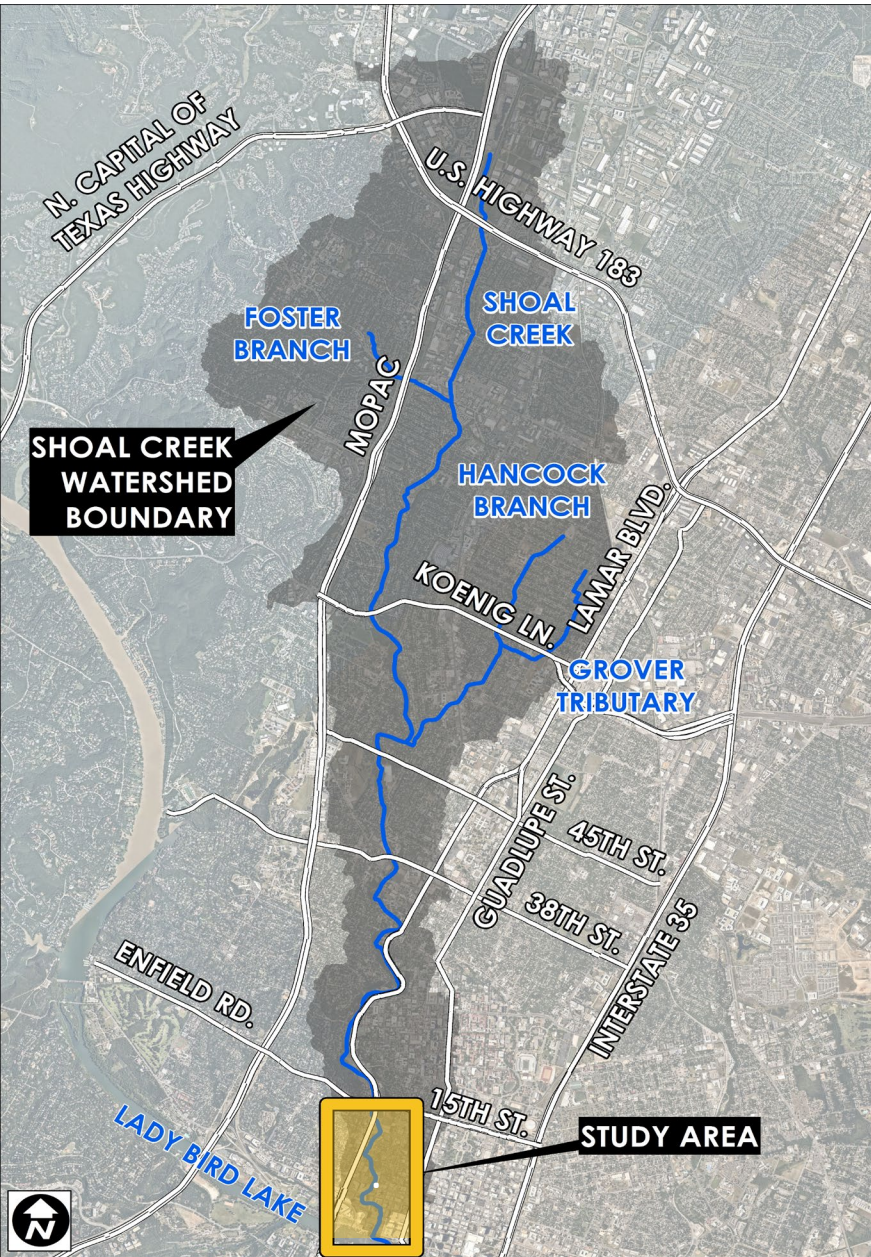


# LOWER SHOAL CREEK FLOOD RISK REDUCTION





## Feasibility Study Overview

- Phase I
  - Data Collection
  - 1<sup>st</sup> Public Meeting – 3/9/2017
- Phase II
  - Feasibility Flood Risk Reduction Analysis
  - 2<sup>nd</sup> Public Meeting – Today
  - Conceptual Cost Estimates
  - Evaluation Criteria
  - Documentation & Recommendation



# BACKGROUND





## History of Flooding

- April 1915
- May 1981
- December 1991
- November 2001
- September 2014
- May 2015



