



BASTROP COUNTY TWDB FLOOD PROTECTION PLANNING STUDY ALUM CREEK

OCTOBER 7, 2020

VIRTUAL WEBEX MEETING

<https://bit.ly/2RsByZs>



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BASTROP COUNTY TWDB FLOOD PROTECTION PLANNING STUDIES

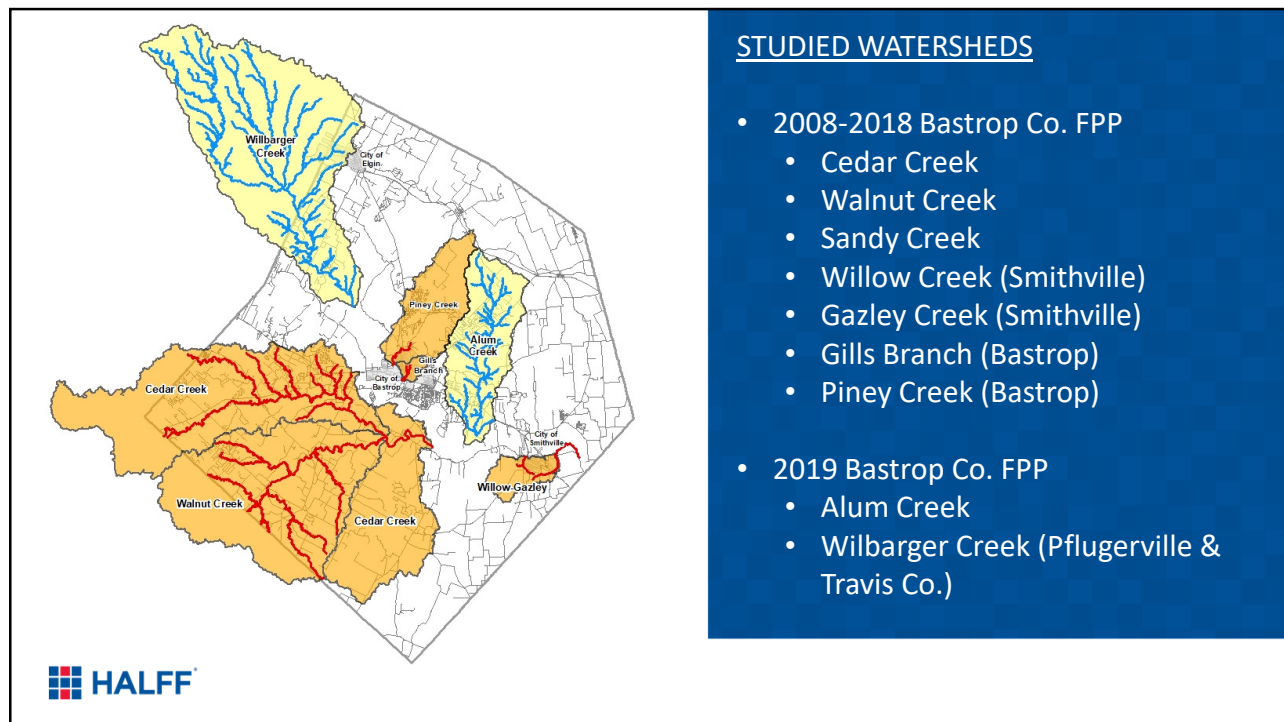


AGENDA OUTLINE

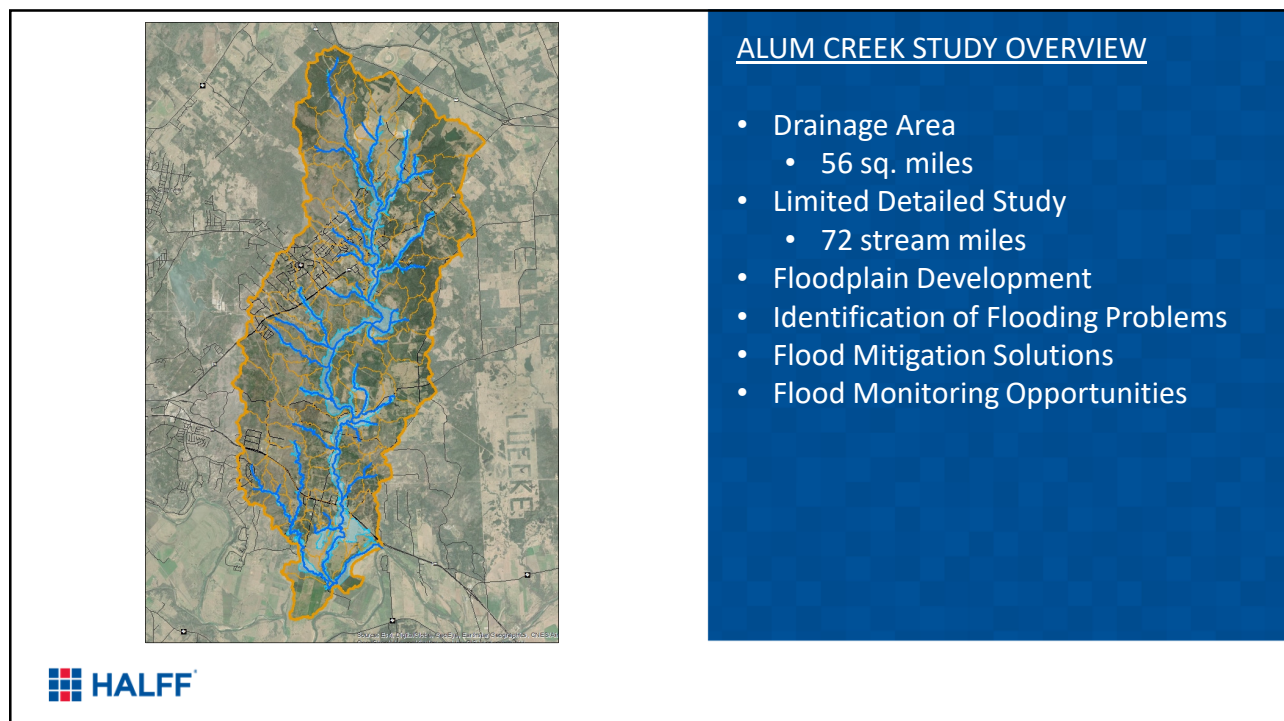
- COUNTY FPP STUDIES
- ALUM CREEK WATERSHED
- H&H METHODOLOGY
- FLOOD MITIGATION SOLUTIONS
- FLOOD MONITORING OPPURTUNITIES
- NEXT STEPS



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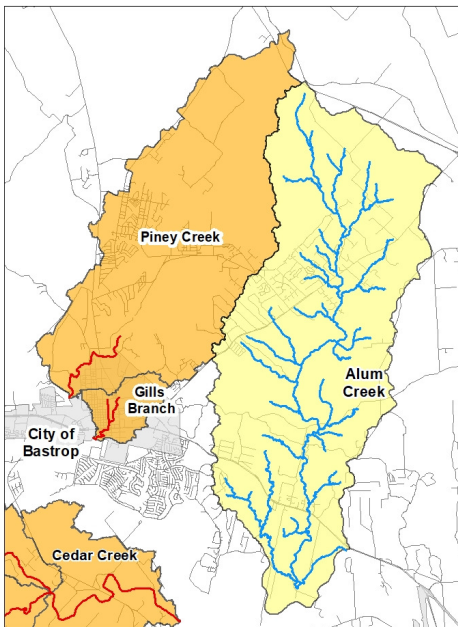
BASTROP COUNTY TWDB FLOOD PROTECTION PLANNING STUDIES

2019 LEVERAGED FUNDING FOR ALUM CREEK

Texas Water Development Board	50%
<u>Bastrop County</u>	<u>50%</u>
Total	100%



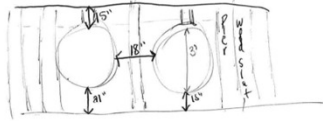
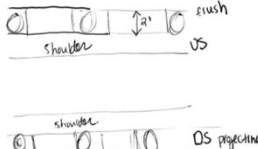


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DATA COLLECTION

- Public Flood Problem Survey
- 2017 LiDAR terrain
 - Hydrology: 10'x10' DEM
 - Hydraulics: 3'x3' DEM
- SSURGO Soil Survey
- NLCD Land Use
- Field Reconnaissance
 - Field measurements
 - Field Sketches
 - Photos

