



# Travis County Flood Mitigation Study

## October 2015 Flood Event and Mitigation Study



*November 10, 2016*



# Study Purpose

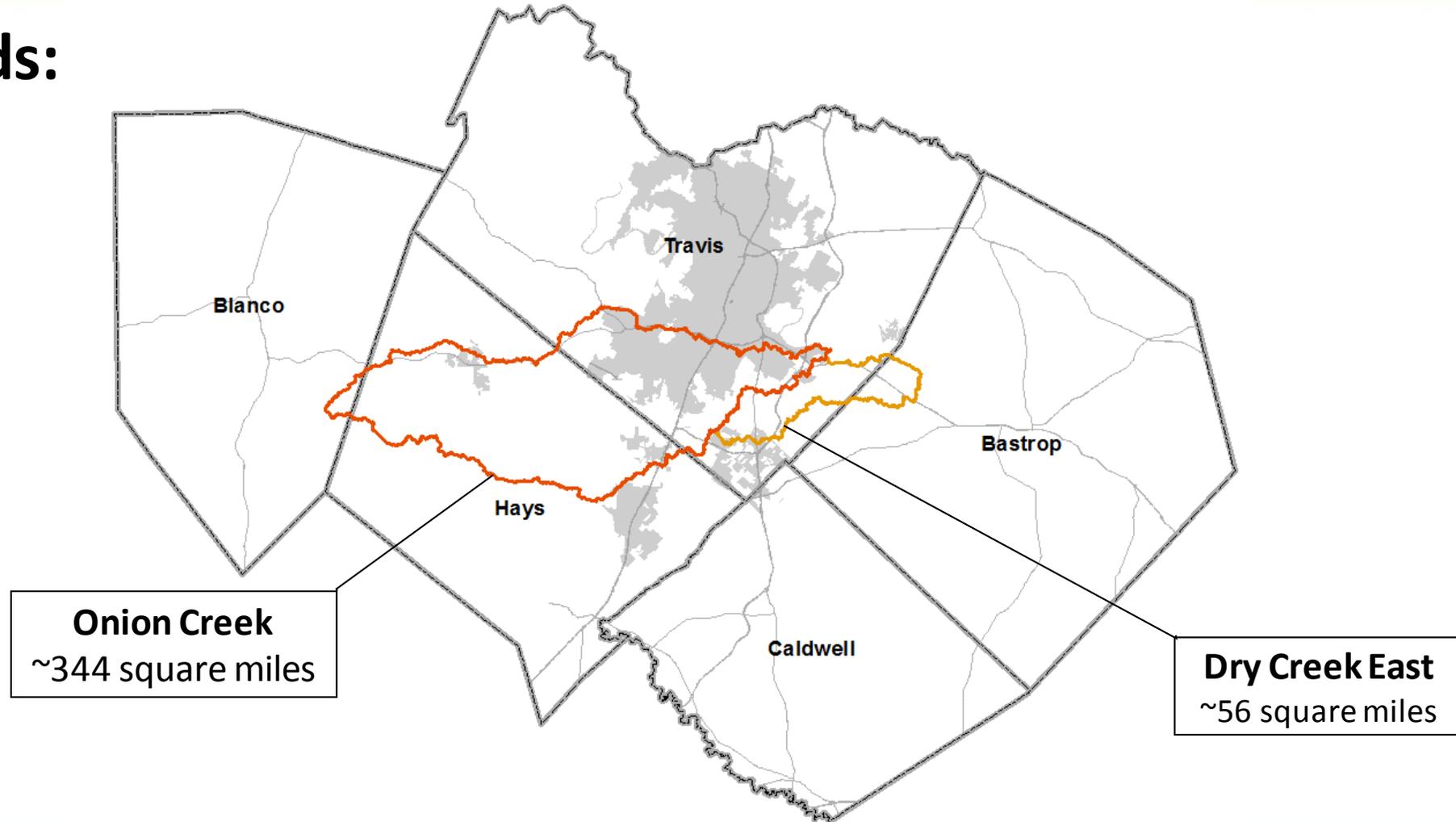
Travis County is conducting a comprehensive study of recent flood events to:

- Better understand what happened
- Plan for the future
- Explore flood mitigation options