C08541, Austin History Center, Austin Public Library

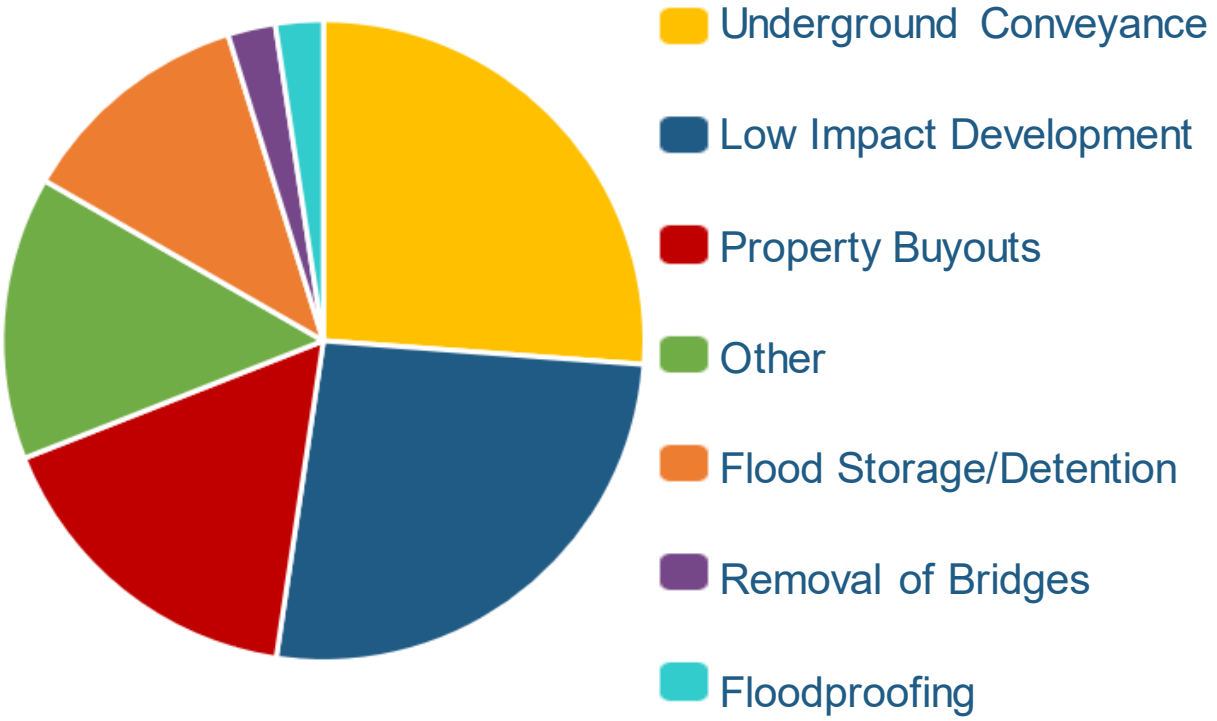


PICA 15139, Austin History Center, Austin Public Library; Photo by Hienz Schultz



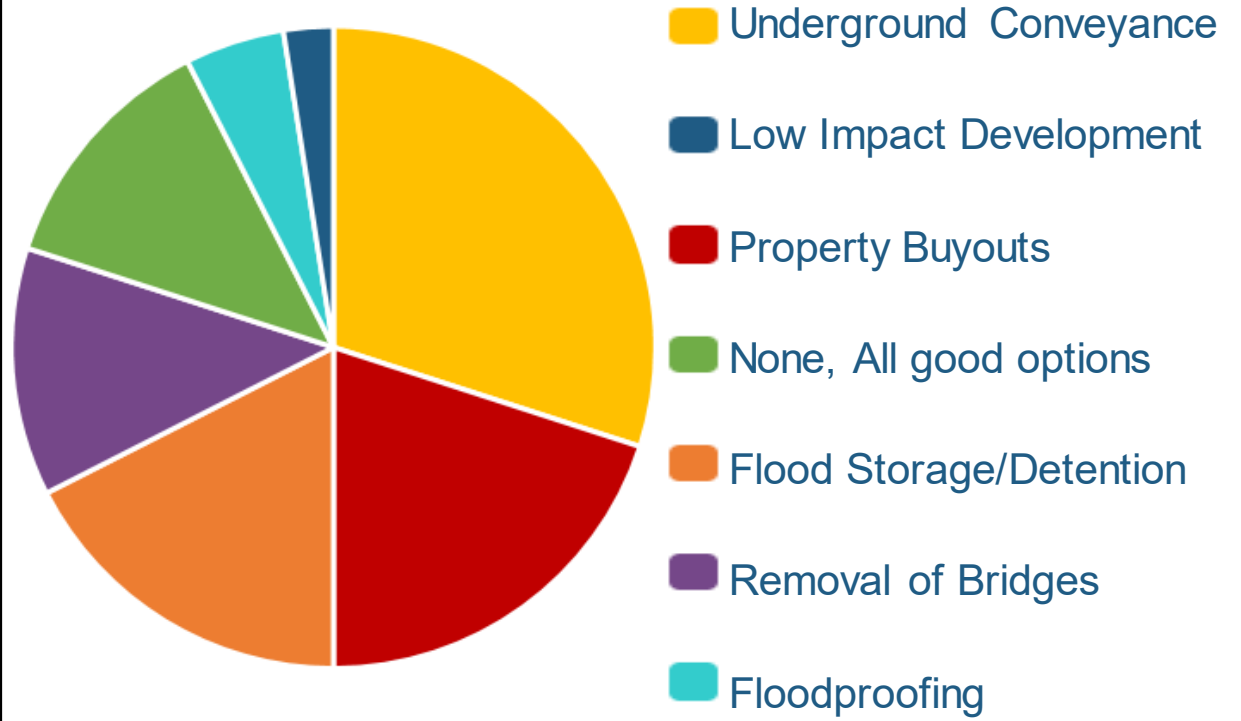


### Best Mitigation Option



~40 RESPONDENTS

### Worst Mitigation Option





# EXISTING FLOOD RISK











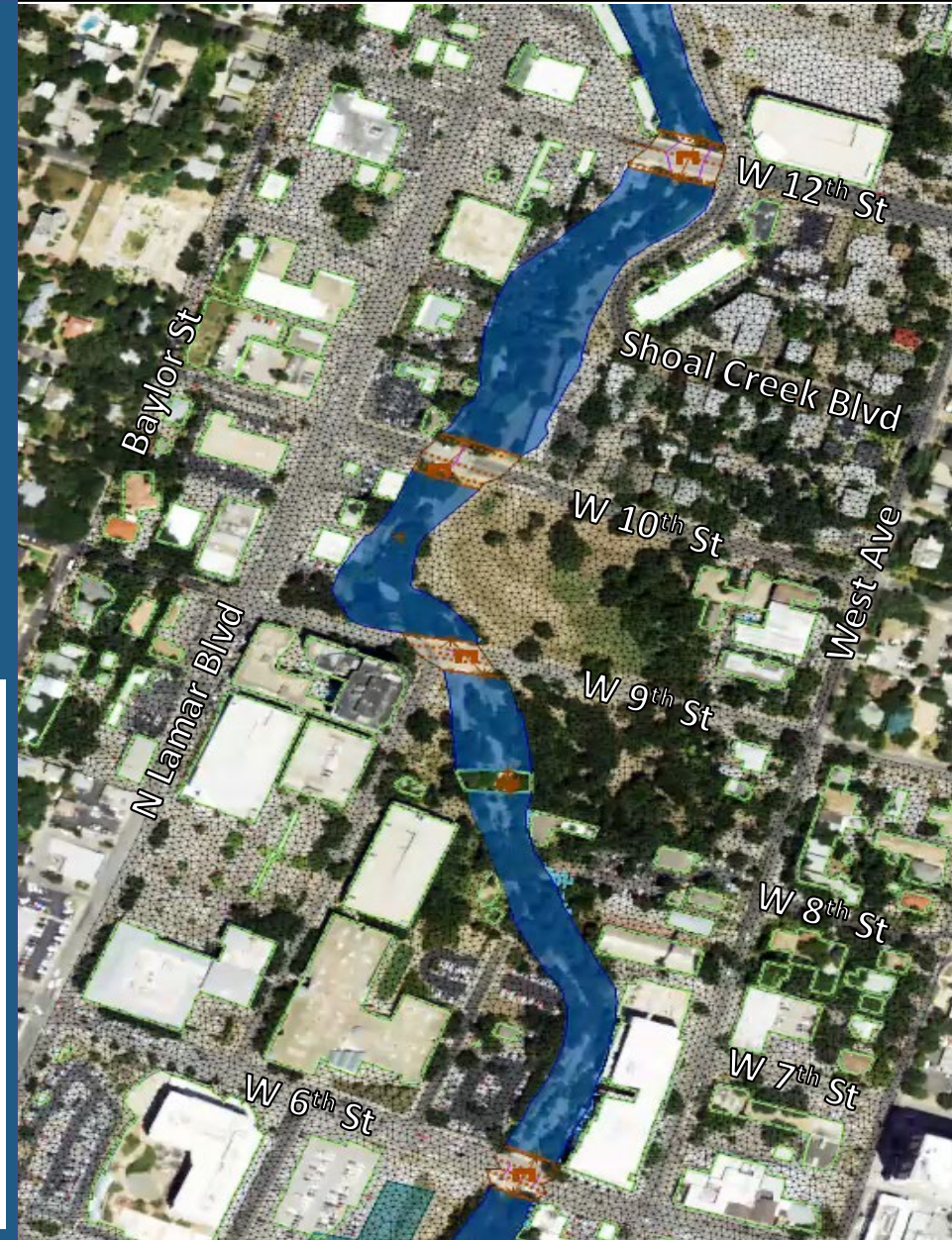
## Development of Floodplain Model

- Expanded the 2013 model
- Updated to current conditions
- Calibrated to May 2015 event

### LEGEND



Existing 1% Annual Chance  
(100-year) Depth

	0 - 2 feet
	2 - 5 feet
	5 - 10 feet
	10 - 15 feet
	15 - 20 feet
	Shoal Creek Channel







## Existing Condition Flood Risk

	10-year (10% chance)	25-year (4% chance)	50-year (2% chance)	100-year (1% chance)	500-year* (0.2% chance)
 <b>Inundated Structures</b>	36	48	54	61	85
<b>Inundated Roadway</b>	7,400 ft	9,700 ft	10,900 ft	12,300 ft	19,400 ft
 <b>Overtopped Roadways</b>	West & Lamar	5 <sup>th</sup> , 10 <sup>th</sup> , West, & Lamar	5 <sup>th</sup> , 6 <sup>th</sup> , 9 <sup>th</sup> , 10 <sup>th</sup> , West, & Lamar	5 <sup>th</sup> , 6 <sup>th</sup> , 9 <sup>th</sup> , 10 <sup>th</sup> , West, & Lamar	5 <sup>th</sup> , 6 <sup>th</sup> , 9 <sup>th</sup> , 10 <sup>th</sup> , 12 <sup>th</sup> , West, & Lamar

\* Estimated future 100-year using Atlas 14 rainfall





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\* Estimated future 100-year using Atlas 14 rainfall

