Engineering
 - Economics
 - Environmental & Cultural
 - Real Estate
 - Cost
- Resource Agency Coordination – Kickoff 27 March
- Public Scoping Meetings (April/May 2019 details tbd)
- 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

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Thank You

Follow the study:
email: BBTRS@usace.army.mil
<https://www.swg.usace.army.mil>



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