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HALFF		Survey Field Sheet	
PROJECT: <u>Bastrop FPP AVO35837</u>		SURVEY NAME:	
STREAM NAME: <u>Alum Creek Trib 4</u>		DATE: <u>04-15-19</u>	
LOCATION: <u>AL T4 STR 200, creek #1</u>		CREW: <u>KS+ML</u>	
TYPE: <u>BR</u> <u>()</u> <u>CUL</u> <u>()</u> <u>DAM</u> <u>()</u> <u>XSI</u> <u>()</u>		ERM ELEV: _____ ERM ID: _____ GEOID: _____	
BRIDGE: Height: <u>N/A</u> Deck: <u>15'</u> Width: <u>25'8"</u> Pier(s): _____ @ _____ Pier Shape: _____			
CULVERT: Number: <u>2</u> Shape: <u>O</u> Length: <u>31.1'</u> Height: <u>5'</u> Width: <u>3'</u> Skew: <u>small</u>			
DAM: Top Width: _____ Side Slope: _____ Side Slope: _____ US: _____ DS: _____ Outlet: _____			
ERM Description: _____			
Photo Numbers: USC: <u>1</u> USF: <u>2</u> DSF: <u>3</u> DSC: <u>4</u> DLS: <u>DSR6</u>			
Additional Info: <u>dry channel, rocky bottom, skewed</u>			
File Name: _____			
<p>PROFILE VIEW: (Left to Right looking Downstream)</p> 			
<p>PLAN VIEW:</p> 			
		<p>Photo ID: <u>AC_T4_STR_200_DSF</u> Coordinates: <u>30.149992, -97.235395</u> Description: <u>Downstream face</u></p>	
		<p>Photo ID: <u>AC_T4_STR_200_DSC</u> Coordinates: <u>30.149992, -97.235395</u> Description: <u>Downstream channel</u></p>	
035837.001 - Bastrop County Flood Protection Planning Studies - Alum Creek H&H - AC_T4_STR_200			

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HYDROLOGY (RAINFALL RUNOFF)

1. RAINFALL

- Source: NOAA Atlas 14
- Distribution

2. TOPOGRAPHY (GROUND SURFACE)

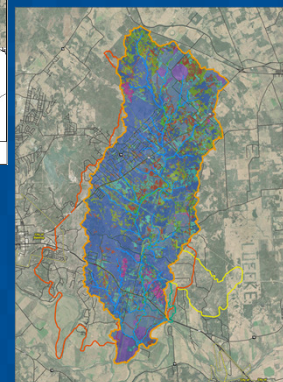
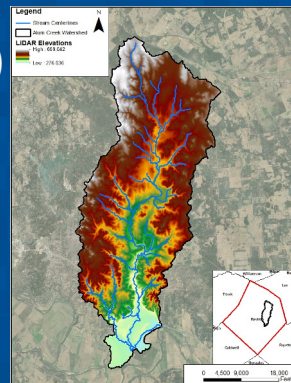
- LiDAR
- Watershed Boundaries
- Watershed Slopes

3. SOILS

- Hydrologic Soil Types
- Antecedent Moisture Condition
- Considered Burn Scars

4. LAND USE

- Existing Conditions



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HYDRAULICS (CREEK FLOODING)

1. HYDROLOGY

- Peak Discharge – 2, 5, 10, 25, 50, 100, and 500-year

2. TOPOGRAPHY (GROUND SURFACE)

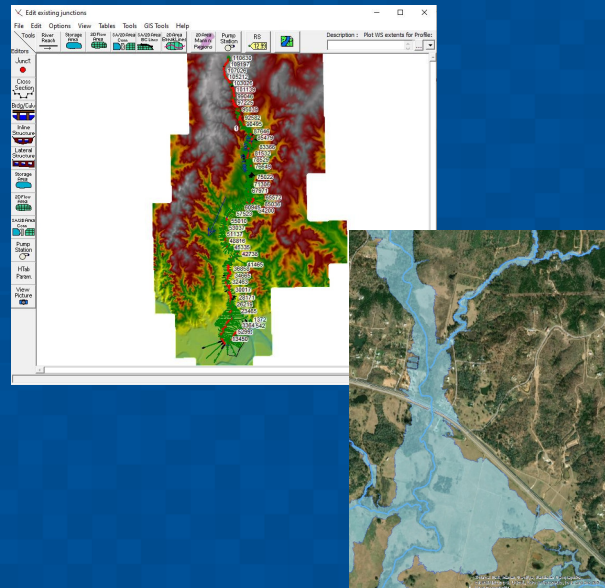
- LiDAR
- Stream Slope/Definition

3. CROSS-SECTION

- Location
- Roughness Coefficients (N-values)
- Expansion/Contraction Coefficients
- Ineffective/Blocked Areas

4. CROSSINGS/CONSTRICTIONS

- Bridges
- Culverts
- Small Stock Ponds



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FLOODPLAIN MAPPING (FLOOD EXTENTS)