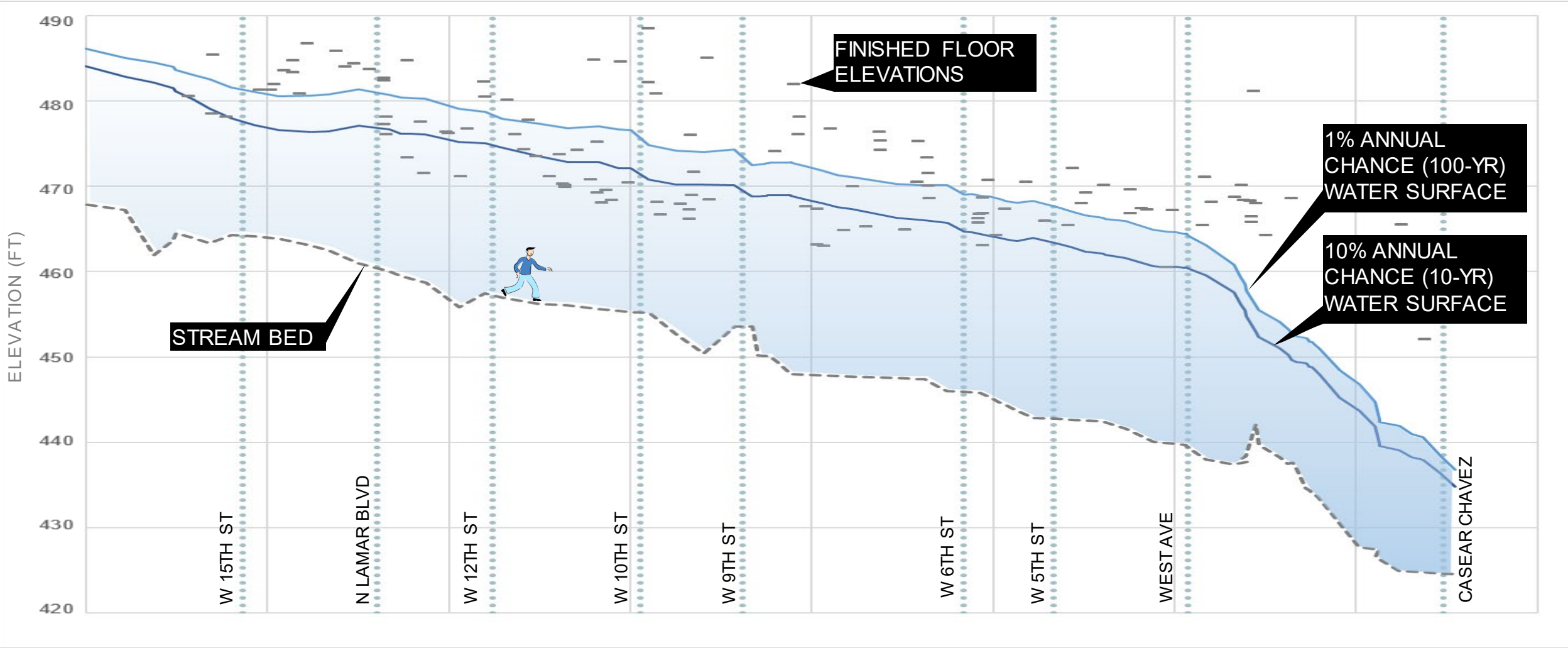


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\* Estimated future 100-year using Atlas 14 rainfall

