Bond Election Advisory Task Force
Drainage & Flooding Needs Overview

August 4, 2017

WATERSHED PROTECTION

Presentation Overview

- Context & History
- Capital Solution Types
- Capital Solution Prioritization Methodology
- Capital Improvement Program
- 2018 Stormwater Bond Needs Assessment

Context & History

Watershed problems pose a recurring risk to our public safety, property, and water quality

Flooding

Public Safety

Erosion

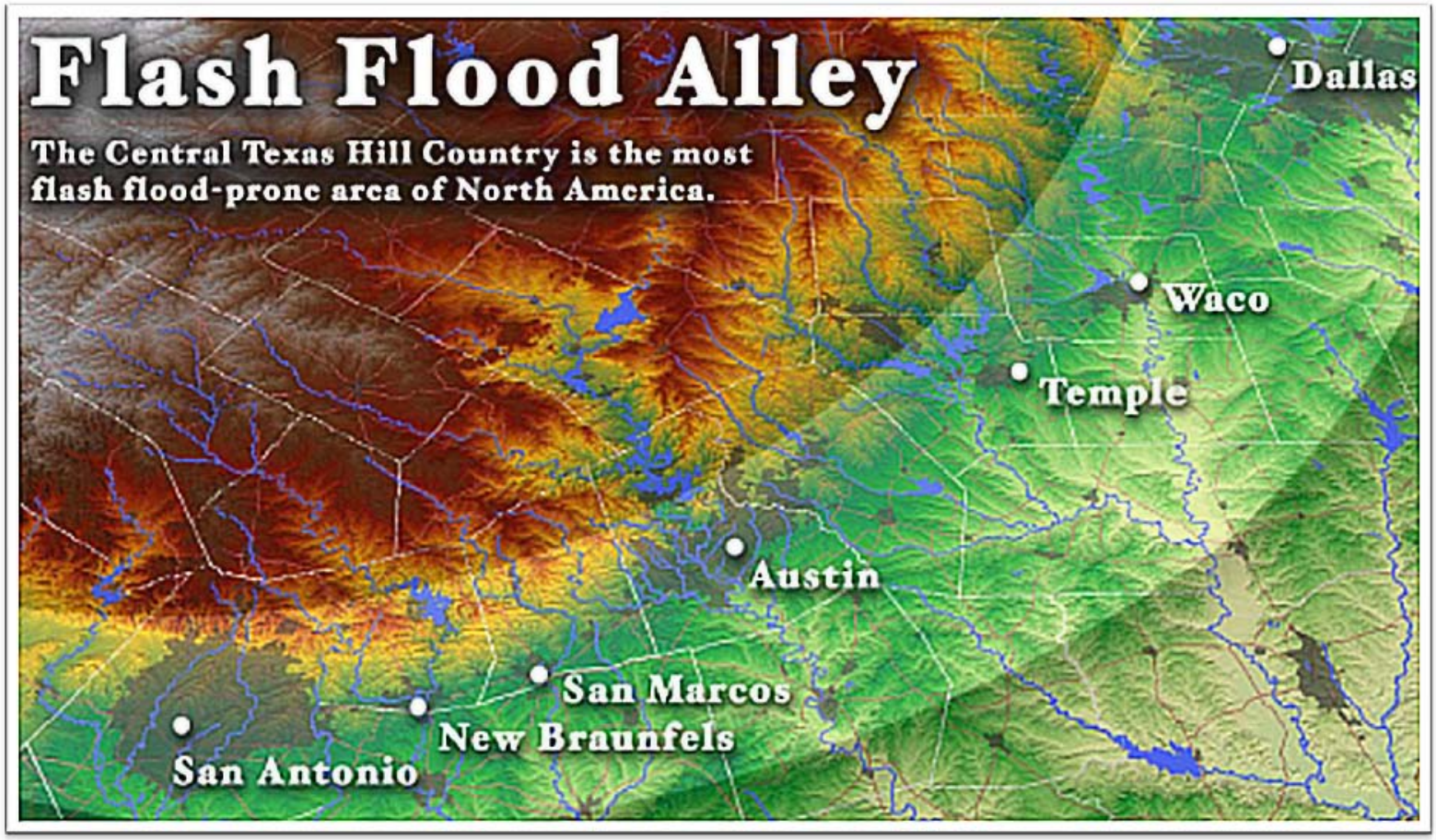
Property Protection

Water Pollution

Environmental Protection

*In less than 3 years, the Austin area experienced **4** floods that were declared **federal disasters**.*