1. TOPOGRAPHY (GROUND SURFACE)

- Drainage patterns

2. CROSS-SECTION

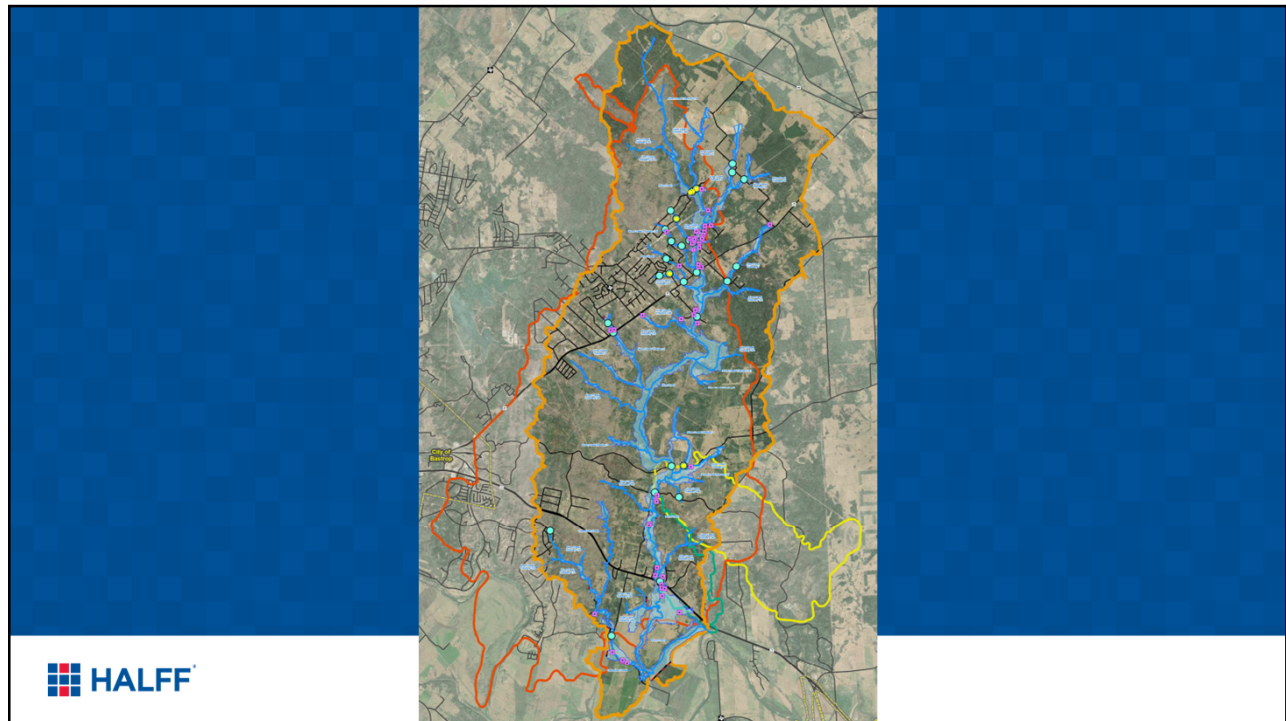
- Extents of Floodplain 100-year for Limited Detail study
- Width of Floodplain