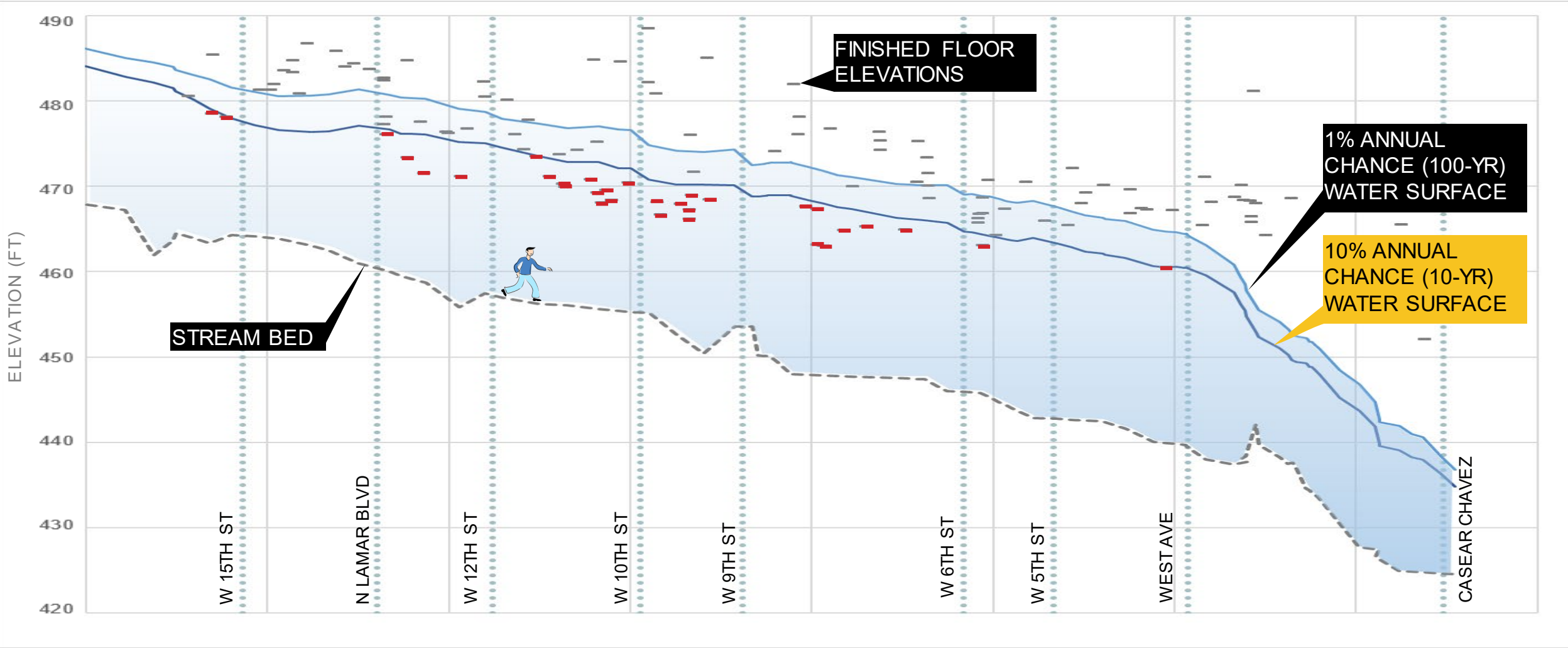
# ATX FLOOD SAFETY



## Water Surface Elevation Profile and Estimated Floor Elevations

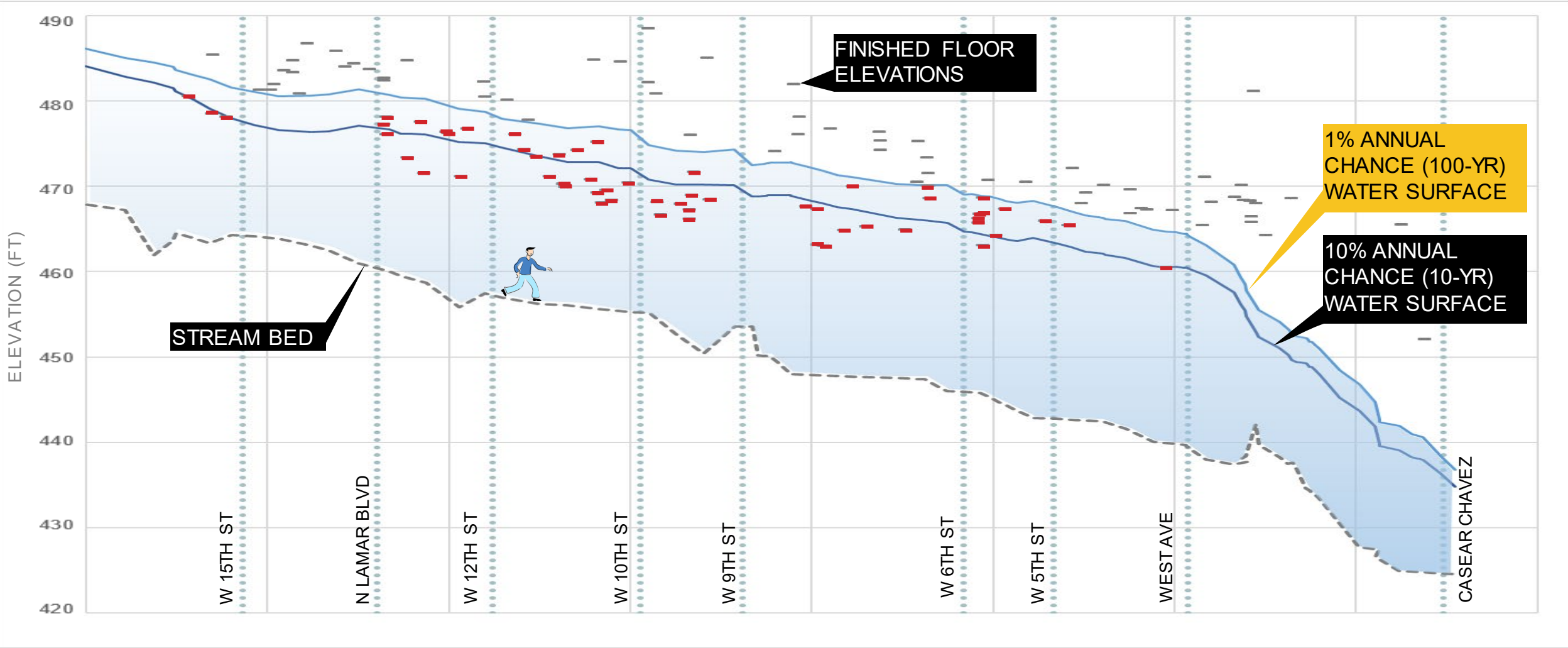


# ATX FLOOD SAFETY



Water Surface Elevation Profile and Estimated Floor Elevations

# ATX FLOOD SAFETY



## Water Surface Elevation Profile and Estimated Floor Elevations

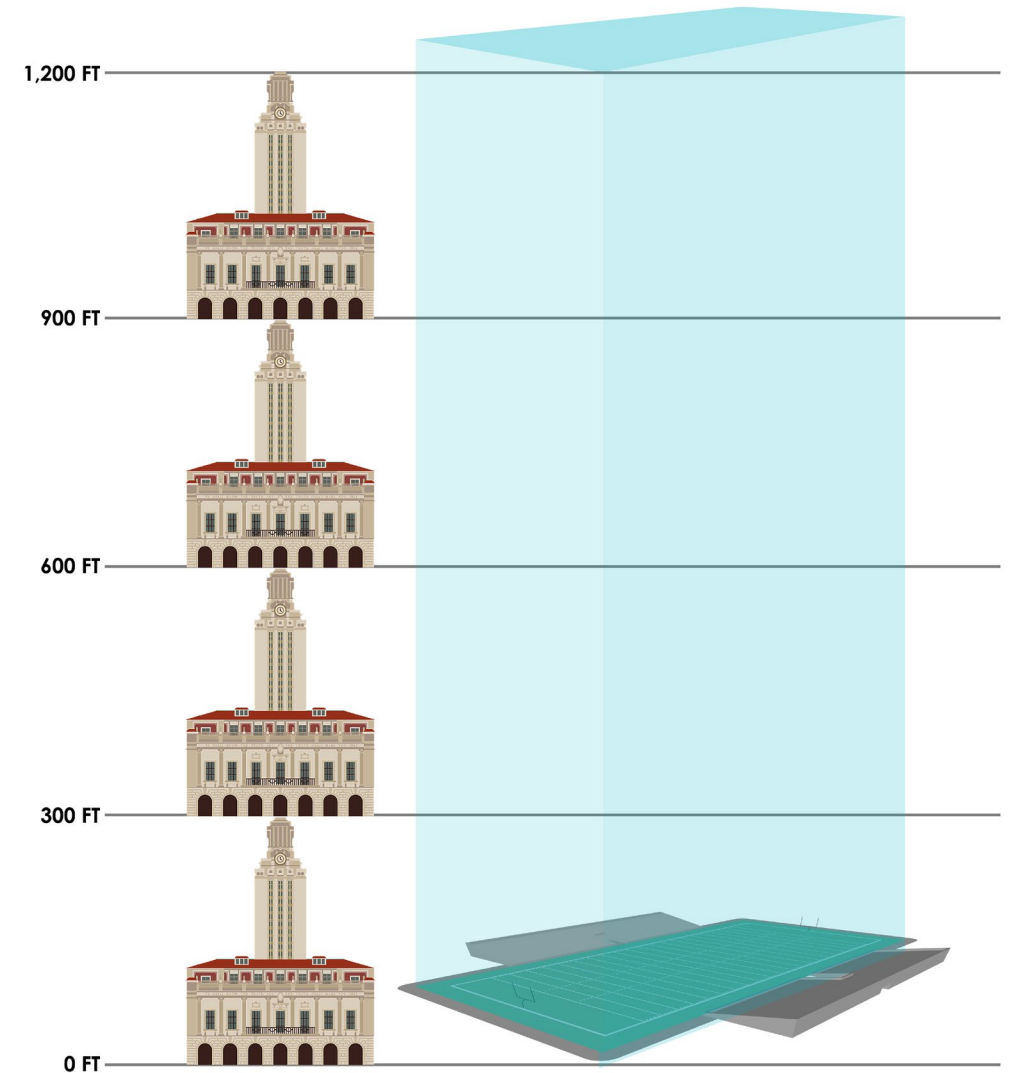


# FLOOD RISK REDUCTION ALTERNATIVES



## Required Conceptual Flood Storage

- Reduce 100-year down to 10-year
  - 2,400 acre-feet
- House Park Football Field
  - ~ 2 acres
- UT Tower
  - ~ 300 feet tall



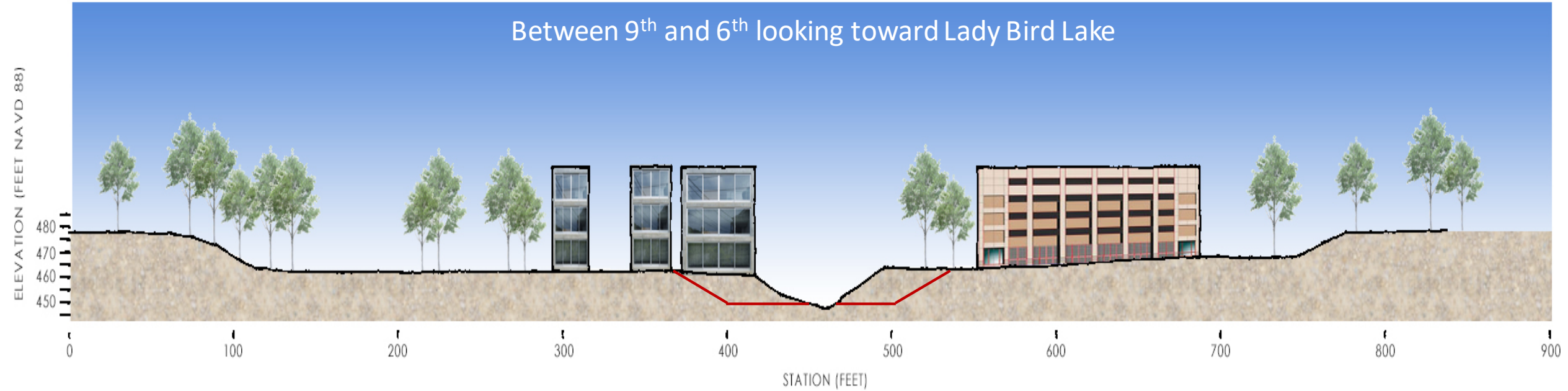
**2,400 acre feet = 800,000,000 gallons!**



# Required Conceptual Flood Conveyance

- 100-year contained in channel: ~ 100 feet wide, ~ 15 feet deep

Between 9<sup>th</sup> and 6<sup>th</sup> looking toward Lady Bird Lake

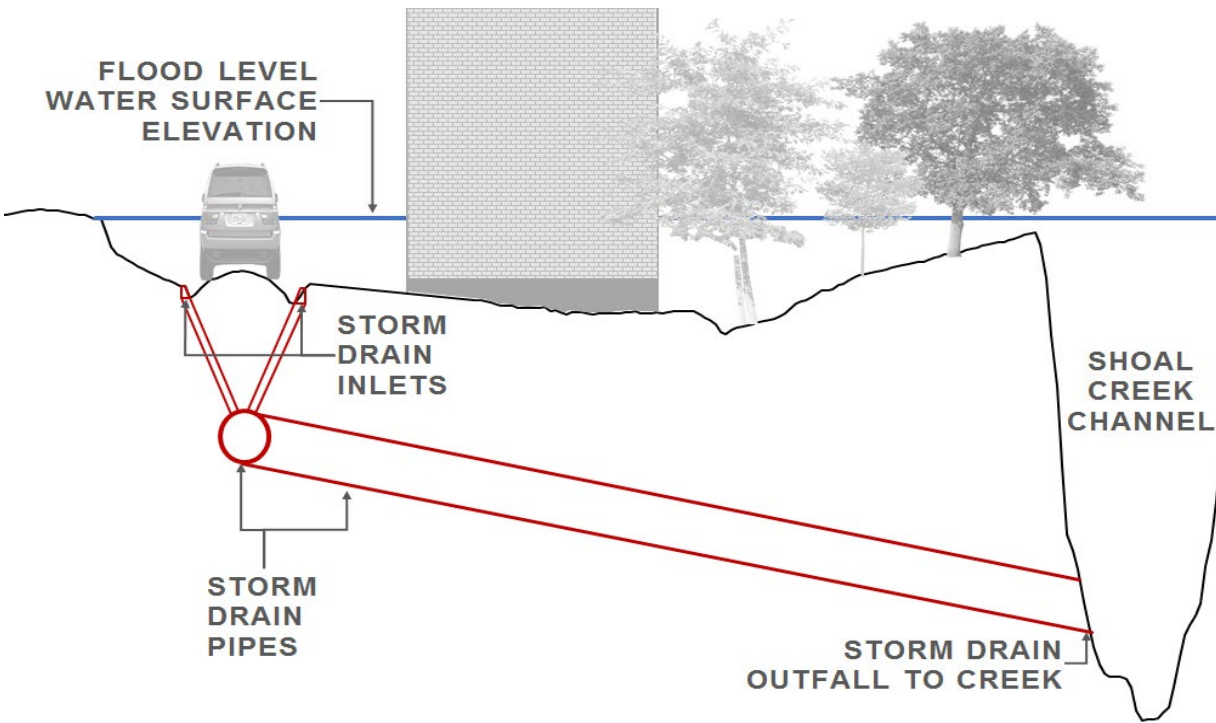


## Flood Risk Reduction Alternatives

- Larger Storm Drain Inlets
- Green Infrastructure
- Detention
- Channel Modifications
- Buyouts
- Underground Conveyance / Bypass
- Community Resilience