Need for Flood Mitigation Services



Austin's Flood History

Major Austin Floods

1832
1833
1836
1843
1852
1869
1870
1900
1913
1915
1921
1932
1935
1936
1938

1915 - Sabine Street near Waller Creek

HAYS COUNTY
Search goes on for victims

1961 1975 1991 **2001** 2007 **2013** **2016**

1960 1974 **1981** **1998** 2004 2010 **2015**

Creek Flooding

Low-water crossings

Structure flooding

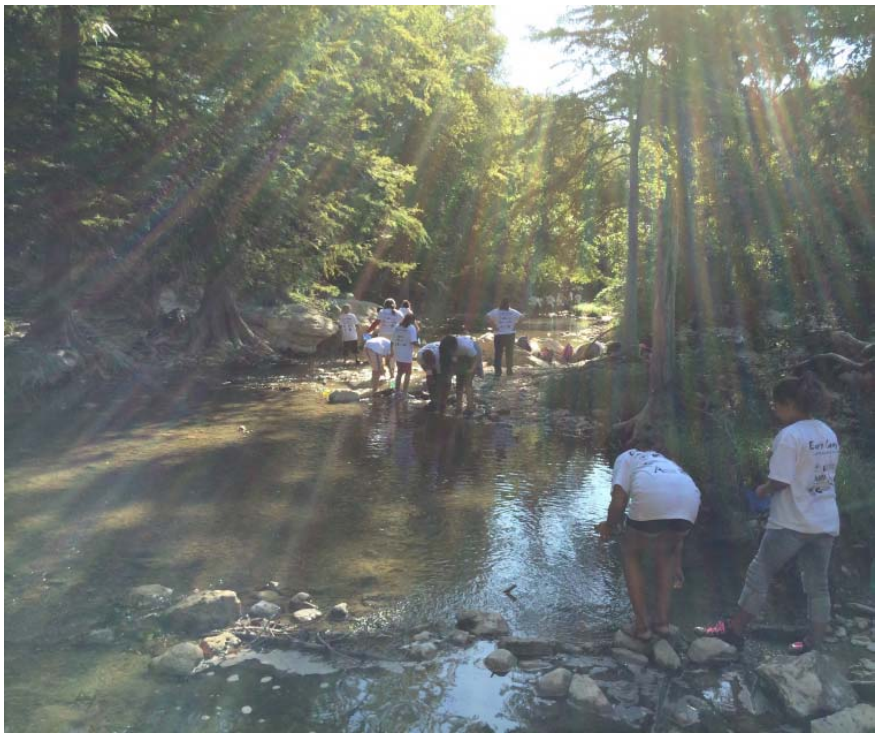
Localized Flooding

Building, yard, and street flooding as a result of overwhelmed drainage system

Channel Erosion

Water Quality & Quantity

Oil change materials in creek

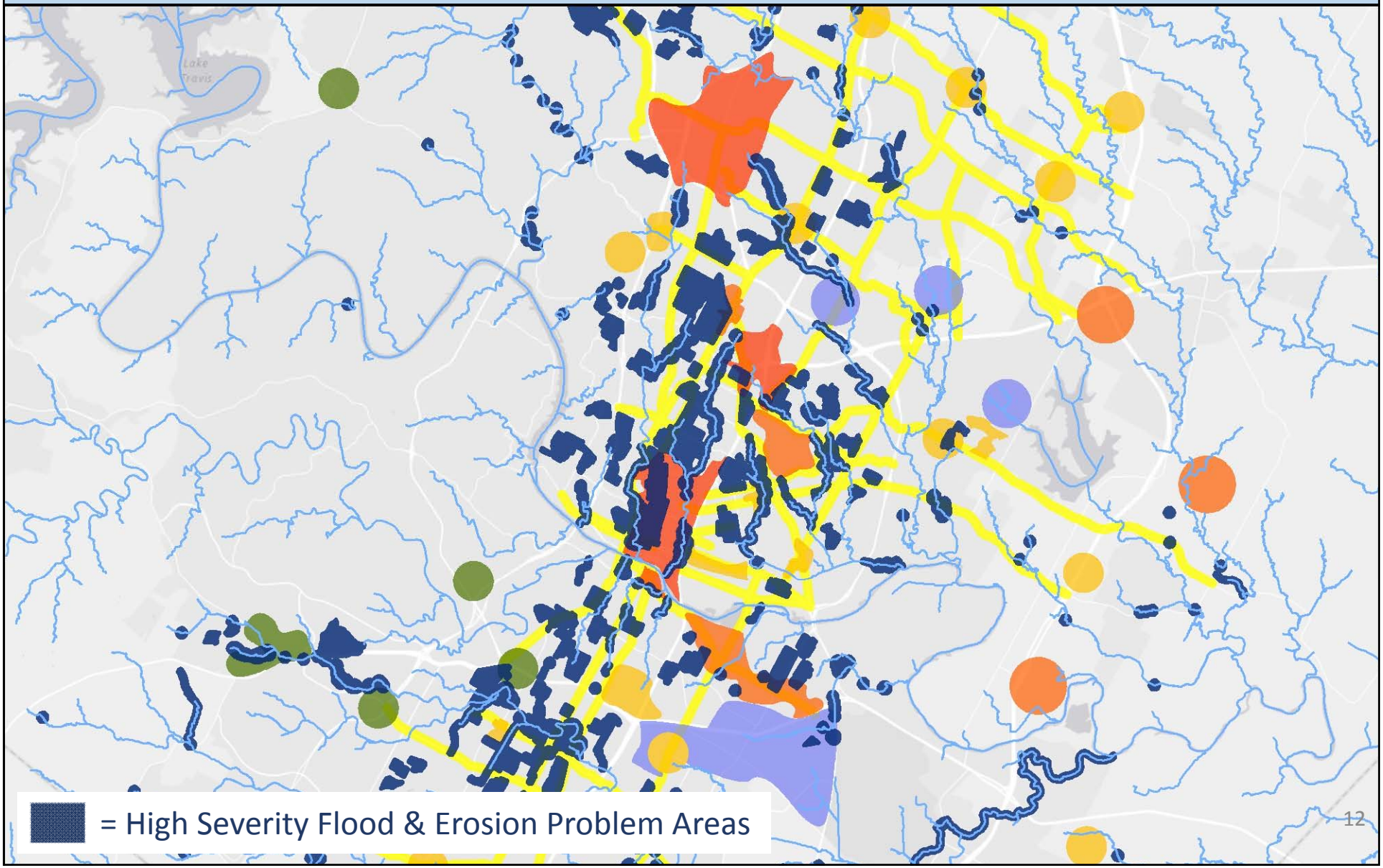


Students in Onion Creek

Watershed Progress & Challenges

2001 – 2016 progress	Remaining Challenges
Reduced flood risk for more than 1,850 buildings	Approximately 4,500 buildings in the 100-year floodplain and 1,900 at risk of inundation in a 100-year event Approximately 2,250 buildings with citizen-reported localized flooding
Upgraded 11 low water crossings	Approximately 300 low water crossings
Protected and restored more than 9 miles of streambank	Approximately 20 miles of streambank in need of repair
Removed more than 785 tons of pollution from stormwater runoff annually	23% of all reaches sampled have an overall condition less than “Good”