3. CROSSINGS/CONSTRICTIONS

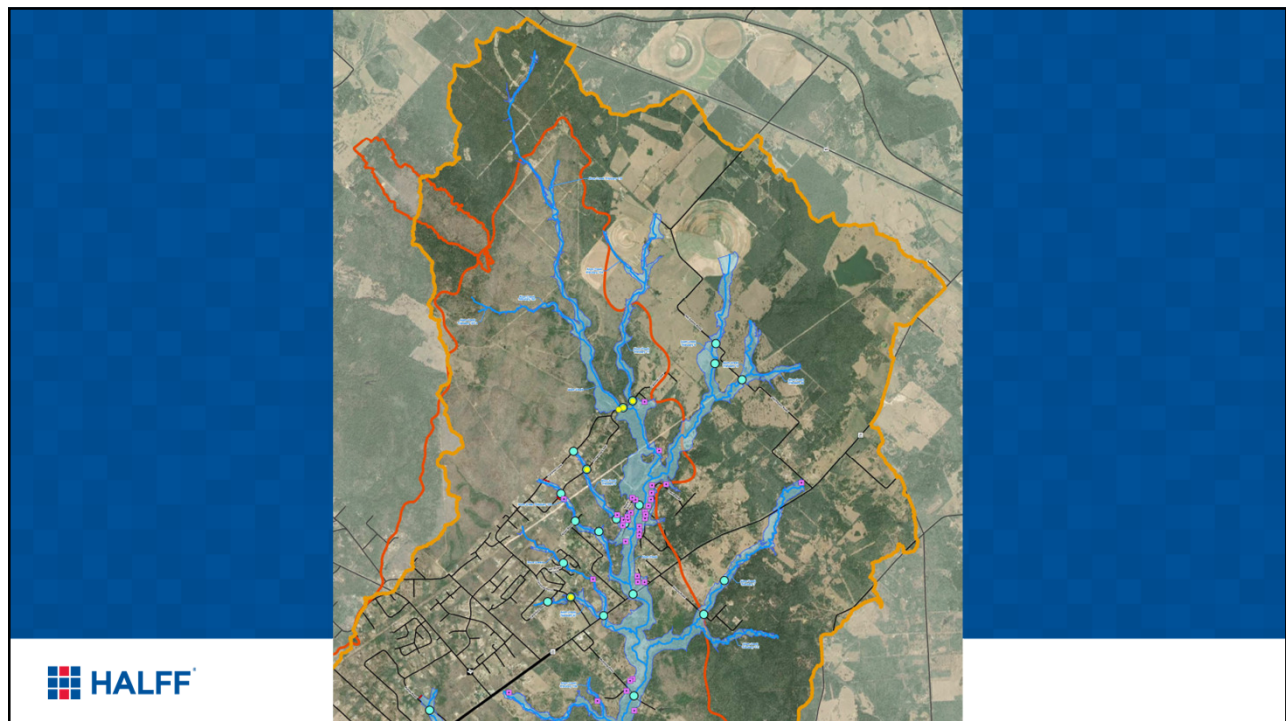
- Overtopping Road Crossings



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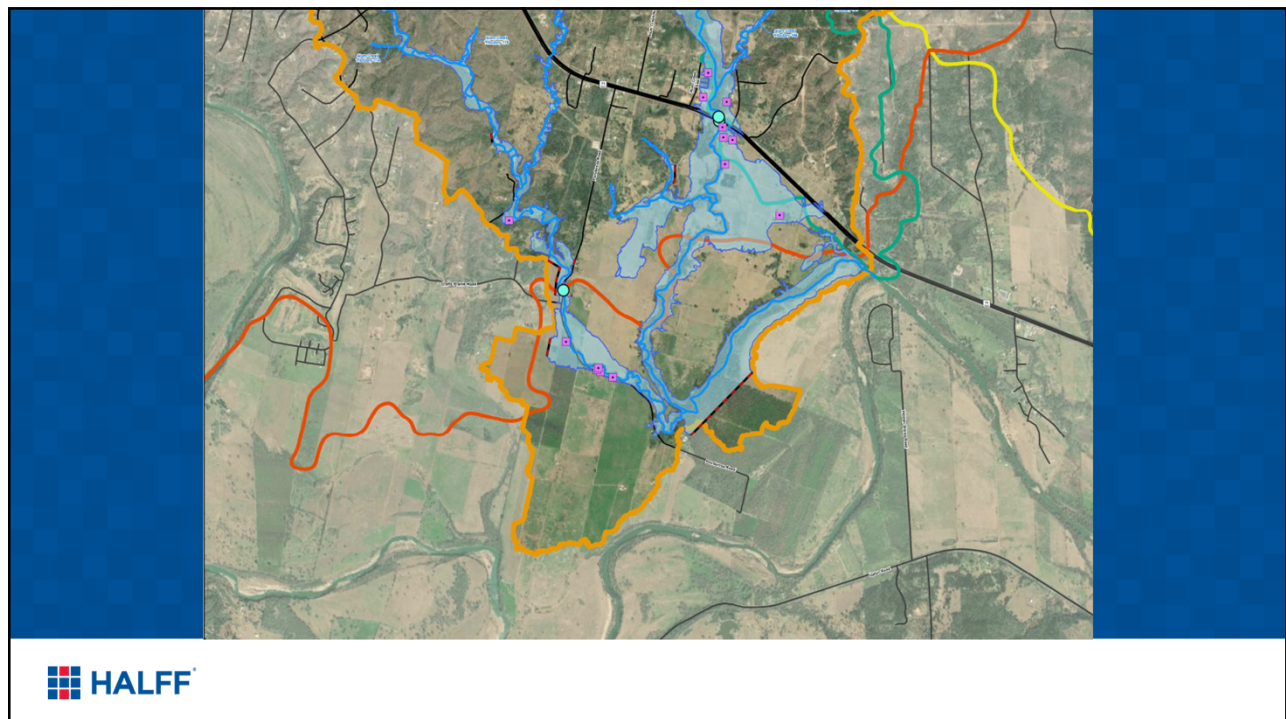
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CONCEPTUAL FLOOD MITIGATION ALTERNATIVES