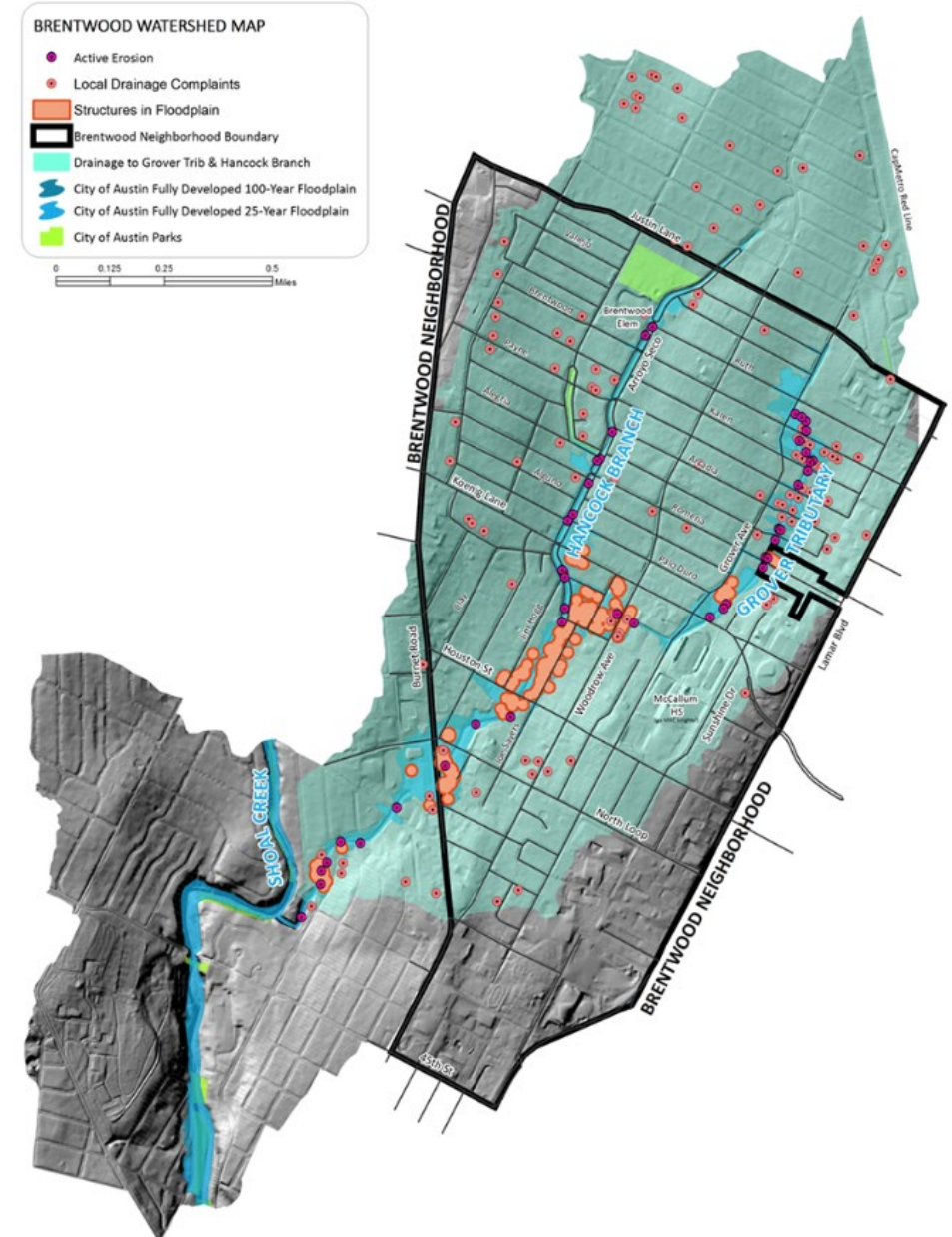


## Larger Storm Drain Inlets

- Roadway is inundated by 6-10 feet water
- Storm drains outfall to the creek
- Inlets are effective when creek levels are low

# Green Infrastructure

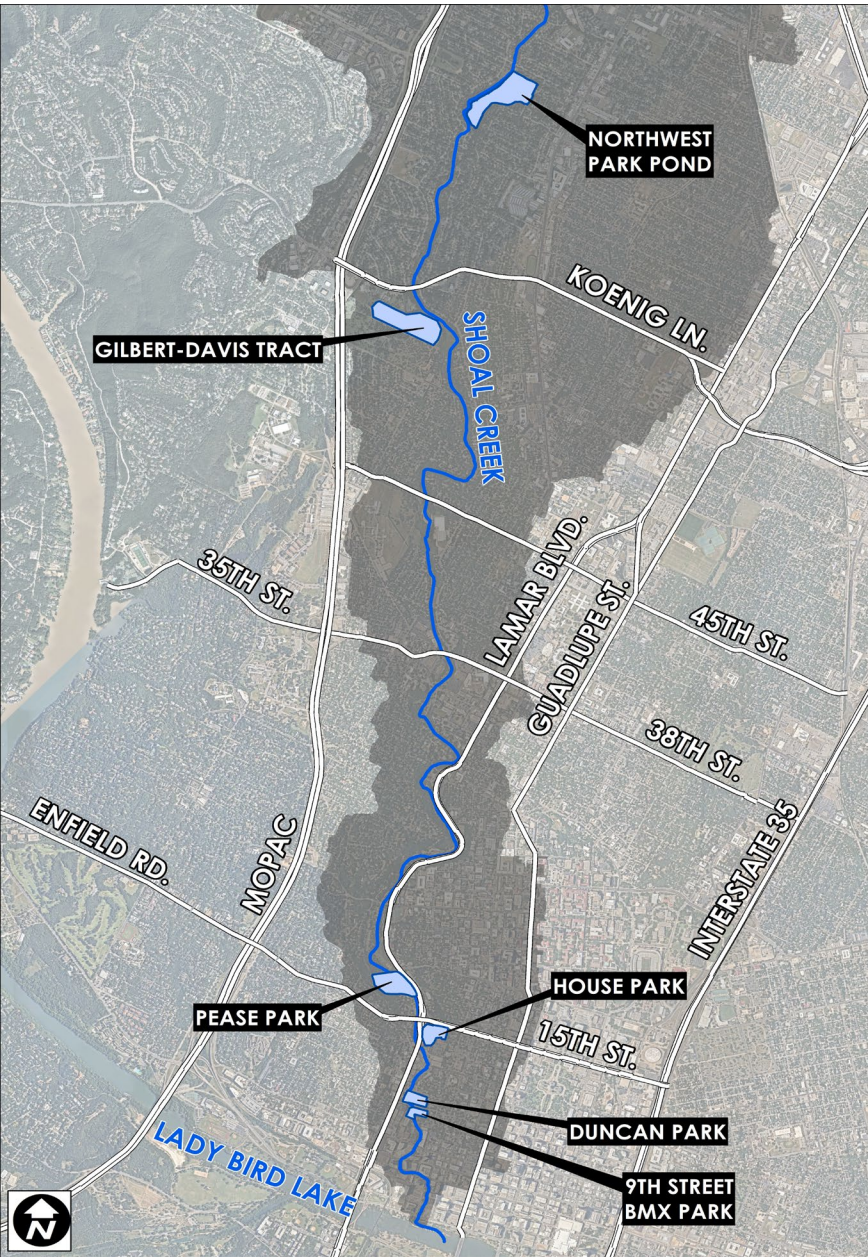
- Brentwood Neighborhood Study
  - Evaluated green infrastructure features in the Shoal Creek Watershed
  - Important aspect of best management practices
  - Provides water quality benefits for small rainfall events
  - Insignificant flood reduction benefits