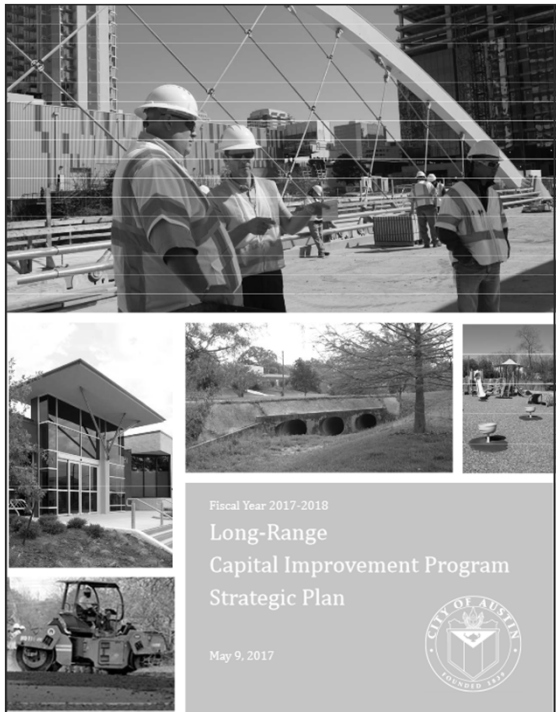
Imagine Austin Implementation



Projected **Unfunded** Capital Solution Costs

FY17 Rolling Needs Assessment

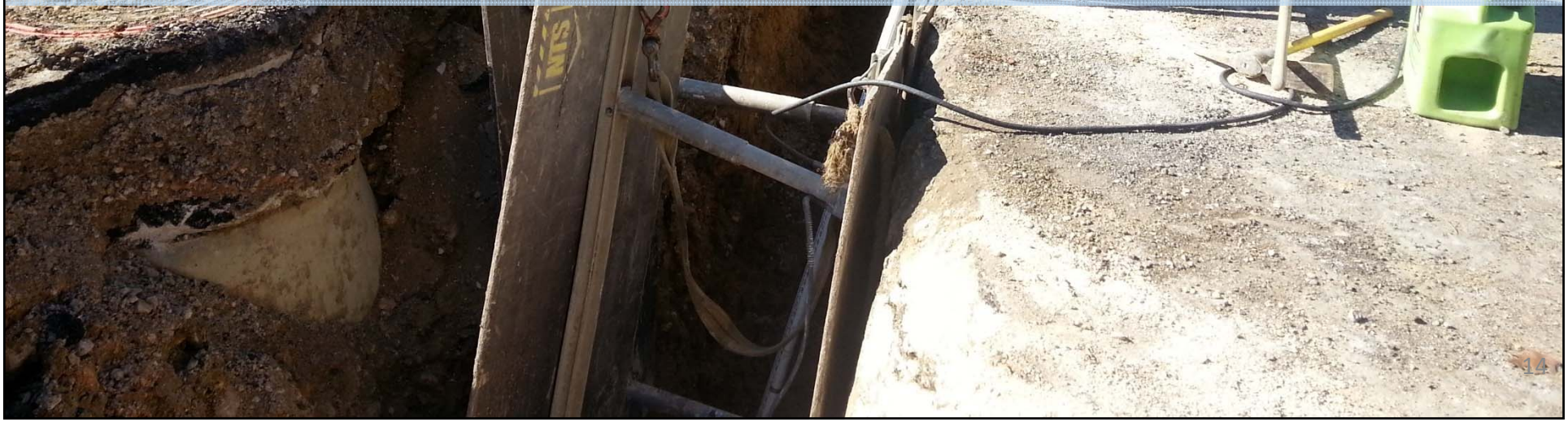
Category	Unfunded Need
Creek Flood (Top 20*)	$ 418M
Localized Flood (Top 20*)	$ 161M
Water Quality	$ 150M
Multi-Mission	$ 71M
Asset Management + Erosion	$ 1,142M



Estimated $1.94 Billion Total Unfunded Needs

*FY17 unfunded need reflects top 20 problem areas only – subset of much larger need.