REGIONAL DETENTION POND



CREEK CROSSING IMPROVEMENTS



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CULVERT IMPROVEMENTS

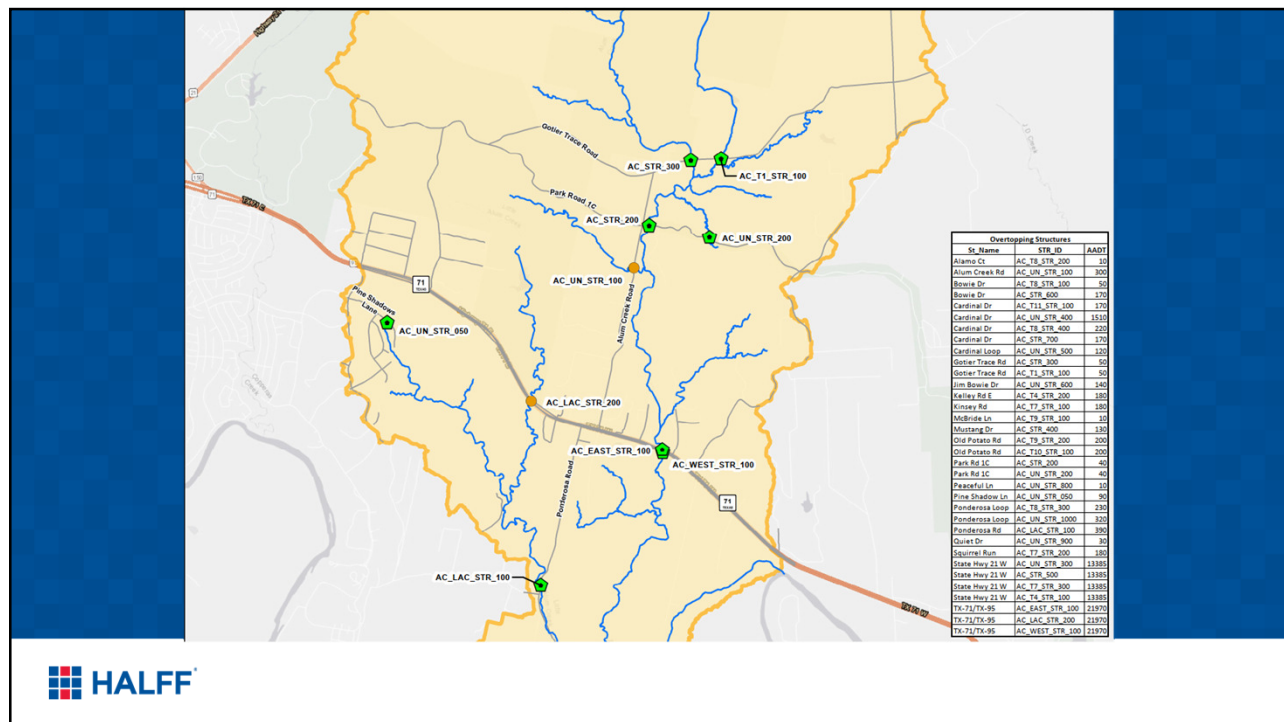


BOWIE DRIVE IN SMITHVILLE



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Road Crossing	Structure ID [Lat., Long.]	Existing Conditions	
		Existing Culvert	Overtopping Event (ACE)
Alum Creek Cardinal Drive	AC_STR_700 [30.1905, -97.2037] & AC_STR_700_West [30.1903, -97.2044]	2 - 31" x 41" CMPs (west) 1 - 1.25' CMP (east)	50% (2-year)
Alum Creek Tributary 1 Gotter Trace	AC_T1_STR_100 [30.1045, -97.2095]	1 - 2.5' CMP	50% (2-year)
Alum Creek Tributary 11 Cardinal Drive	AC_T11_STR_100 [30.1914, -97.2021]	4 - 4' CMPs	50% (2-year)
Alum Creek Tributary 87 Cardinal Drive	AC_UN_STR_400 [30.1648, -97.2127]	2 - 4' CMPs	50% (2-year)
Alum Creek Tributary 8 Ponderosa Loop	AC_T8_STR_300 [30.1822, -97.2096]	3 - 4' CMPs	50% (2-year)