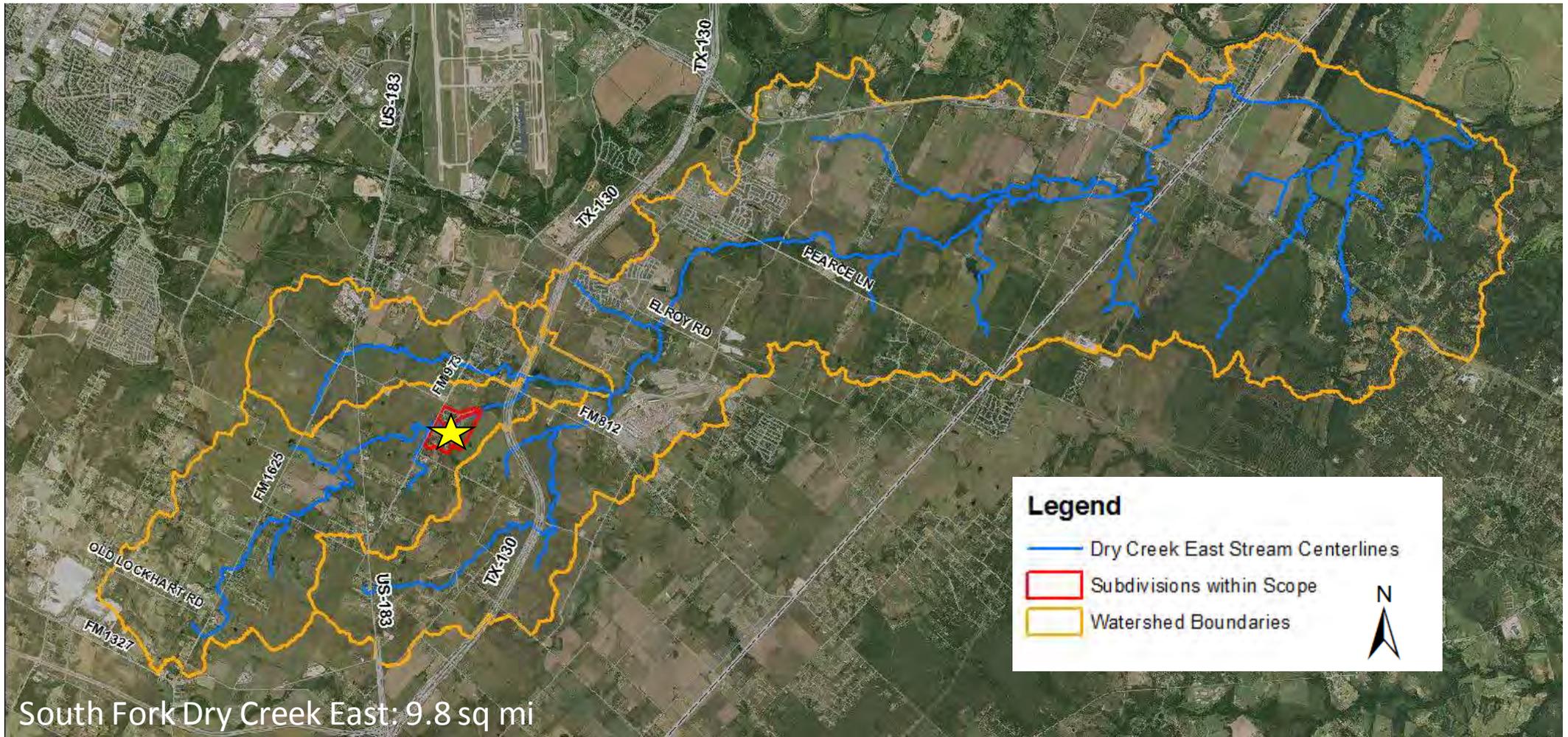
# Project Limits – Study Areas

## Watersheds:



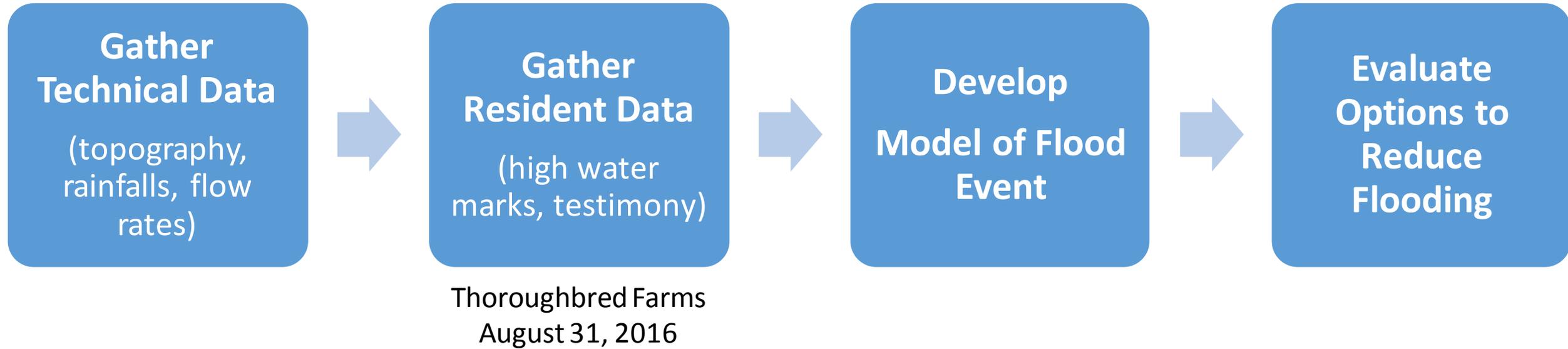


# Project Study Area - Dry Creek East





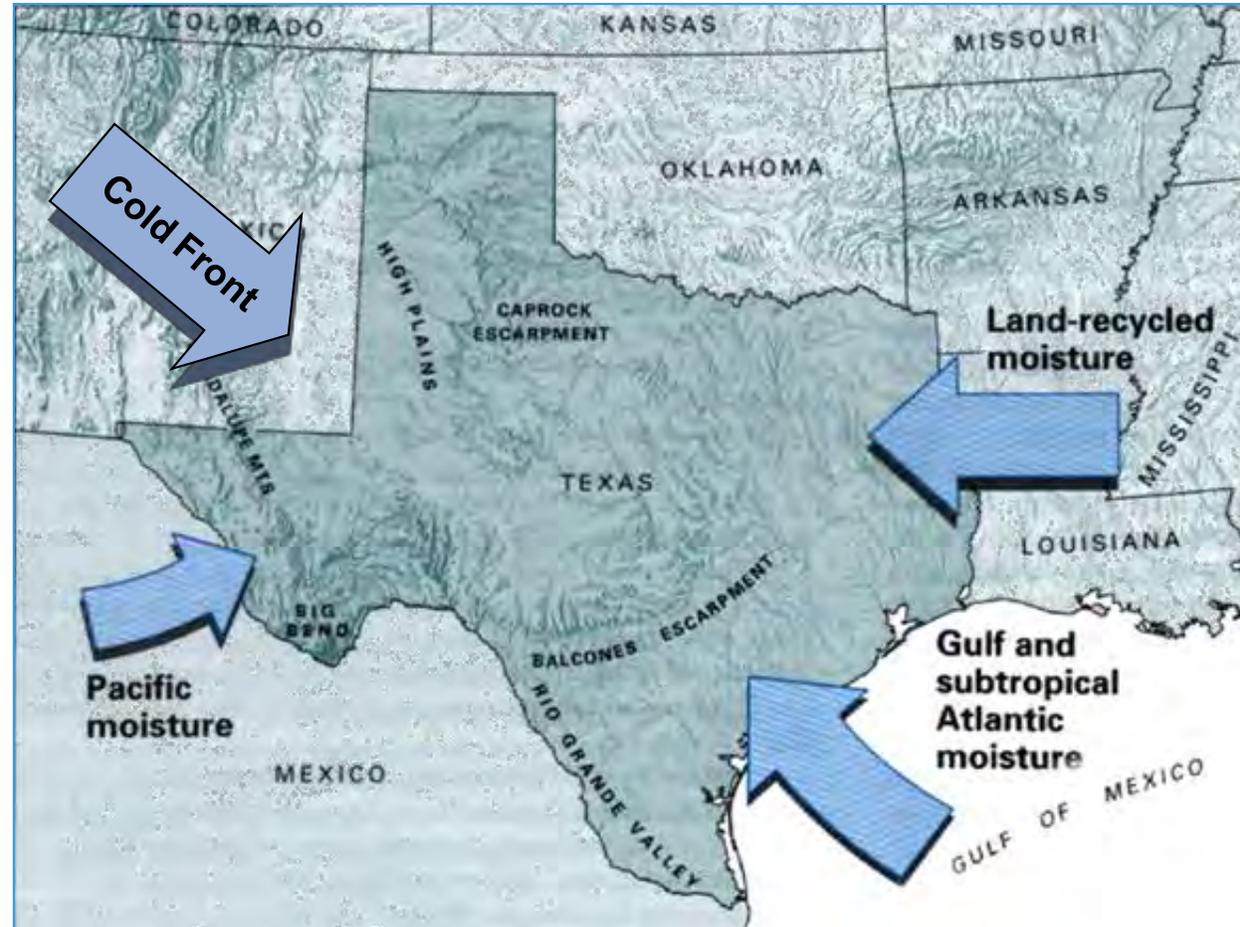
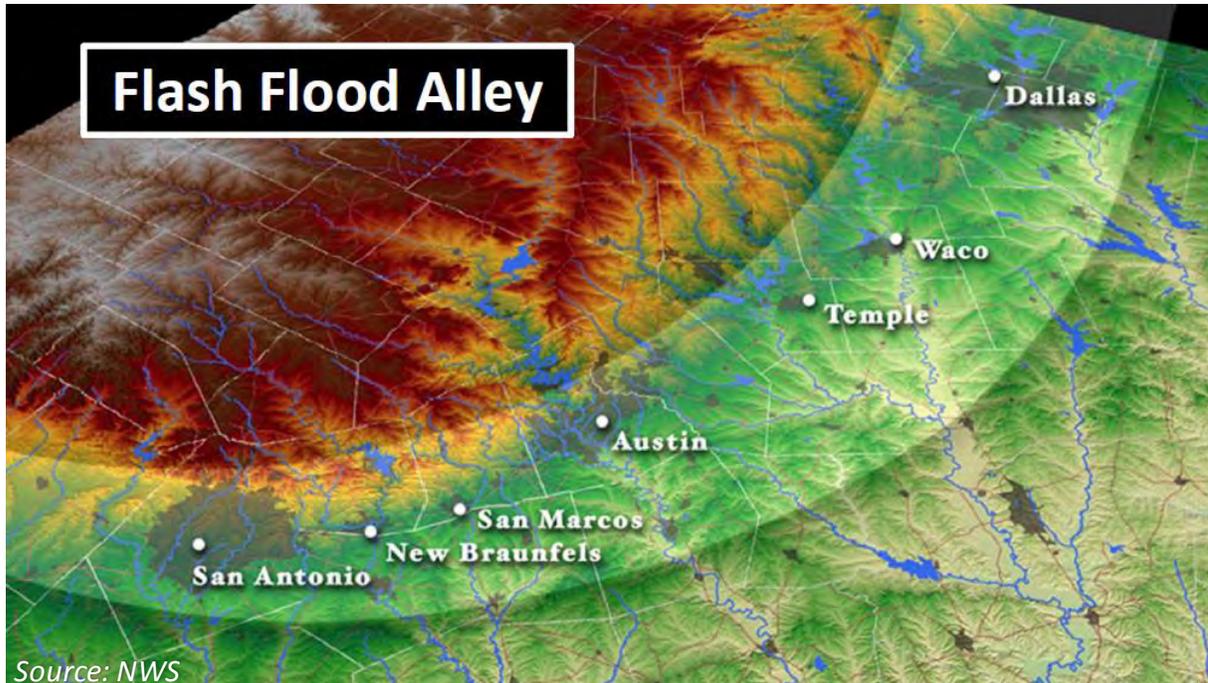
# How is the study conducted?