## Conceptual Detention Ponds

- Within study area
  - 9<sup>th</sup> Street BMX Park
  - Duncan Neighborhood Park
  - House Park
- Upstream of study area
  - Pease Park
  - Gilbert-Davis Tract (adjacent to Austin Memorial Cemetery)
  - Expand Northwest Park Pond



# Conceptual Detention 100-year (1% Chance) Flood Risk Reduction



Removal of  
Inundated Structures



Removal of  
Roadway Inundation

## Gilbert-Davis Tract

- Located near Austin Memorial Cemetery
- 336 acre-feet of Storage
- Most effective detention pond that was evaluated

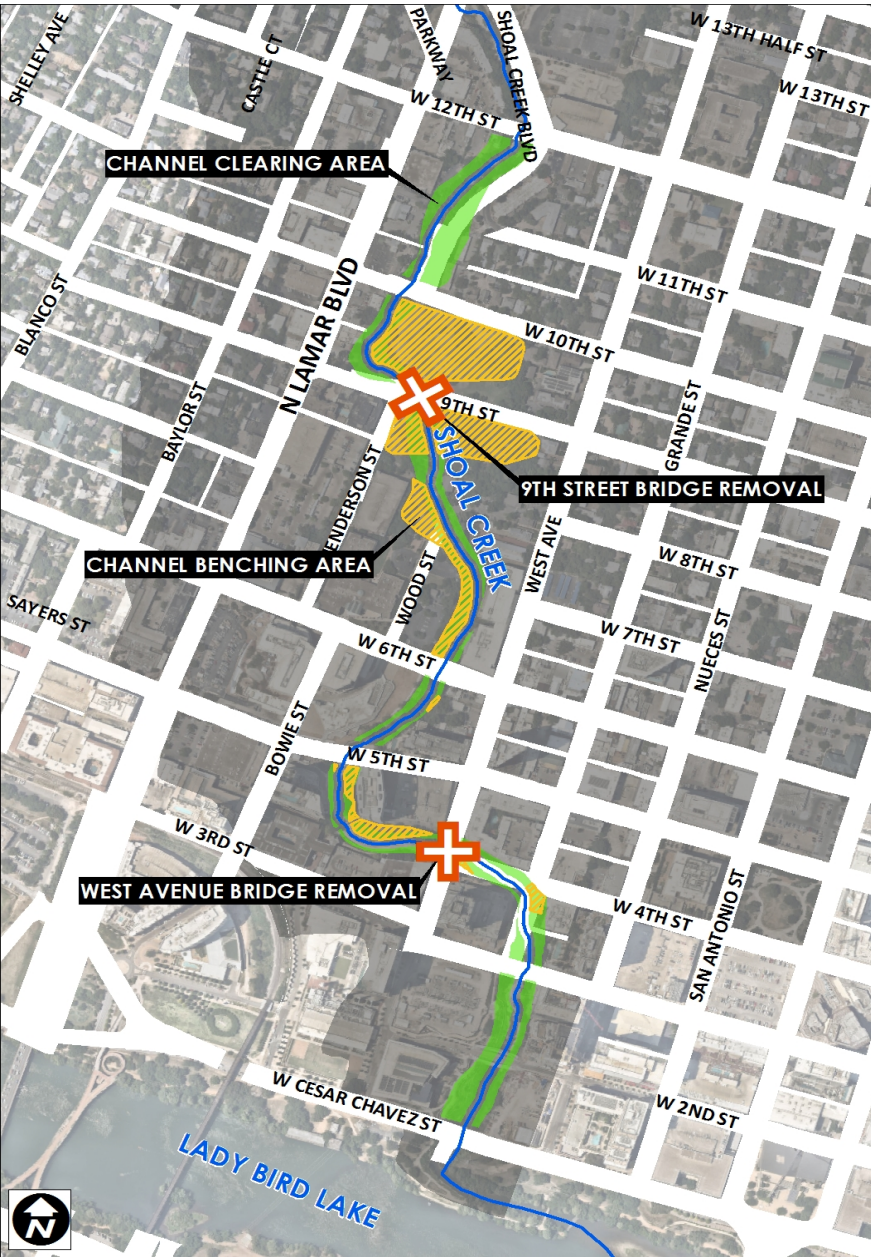
**6**  
of 61

**1,100 ft**  
of 12,300 linear feet



# Conceptual Channel Modifications

- Channel Benching
  - Expand channel where possible in project area
- Channel Clearing
  - Removal of underbrush and trees
- Removal of Constrictions (Bridges)
  - 9th Street, West Avenue, and Pedestrian crossing near West Avenue



# Conceptual Channel Modification 100-year (1% Chance) Flood Risk Reduction



**Removal of  
Inundated Structures**



**Removal of  
Roadway Inundation**

**Channel Benching**

**0**  
of 61

**0 ft**  
of 12,300 feet

**Channel Clearing**

**4**  
of 61

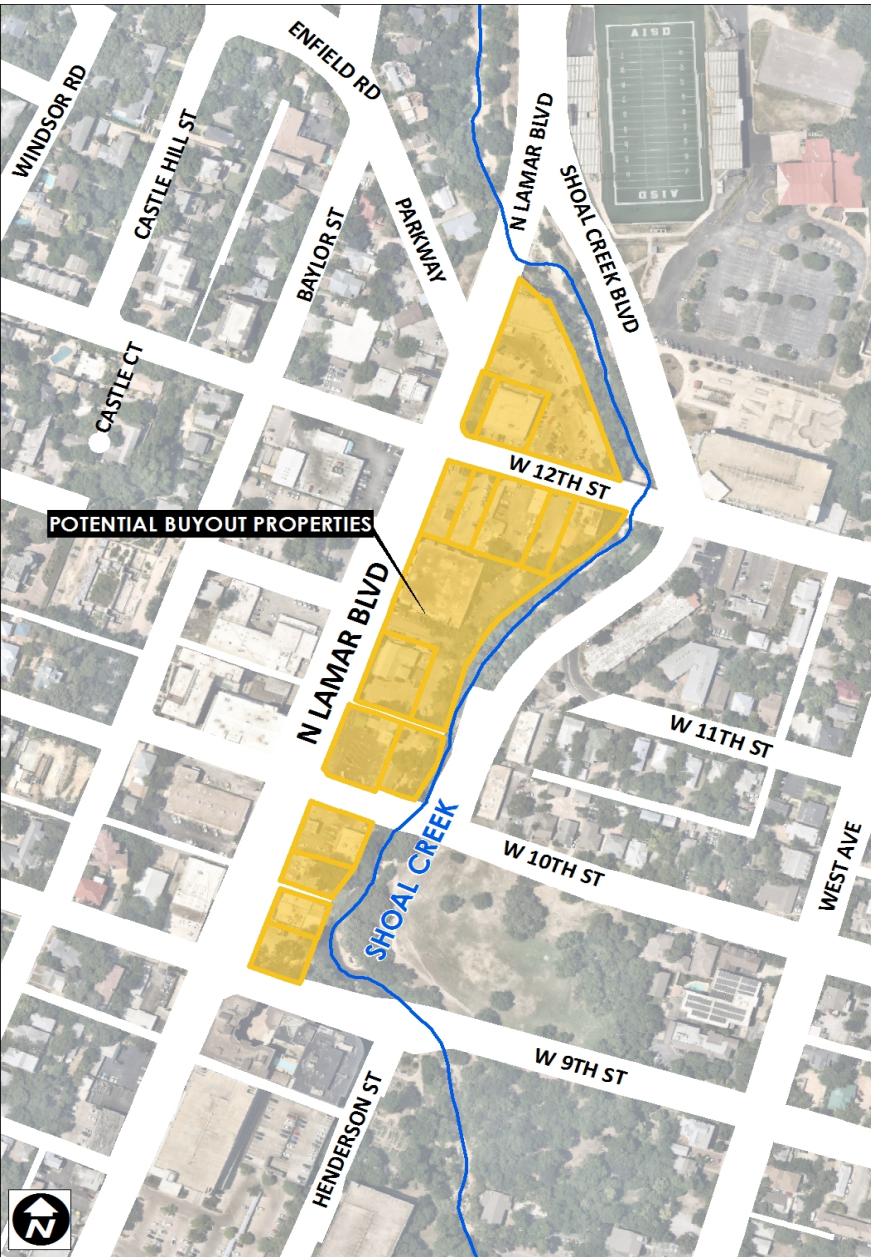
**800 ft**  
of 12,300 feet

**Bridge Removal**  
(West Avenue and Pedestrian Bridge)

**1**  
of 61

**600 ft**  
of 12,300 feet





## Buyouts

- Eastern side of Lamar Boulevard from 9<sup>th</sup> Street to Shoal Creek Boulevard
  - 16 high risk properties
- Roadways and other properties remain at risk
- Preliminary Estimate of Property Acquisition\*
  - \$45 Million