SELECTED ROADWAY IMPROVEMENTS

- Top 5 County roads were selected
- Based on urgency risk rating, repetitive damage, housing density, availability of alternative ingress and egress and immediate needs.
- Existing conditions culverts are overtopped during the 50% ACE storm

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Road Crossing	Proposed Improvement			Probable Cost Estimate
	Culvert Improvement	Roadway Improvement	Overtopping Event (ACE)	
Alum Creek Cardinal Drive	2 - 4' x 3' RCBs (west) 4 - 4' x 2' RCBs (east)	310 LF of Raised Roadway	10% (10-year)	\$545,000
Alum Creek Tributary 1 Gotier Trace	2 - 12' x 6' RCBs	300 LF of Raised Roadway 460 LF Channel Improvement	50% (2-year)	\$533,900
Alum Creek Tributary 11 Cardinal Drive	5 - 7' x 6' RCBs	360 LF of Raised Roadway	4% (25-year)	\$719,200
Alum Creek Tributary 87 Cardinal Drive	3 - 8' x 6' RCBs	100 LF of Raised Roadway	0.2% (500-year)	\$351,900
Alum Creek Tributary 8 Ponderosa Loop	3 - 8' x 5' RCBs	192 LF of Raised Roadway	4% (25-year)	\$430,900


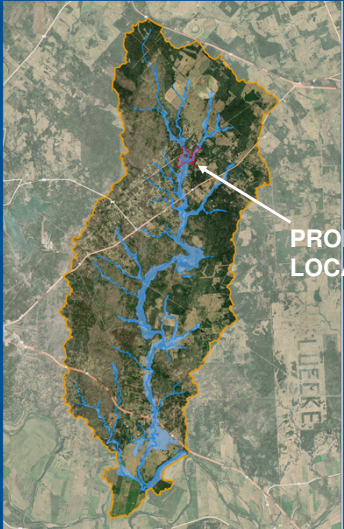
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PROPOSED ROADWAY IMPROVEMENTS

- Goal was to reduce flood overtopping as much as possible
- Roadways were raised 1 foot max to allow for larger culverts

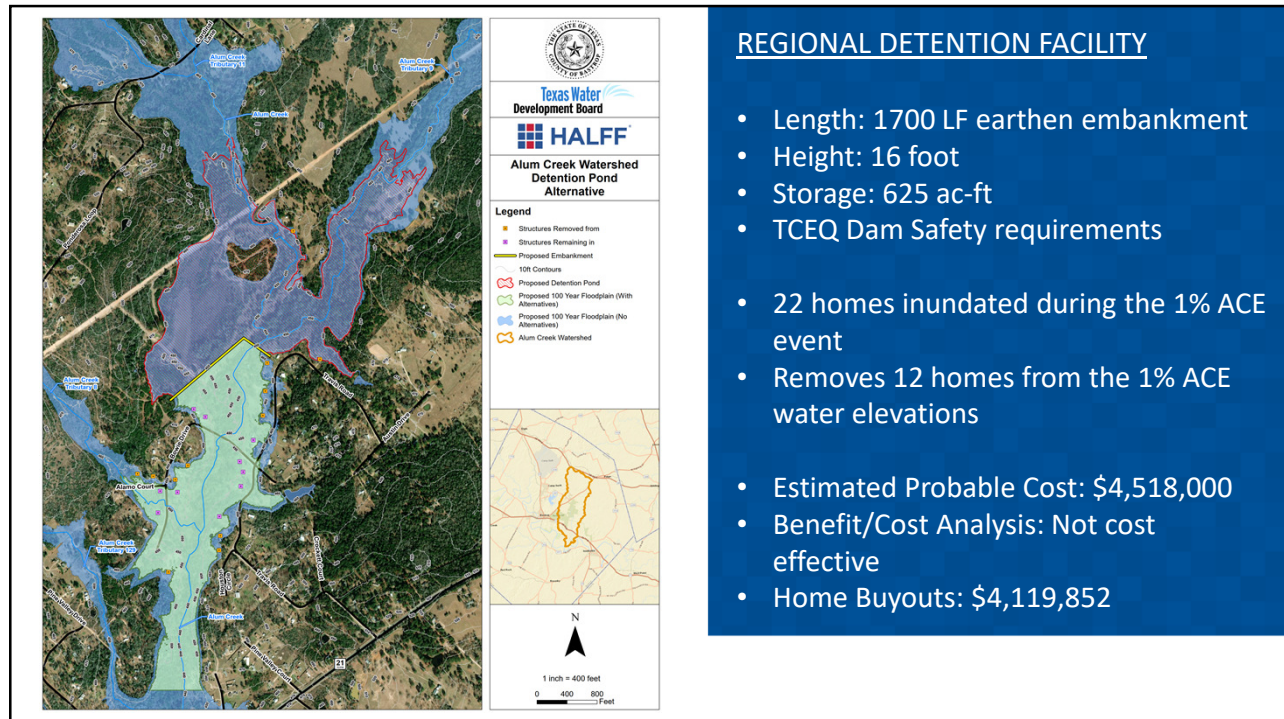
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REGIONAL DETENTION POND