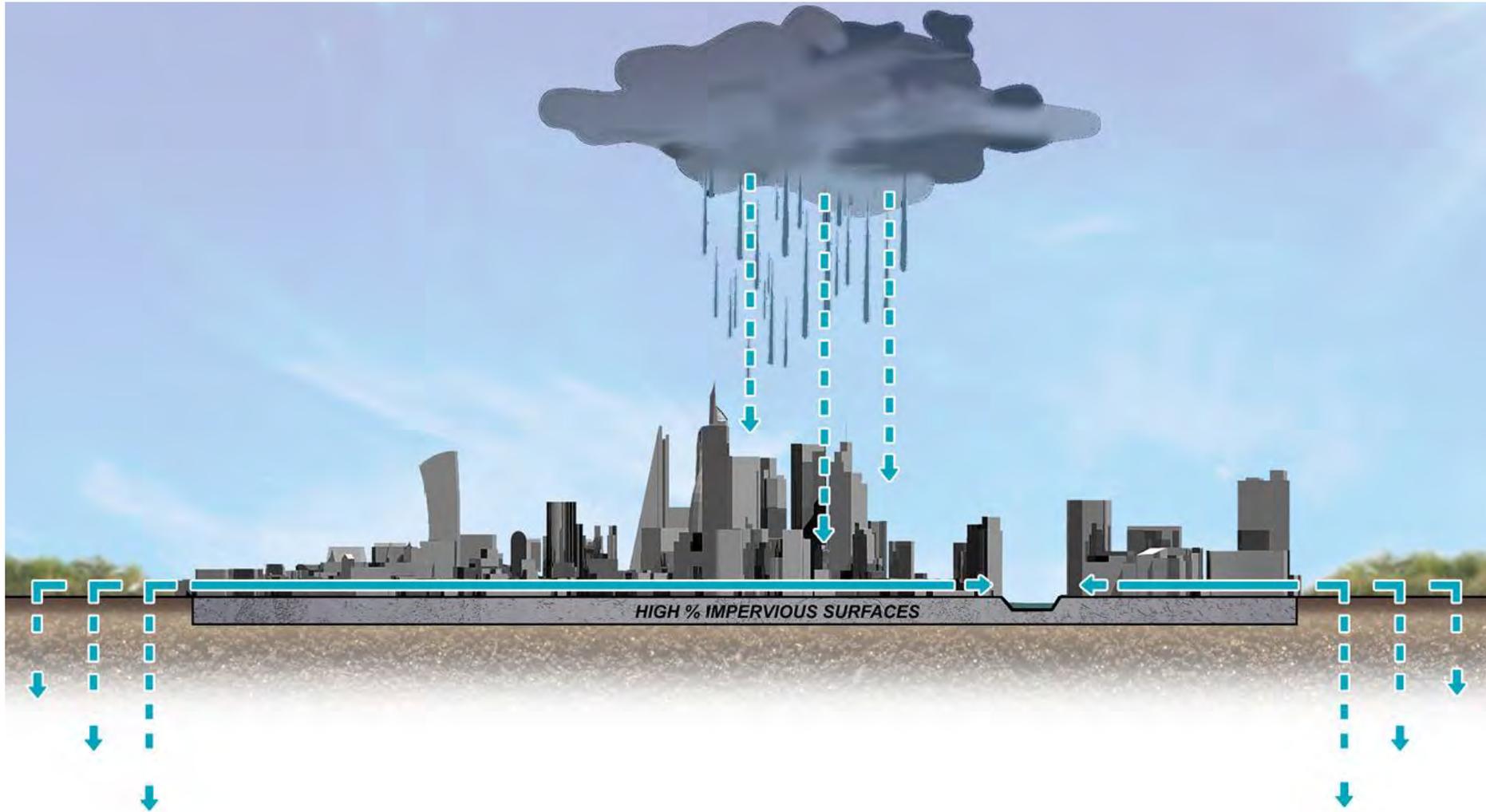
# Factors for Flash Flooding

- Steep Terrain
- Shallow Soil
- High Rain Fall Rates





# Hydrologic Cycle

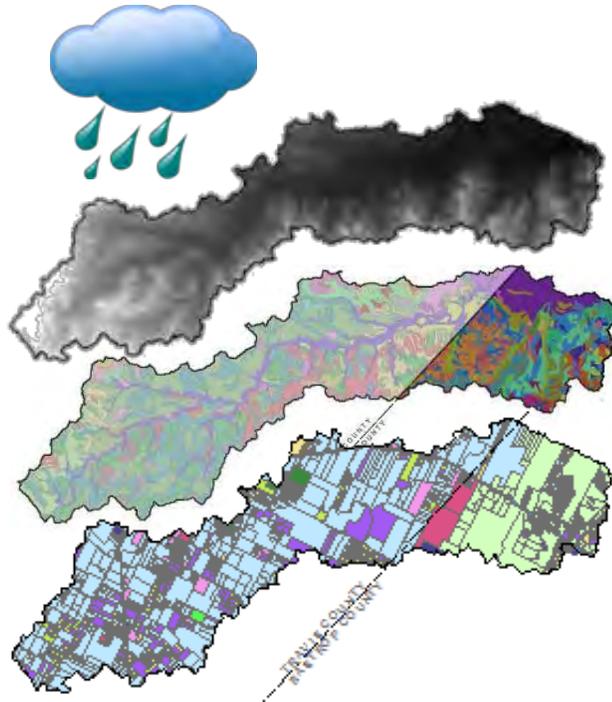




# Floodplain Management Overview

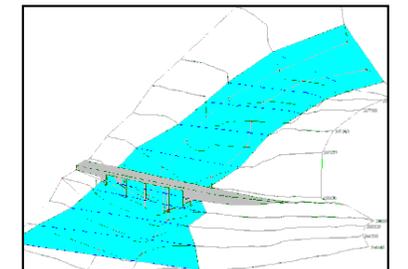
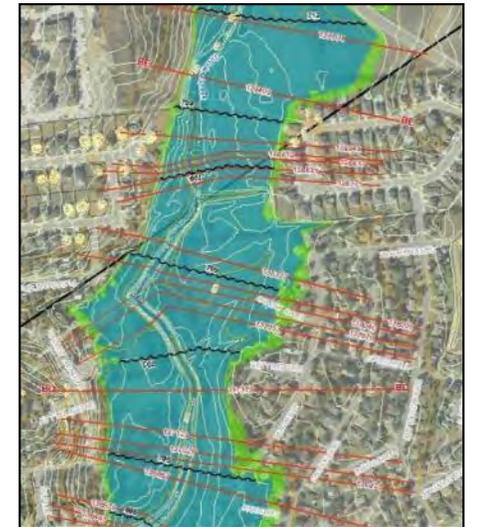
- **Hydrology** – Water movement to creek

- Rainfall
- Topography
- Soils
- Land Use



- **Hydraulics** – Water movement in creek

- Hydrology
- Topography
- Cross-Sections
- Creek Crossings





# Probability of Flooding

Flood Events	Probability of Occurrence in ANY given year	Percent Chance of Occurrence in ANY given year
500 Year	1 in 500	0.2 %
100 Year	1 in 100	1 %
50 Year	1 in 50	2 %
10 Year	1 in 10	10 %