## Buyout 100-year (1% Chance) Flood Risk Reduction



Removal of  
Inundated Structures



Removal of  
Roadway Inundation

### Buyout

- Eastern Lamar Boulevard between 9<sup>th</sup> Street and Shoal Creek Boulevard
- 16 high risk properties

**16**  
of 61

**0 ft**  
of 12,300 linear feet



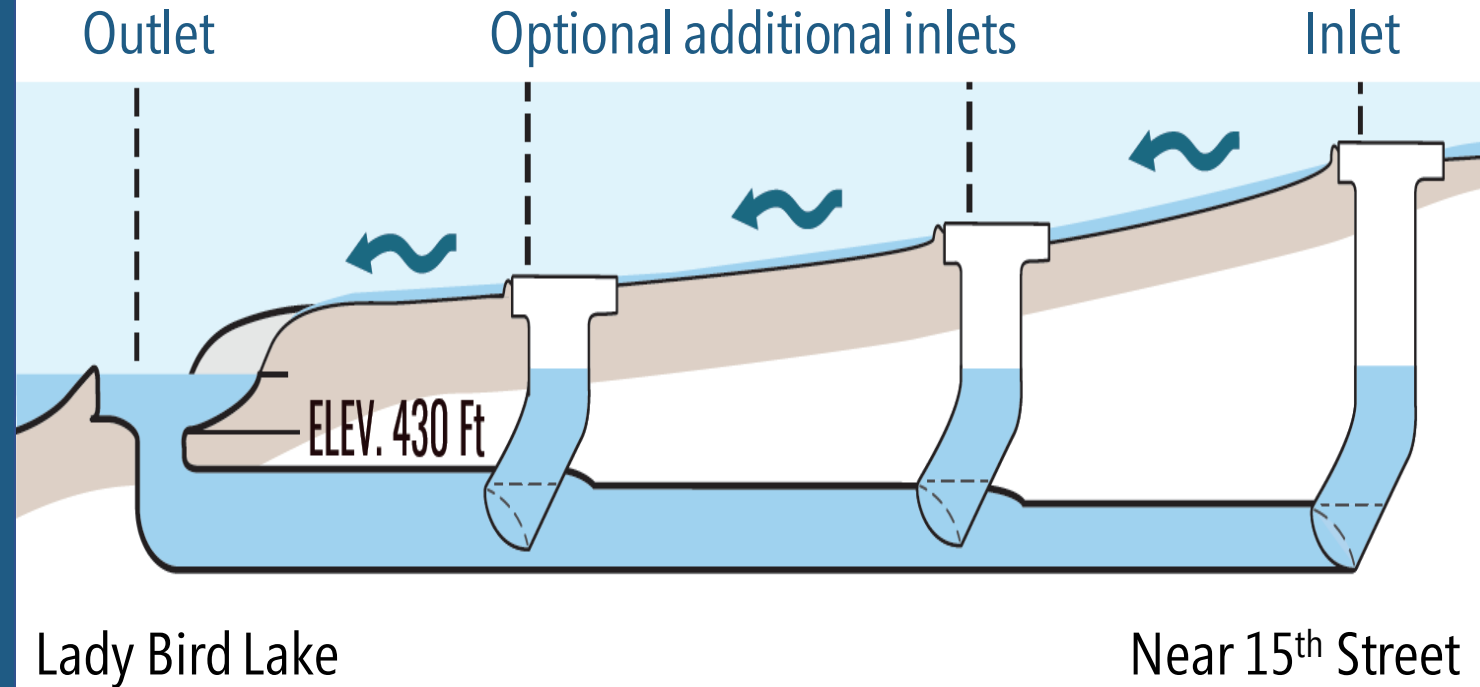


**Underground Conveyance / Bypass**



## Underground Conveyance

- Lamar A Bypass
- Lamar B Bypass
- Lorrain-Pressler Bypass



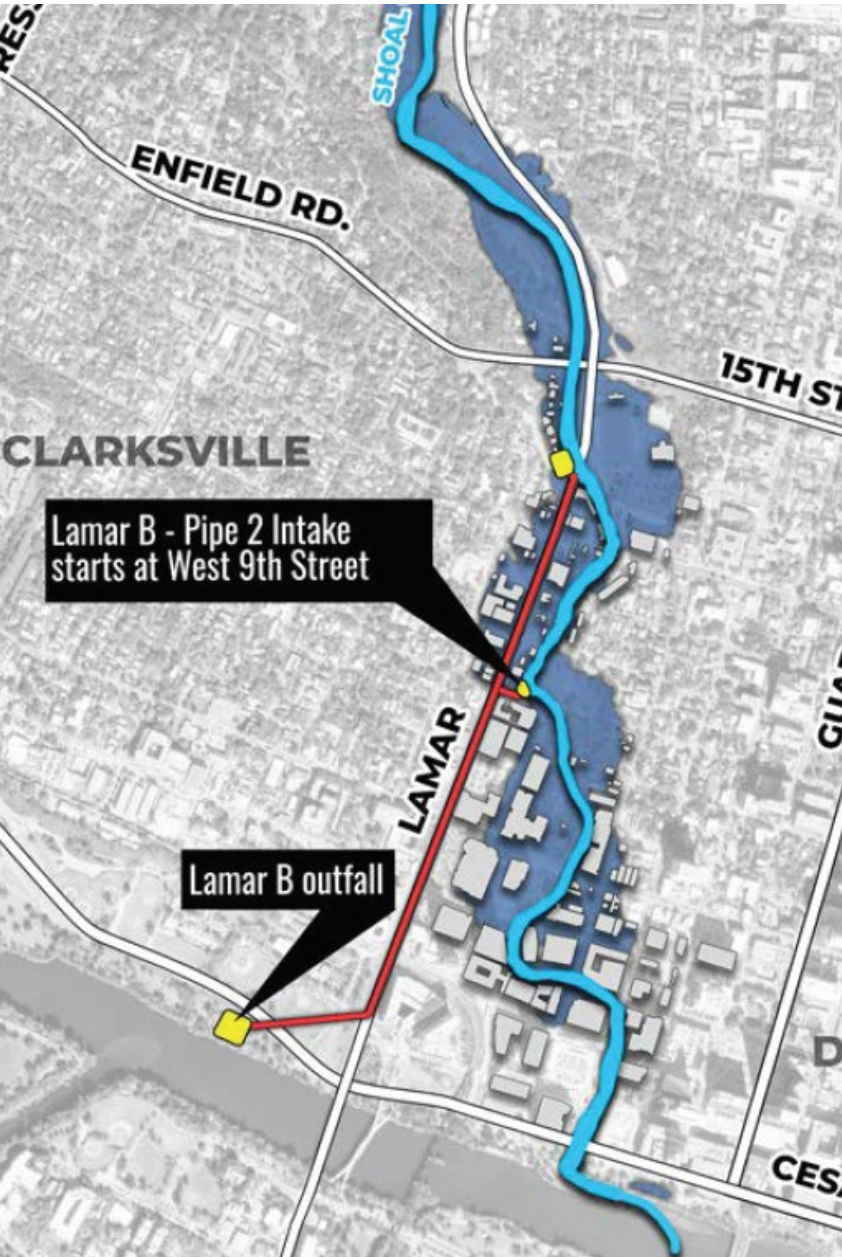


## Lamar A Bypass

- Inlet north of 15<sup>th</sup> Street
- Outfall at Lady Bird Lake
- 4 Bypass Options
  - 11 to 26 feet in Diameter
  - 6,600 to 8,000 feet in Length
  - Optional additional inlets at 9<sup>th</sup> Street and 6<sup>th</sup> Street
- Preliminary Estimate of Probable Cost\*
  - \$100 - 175 Million



\*Preliminary Estimates of Probable Construction Costs are subject to change upon further project refinement.



## Lamar B Bypass

- Inlet near Shoal Creek and Lamar Boulevard
- Outfall at Lady Bird Lake
- 2 Bypass Options
  - 11 to 13 feet in Diameter
  - 4,900 to 5,000 feet in Length
  - Optional additional inlet at 9<sup>th</sup> Street
- Preliminary Estimate of Probable Cost\*
  - \$80 - 120 Million

\*Preliminary Estimates of Probable Construction Costs are subject to change upon further project refinement.