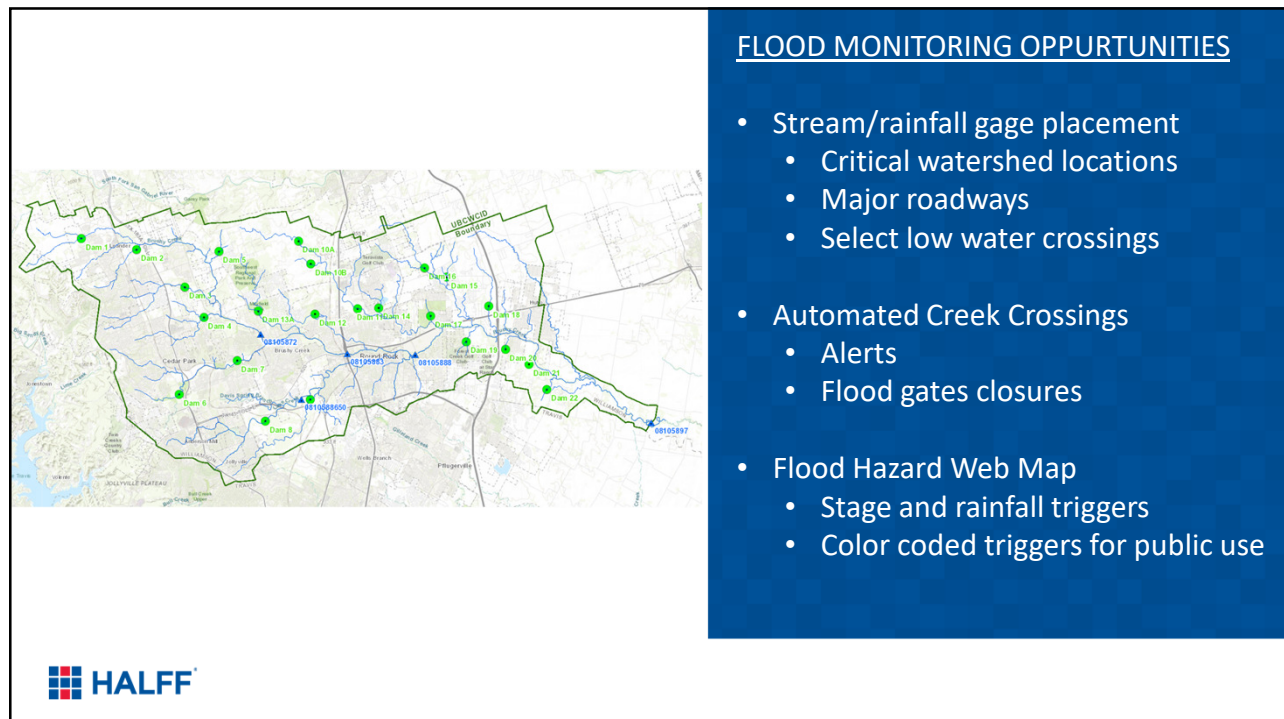



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ALUM CREEK WATERSHED STUDY NEXT STEPS



- Pre-Disaster Mitigation (PDM) Grant
- Hazard Mitigation Grant Program (HGMP)
- Flood Mitigation Assistance (FMA) Grant
- GLO CDBG Mitigation Program (GLO CDBG-MIT)
- TWDB Flood Infrastructure Fund (FIF)
- Clean Water State Revolving Fund (CWSRF) Loan
- Building Resilient Infrastructure and Communities (BRIC)



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BASTROP COUNTY TWDB FLOOD PROTECTION PLANNING STUDY ALUM CREEK

QUESTIONS?

THANK YOU FOR YOUR TIME



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