# Dry Creek East EXTREME Weather Events

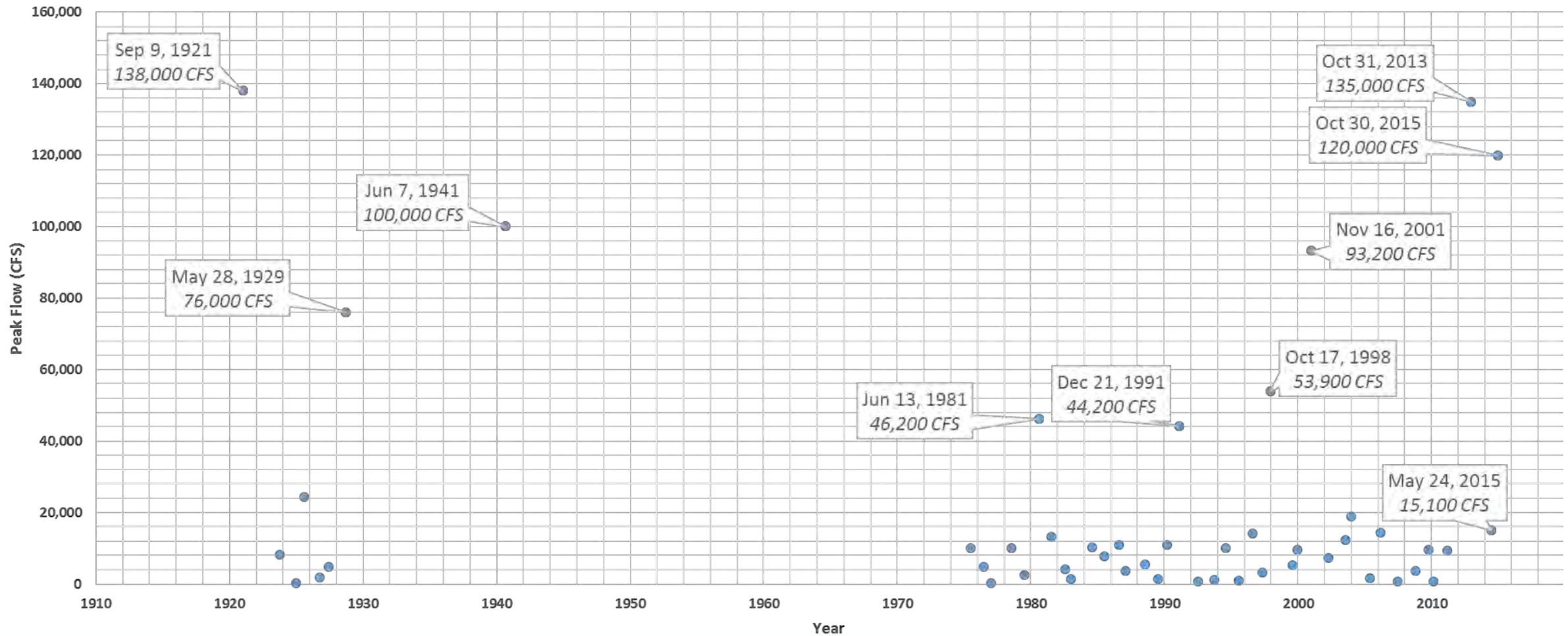
	Flow (cubic feet per second)			
	1% ACE	0.2% ACE	Oct 30, 2015	May 26, 2016
South Fork of Dry Creek East at Thoroughbred Farms	11,800 cfs	16,200 cfs	18,000 cfs*	16,200 cfs*

	Rainfall (inches)			
	1% ACE	0.2% ACE	Oct 30, 2015	May 26, 2016
South Fork of Dry Creek East at Thoroughbred Farms	6.5 (4 hr)	9.0 (4 hr)	11-14 (2 hr)	8-11 (4 hr)