## Lorrain-Pressler Bypass

- Inlet north of Enfield Road
- Outfall at Lady Bird Lake
- 2 Bypass Options
  - 22 to 26 feet in Diameter
  - 6,400 to 9,600 feet in Length
  - Optional additional inlet at 6<sup>th</sup> Street
- Preliminary Estimate of Probable Cost\*
  - \$100 - 150 Million

\*Preliminary Estimates of Probable Construction Costs are subject to change upon further project refinement.

# Conceptual Bypass 100-year (1% Chance) Flood Risk Reduction



**Removal of  
Inundated Structures**



**Removal of  
Roadway Inundation**

**Lamar B Bypass 2**  
11'-13' Diameter, 2 Intakes

**9** of 61

**1,400 ft** of 12,300 feet

**Lorrain-Pressler Bypass 2**  
22'-26' Diameter, 2 Intakes

**13** of 61

**2,400 ft** of 12,300 feet

**Lamar A Bypass 3**  
22'-23' Diameter, 2 Intakes

**19** of 61

**4,100 ft** of 12,300 feet

**Lamar A Bypass 4**  
26'-28' Diameter, 3 Intakes

**30** of 61

**6,400 ft** of 12,300 feet



**ATX FLOOD SAFETY**







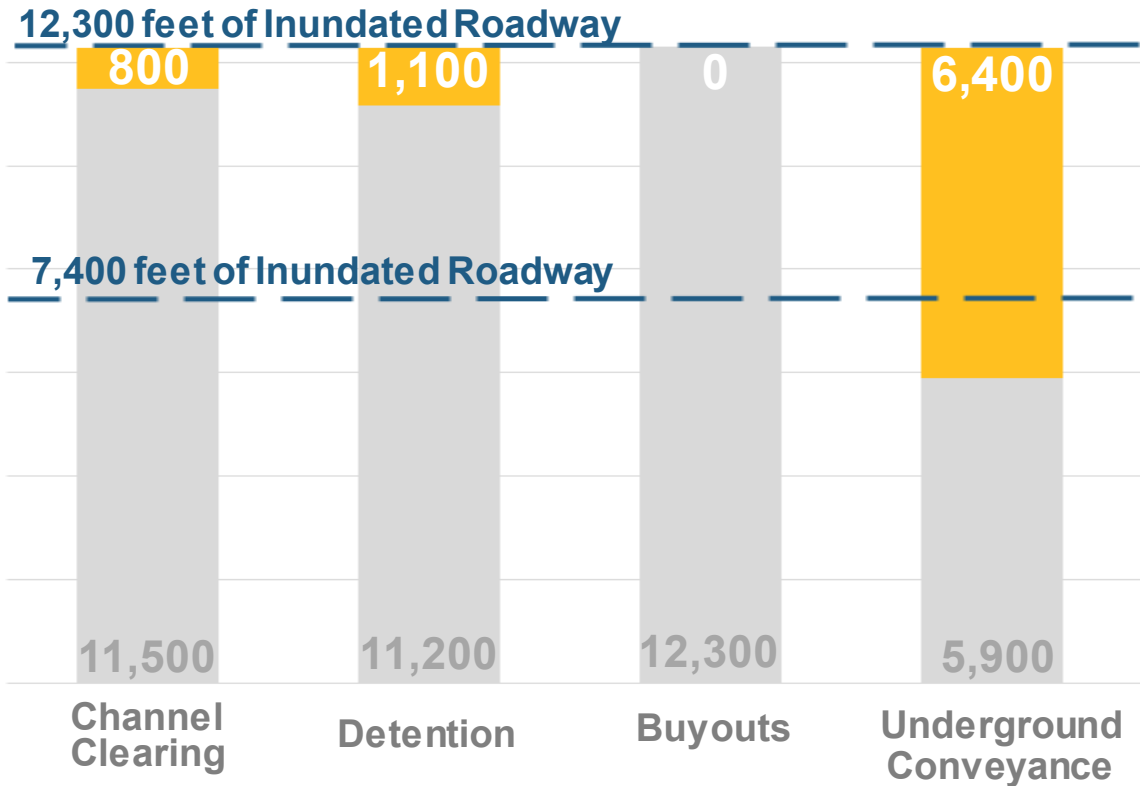
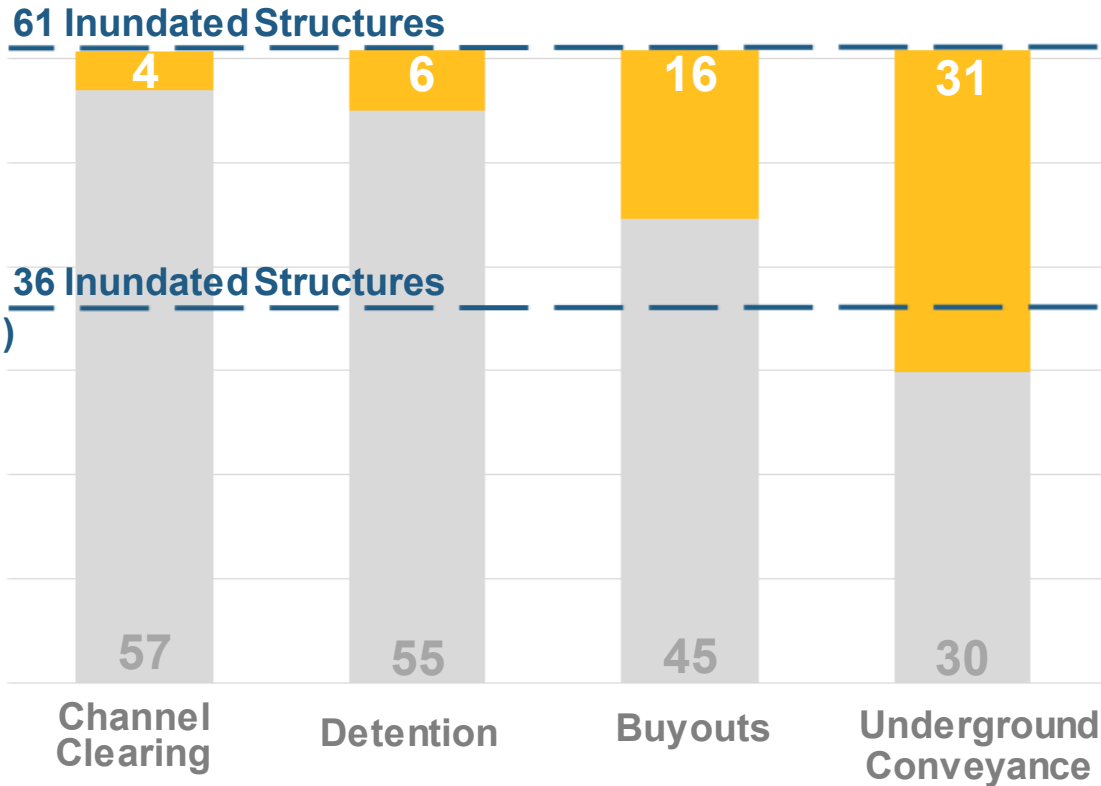
**Removal of Inundated Structures**



**Removal of Roadway Inundation**

**100-year (1% chance)**

**10-year (10% chance)**

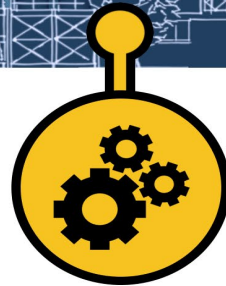




# Community Resilience



**FLOOD RESILIENT**  
standards for new  
development



**REDEVELOPMENT**  
incentives to  
elevate above  
floodplain



**PEOPLE**  
are prepared



**ACCESS**  
improved for safety

- Community Outreach
- Flood Warning Signage
- Encourage Elevation

- Development Regulations
  - New Development
  - Redevelopment
  - Height Restrictions

## Next Steps

### Finalize Feasibility Study

- Internal review & coordination with other City departments
- Additional public input
- Advance Community Resilience alternative
- Recommended alternative





## Websites

[AustinTexas.gov/ShoalCreekFloods](https://austintexas.gov/ ShoalCreekFloods)

## Contact us

[John.Middleton@AustinTexas.gov](mailto:John.Middleton@AustinTexas.gov)

512-974-3515





# QUESTIONS?