\*Preliminary Data from models



# USGS Gage 08159000: Onion Creek at US-183



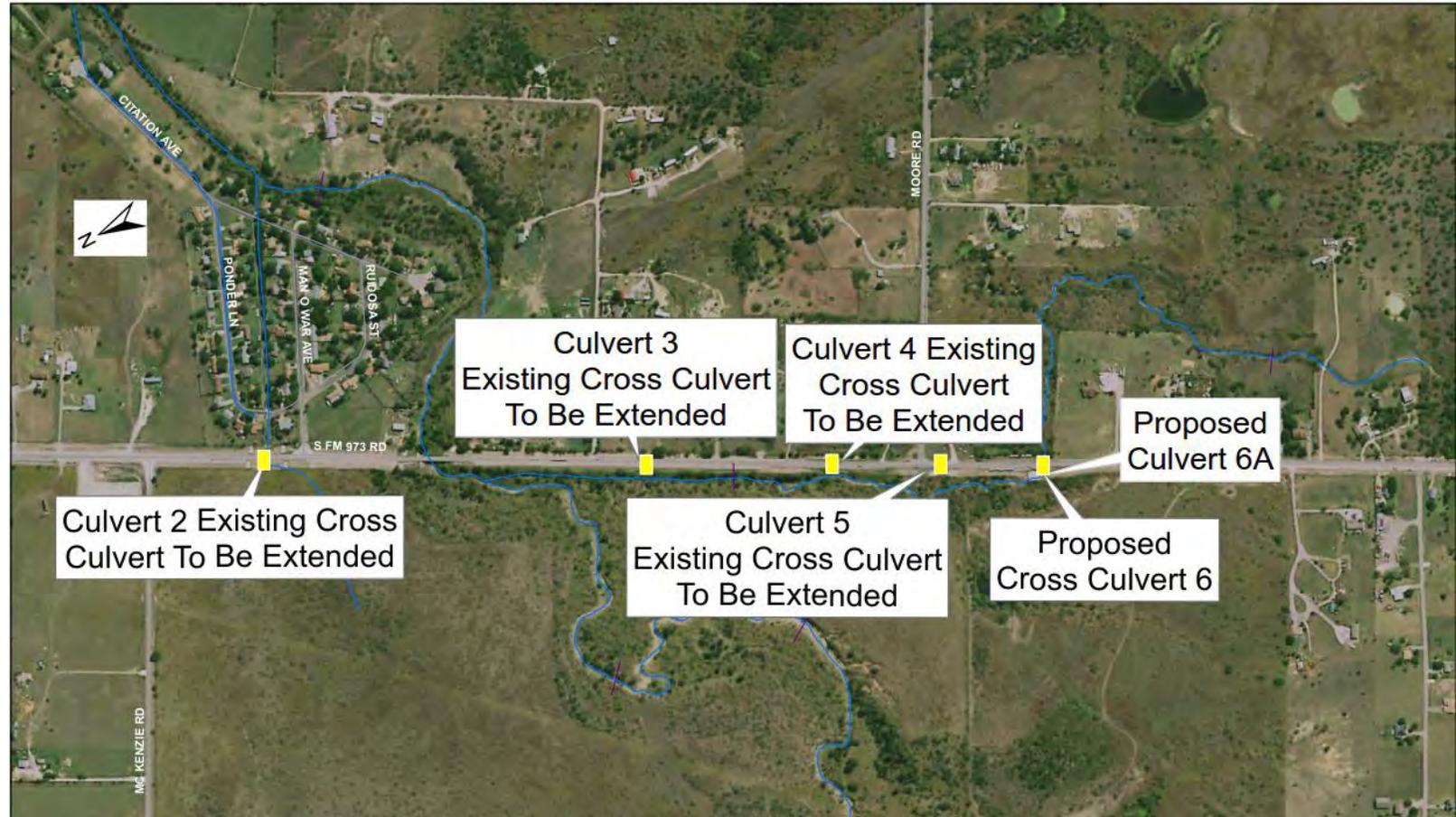






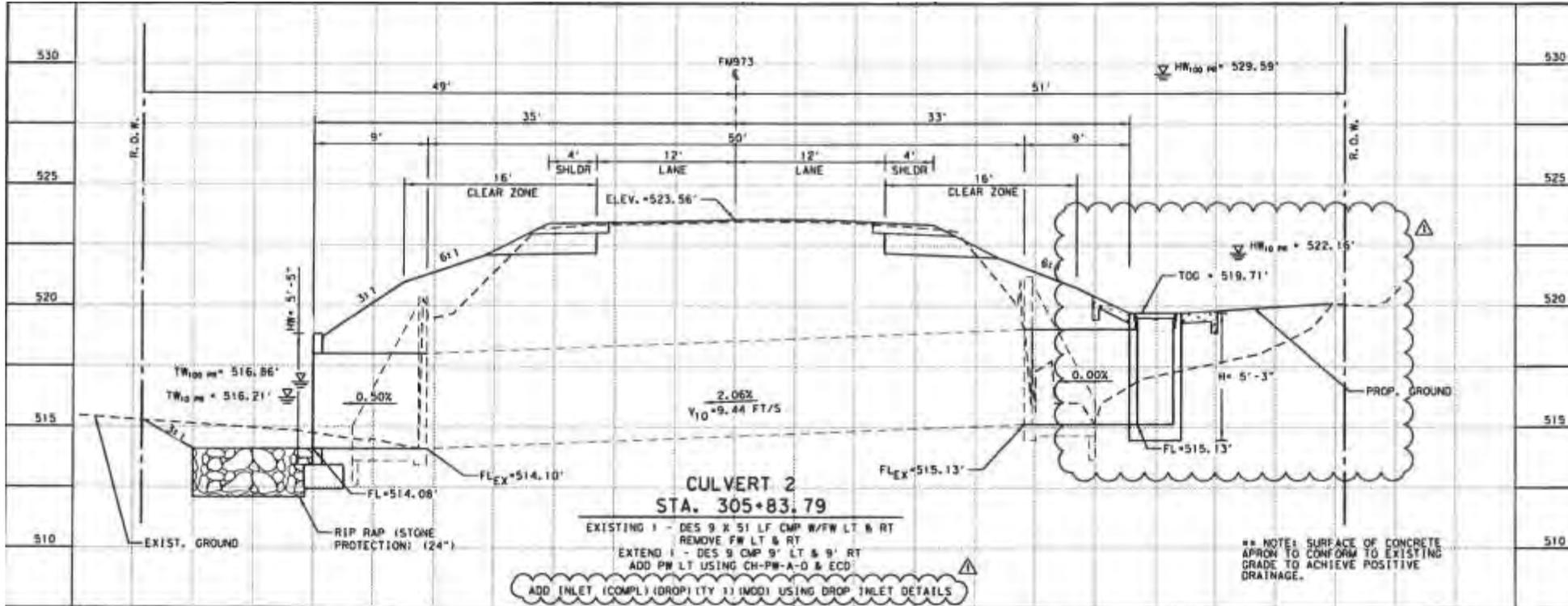
# TxDOT FM 973 Improvements of Interests

- 5 Areas of Interests
  - 4 Culverts Extended
  - 1 Replacement





# Culvert 2



FM 973  
CULVERT LAYOUT  
CULVERT 2

STA. 305+83.79

SHEET 10F 1

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	AUS	TRAVIS	110
CON.	SECT.	JOB	HIGHWAY NO.
1200	05	016	FM 973



# TxDOT Culvert 2 Upstream Views

**Original**



**Improvements**





# TxDOT Culvert 2 Downstream

**Original**

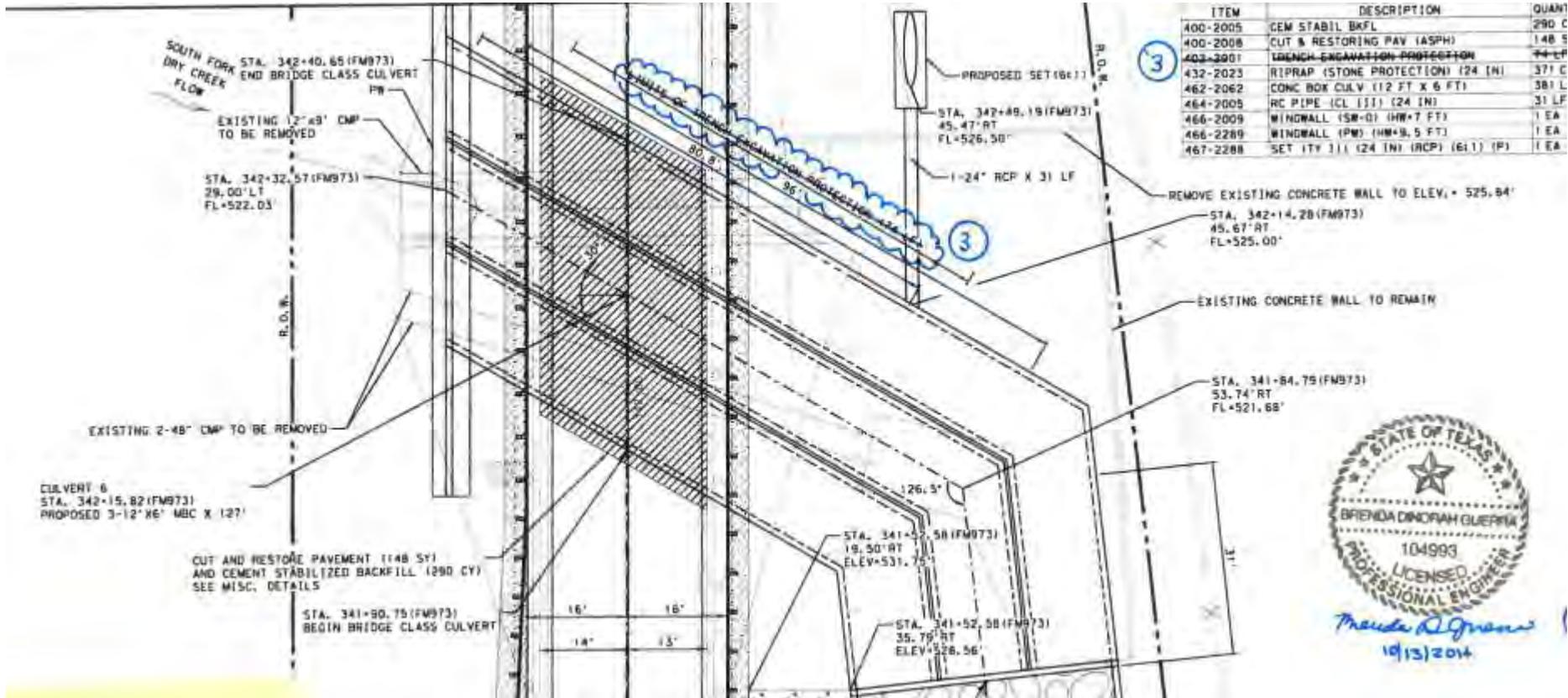


**Improvements**





# Culvert 6 & 6A



ITEM	DESCRIPTION	QUANT
400-2005	CEM STABIL BKFL	290 C
400-2008	CUT & RESTORING PAV (ASPH)	148 S
403-3001	TRENCH ENCAVATION PROTECTION	94 LF
432-2023	RIPRAP (STONE PROTECTION) (24 IN)	371 C
462-2062	CONC BOX CULV (12 FT X 6 FT)	381 L
464-2005	RC PIPE (CL (1)) (24 IN)	31 LF
466-2009	WINDMALL (SR-D) (HW=7 FT)	1 EA
466-2289	WINDMALL (PW) (HW=9.5 FT)	1 EA
467-2288	SET (TY 31) (24 IN) (RCP) (611) (P)	1 EA

HYDRAULIC DATA			
UPSTREAM		DOWNSTREAM	
Q <sub>up</sub>	1290 cfs	Q <sub>dn</sub>	1290 cfs
V <sub>up</sub>	8.54 fps	V <sub>dn</sub>	7.67 fps
WSEL <sub>up</sub>	527.92 ft	WSEL <sub>dn</sub>	526.17 ft
Q <sub>cr</sub>	2780 cfs	Q <sub>crp</sub>	2760 cfs
V <sub>cr</sub>	8.87 fps	V <sub>crp</sub>	8.13 fps
WSEL <sub>cr</sub>	528.96 ft	WSEL <sub>crp</sub>	526.98 ft



*Brenda Dinorah Guerra*  
10/13/2014

FM 973  
CULVERT LAYOUT  
CULVERT 6

STA. 342+15.82

SHEET 1 OF 2

PROJECT NO.	113
STATE	TEXAS
COUNTY	AUS
PROJECT NO.	016
PROJECT NAME	FM 973



# TxDOT Culvert 6 & 6A Downstream

**Original**



**Improvements**

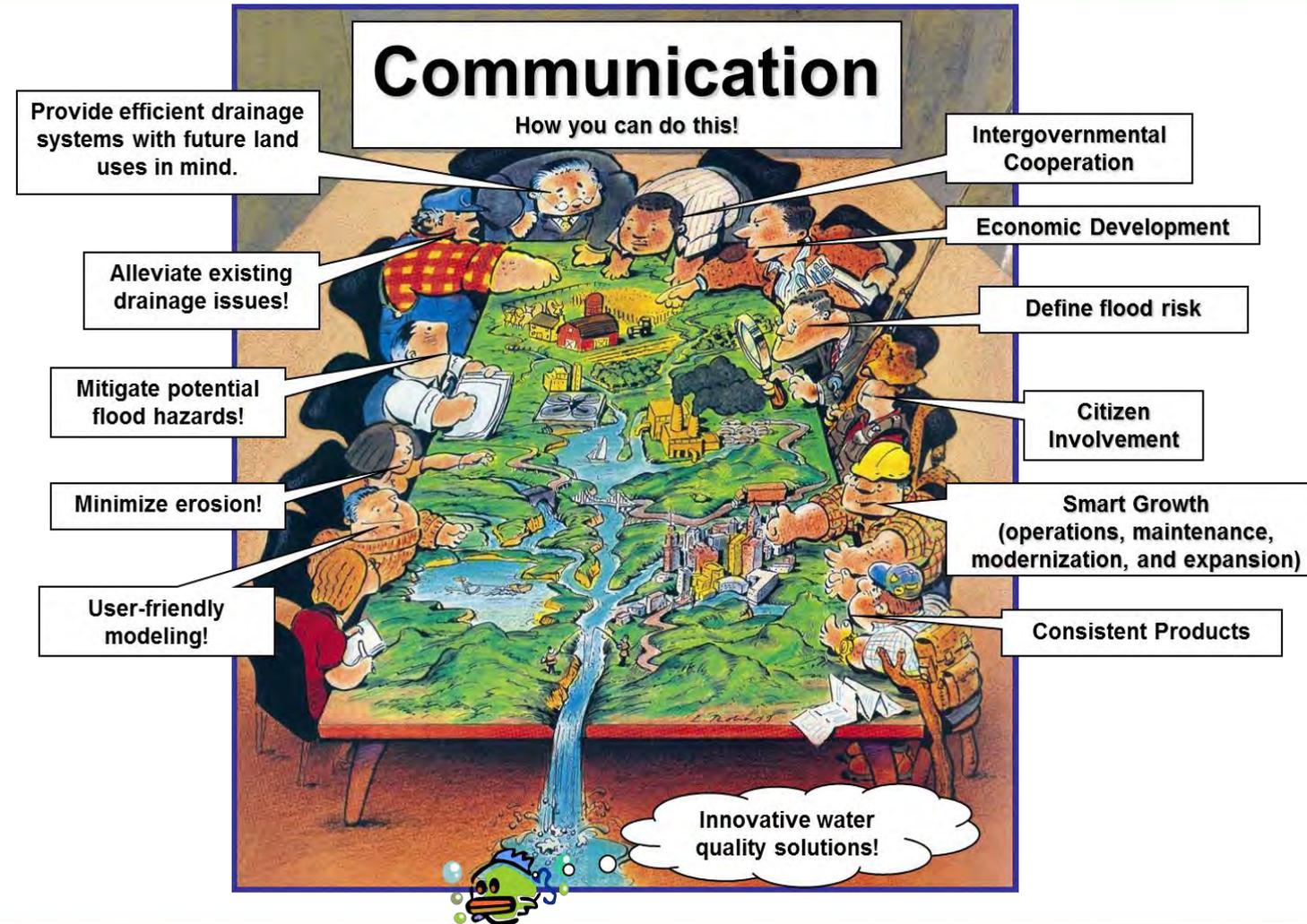




# Flood Mitigation Analysis

## Conceptual Analysis

- Stakeholder Coordination
- Funding Sources
- Permitting Considerations





# Flood Mitigation Alternatives

- Structural

- Channel Clearing
- Channel benching
- Floodwall
- Detention



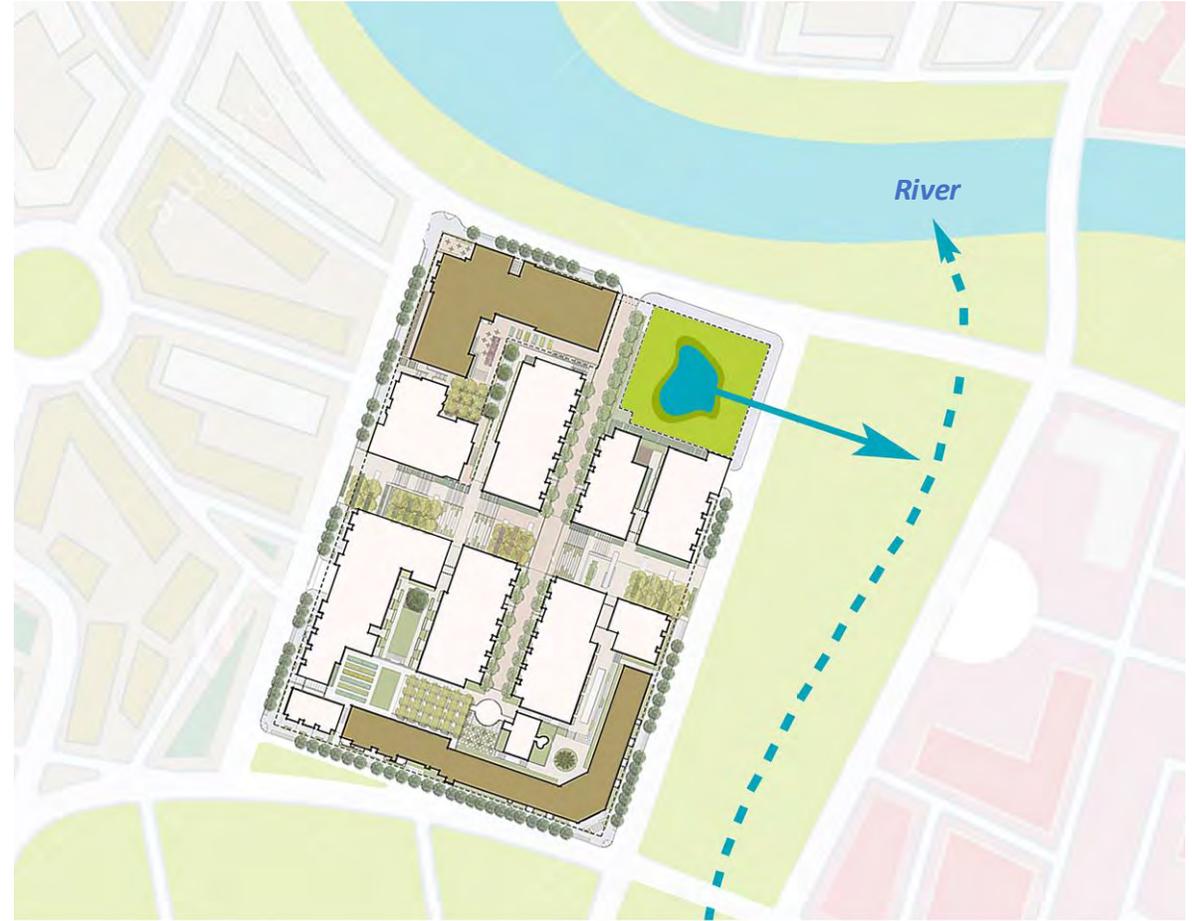
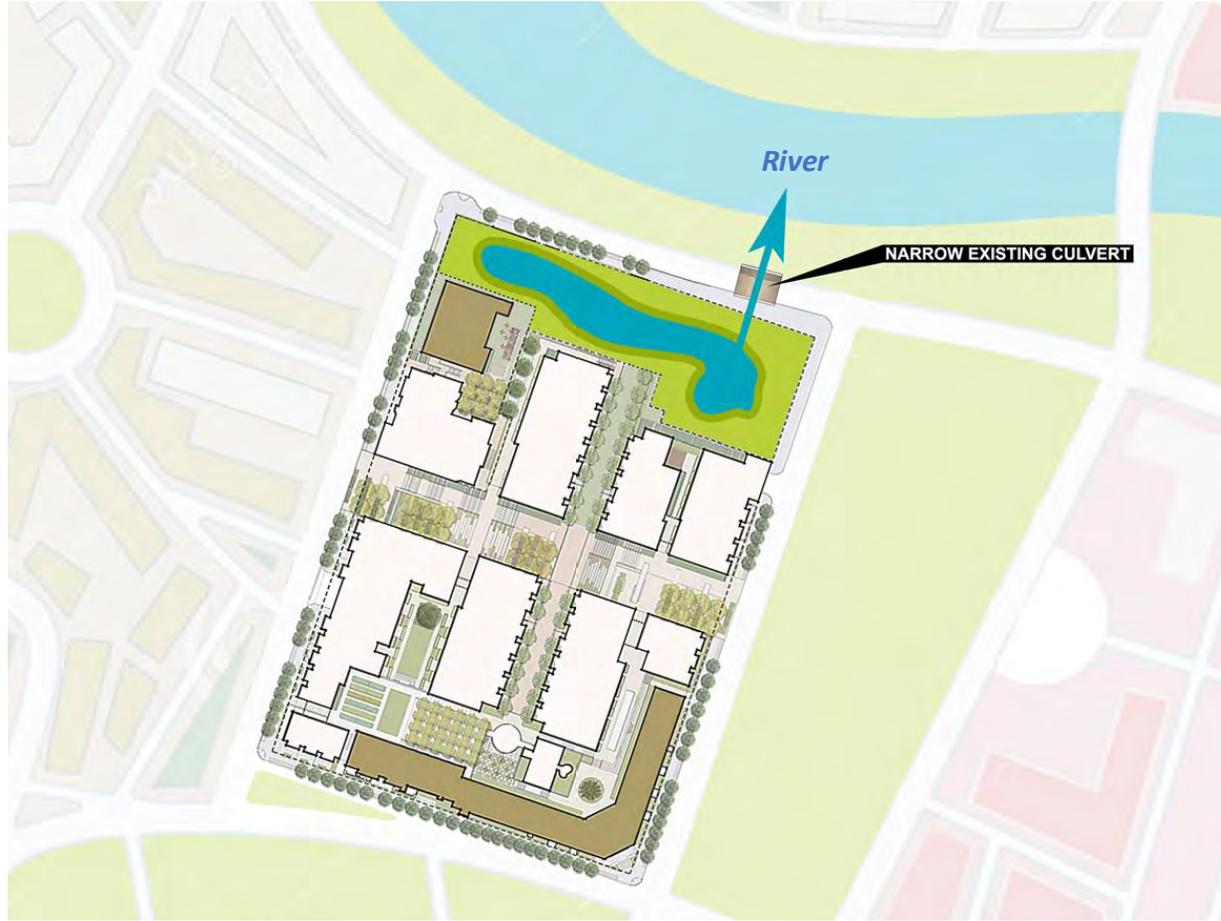
- Non-Structural

- Property Acquisition
- Regulation Changes
- Flood Awareness Outreach



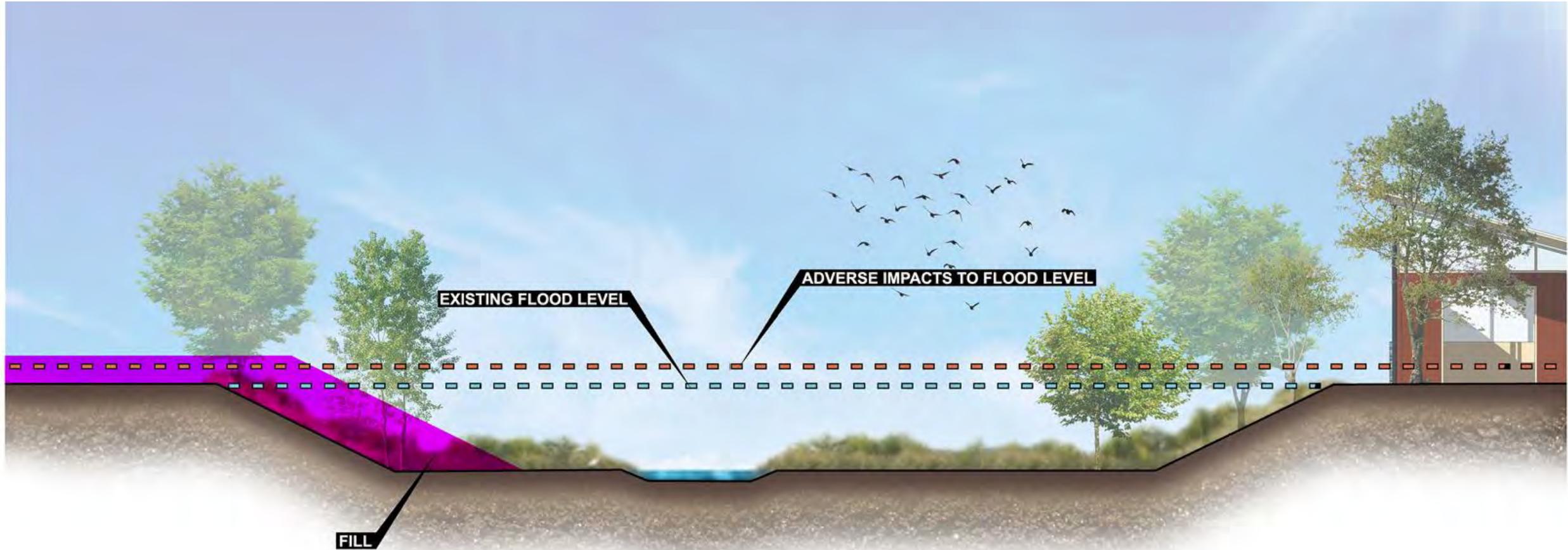


# Detention



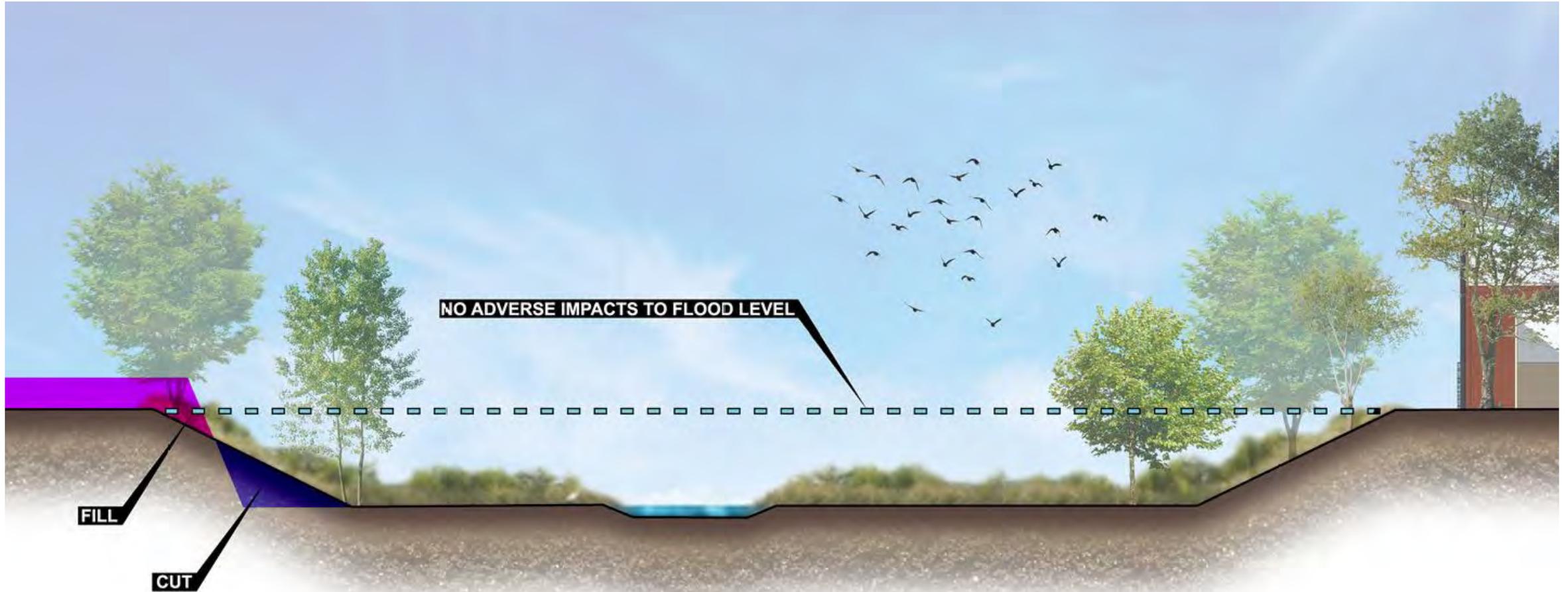


# Channel Modifications



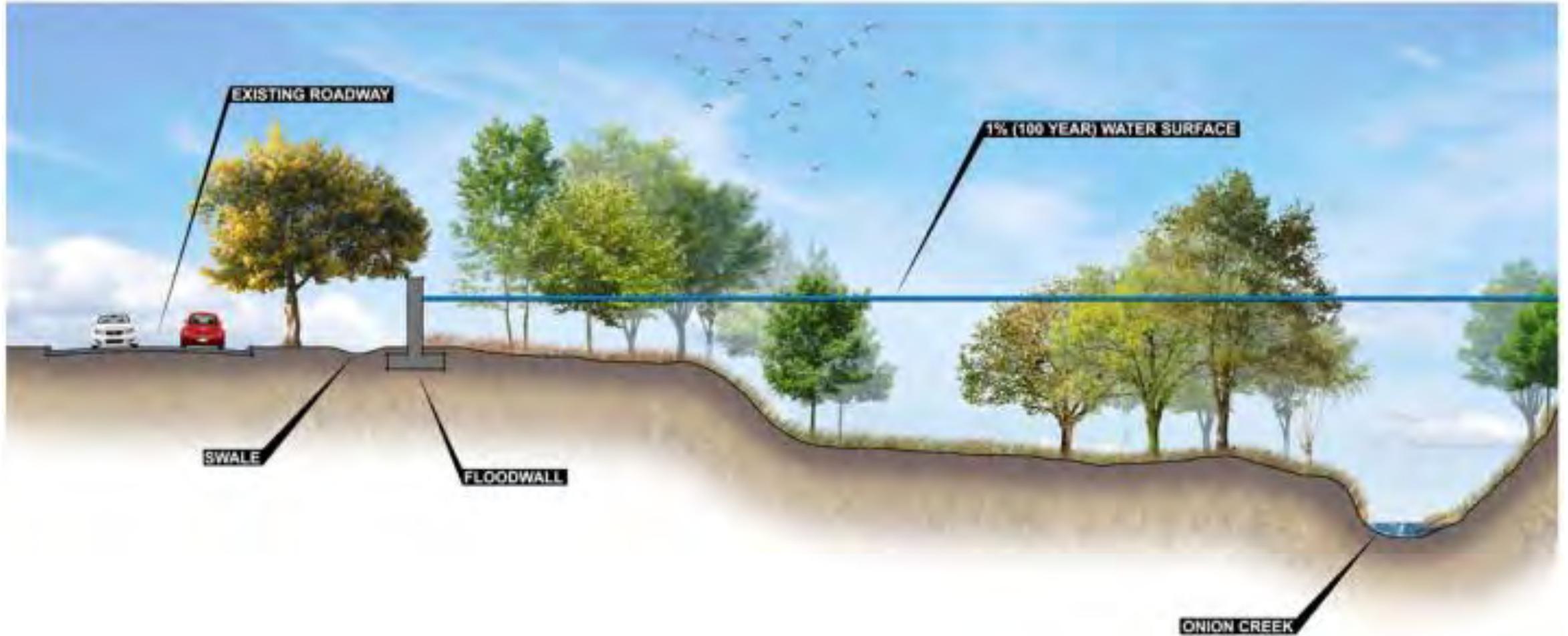


# Channel Modifications





# Floodwall

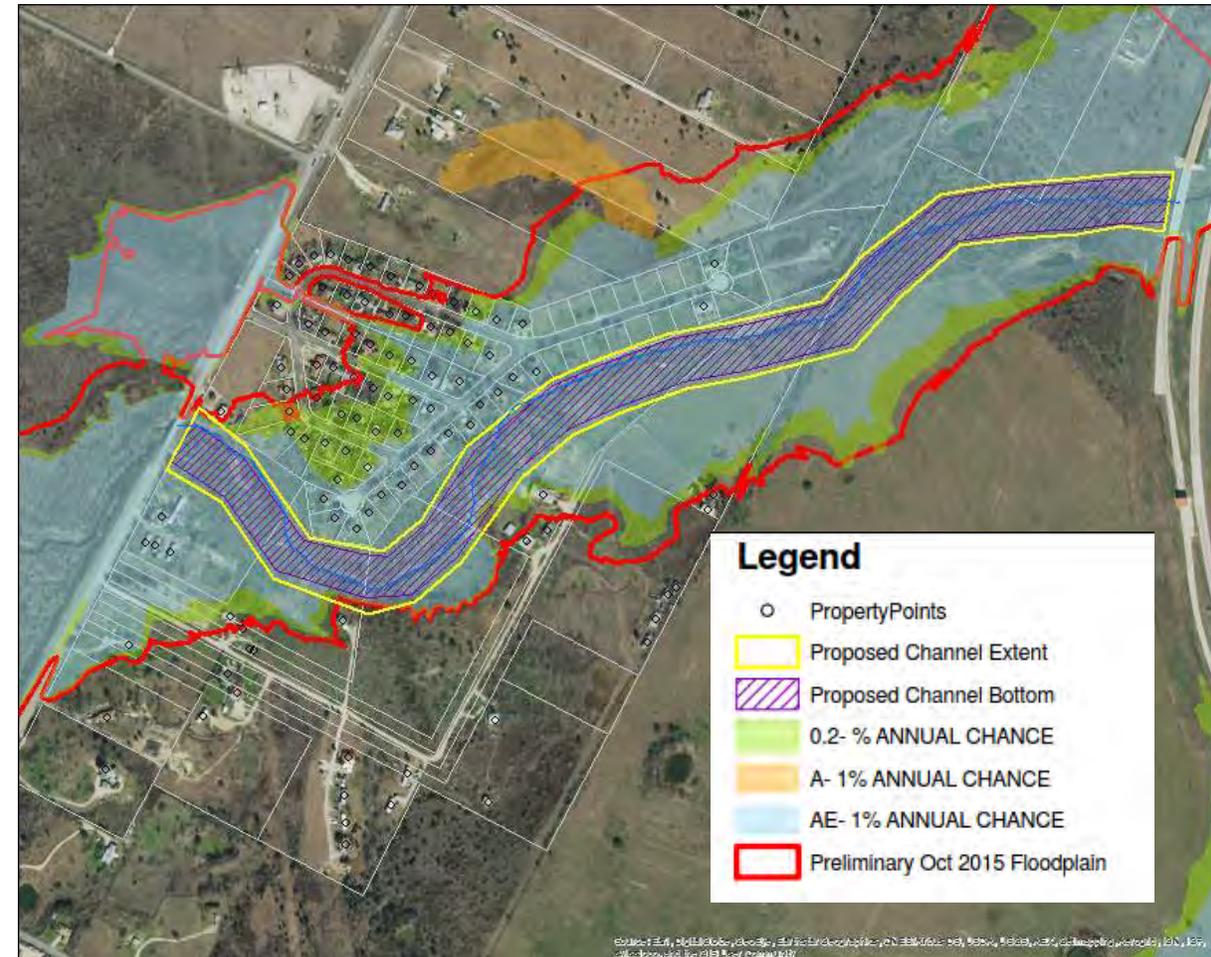




# Dry Creek East Mitigation Alternatives

## Preliminary Analysis

- Property Acquisition within the 1% ACE floodplain
- Potential Storm Drainage Improvements: 2009 TWDB FPP
- Clearing & channel benching  
~200 ft channel bench
- Regional detention  
~1700 ac-ft (takes 1% ACE to 10% ACE)





# Mitigation Challenges

- Recent extreme flooding
- Technical challenges – Hydrology and Hydraulics
- Valuable updates to flood risk data / floodplains
- Anxious residents looking for solutions... quickly



Oct 2015, Dry Creek East, 10602 Man O War Ave.