Capital Solutions



Capital Solution Types

- Low-water crossing upgrades
- Detention and retention ponds
- Channel restoration/stabilization
- Storm drain improvements
- Diversion
- Barriers
- Structure elevating/flood-proofing
- Property acquisition
- Road closure

Flood Mitigation Projects
Structural

Before

After

David Moore Roadway Improvements

Low-water crossing upgrades:

culverts, bridges

Flood Mitigation Projects
Structural

Northwest Park detention facility

Detention and retention ponds: *Online, offline*

Channel restoration/stabilization
Structural

Before

After

Fort Branch Reach 6 Project

Flood Mitigation Projects
Structural

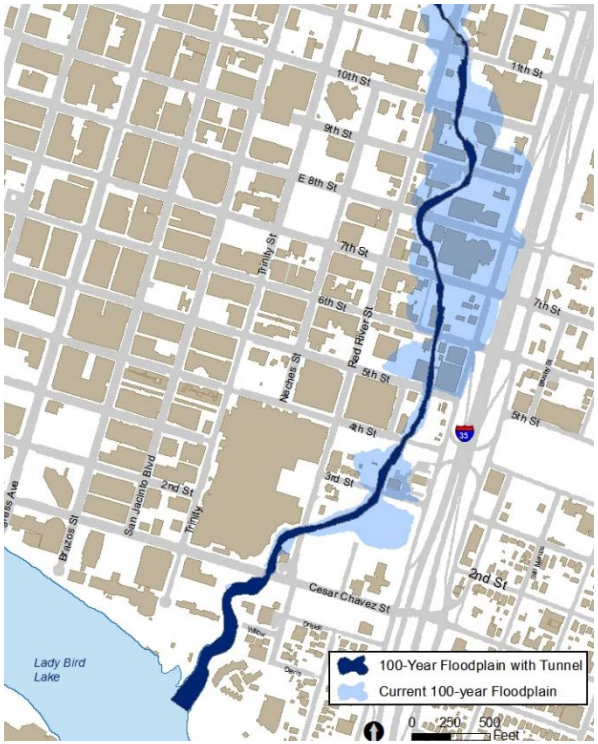
Storm Drain Improvements

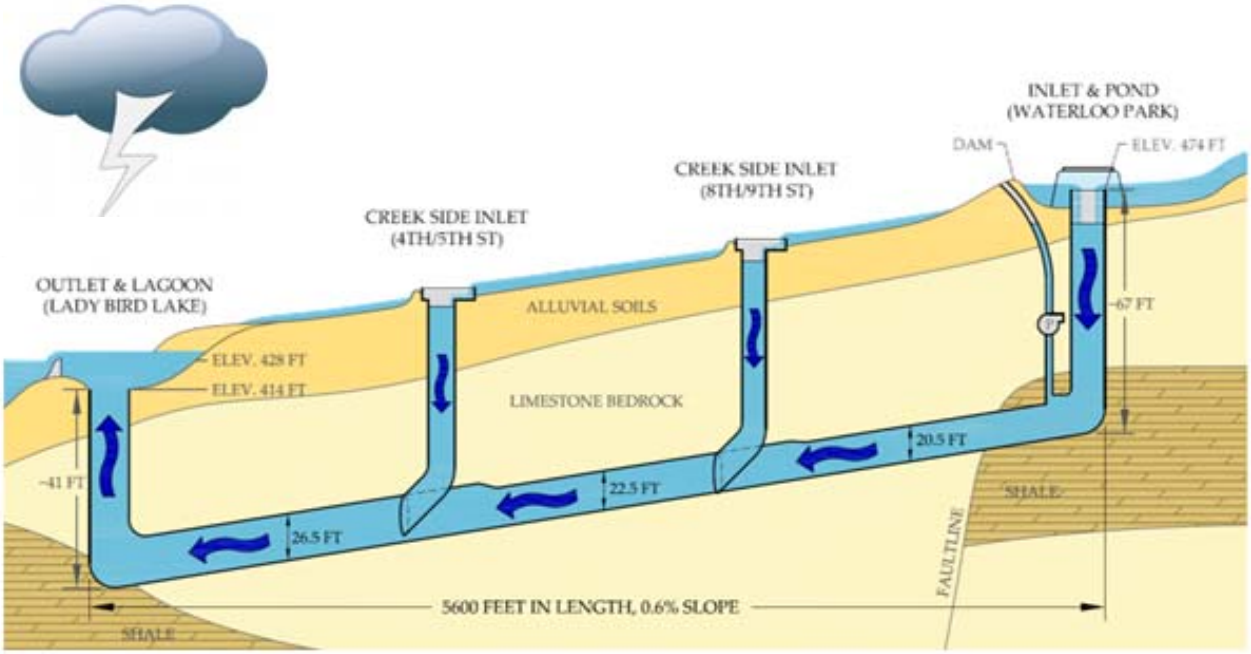

Inlets

Storm drain improvements:

pipes, inlets, ditches

Flood Mitigation Projects
Structural





Waller Creek Tunnel

Diversion: *tunnels*

Flood Mitigation Projects
Structural

Crystalbrook Floodwall

Barriers: *floodwalls, levees*

Flood Mitigation Projects
Nonstructural

Bayton Loop Property Acquisition

Nonstructural projects:

property acquisition, permanent road closures

Maintaining our drainage system

Pipeline Construction & Rehabilitation

Inlet Inspection/Cleaning

Public Ponds Maintenance

Lady Bird Lake Cleanup

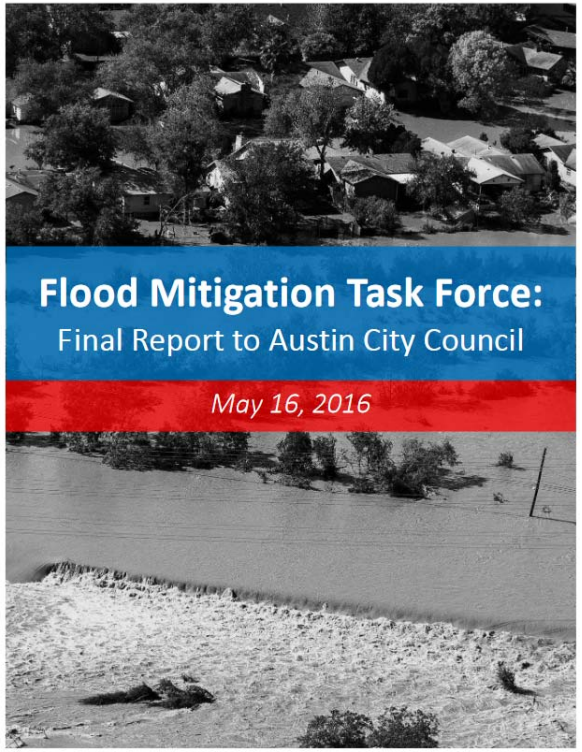
Erosion Repair & Stabilization

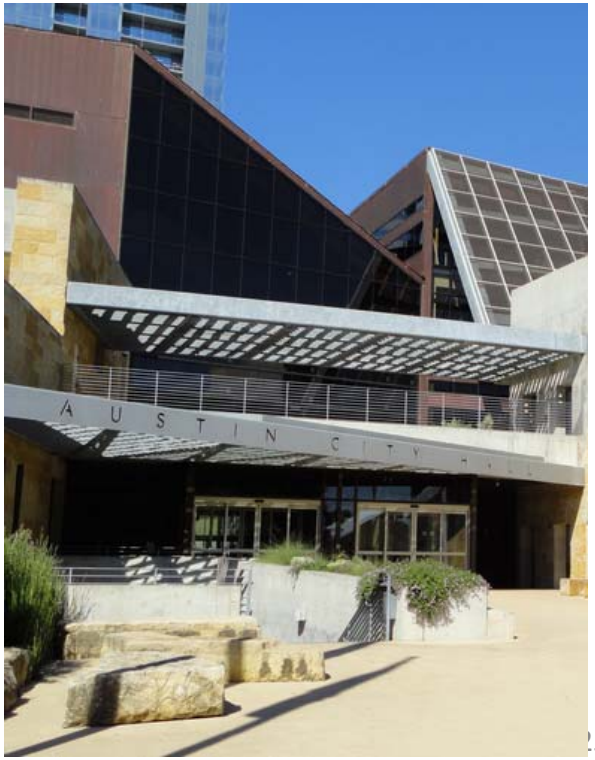
Open Waterways Maintenance

Capital Solution Prioritization Methodology

Watershed prioritization reflects community input and data-driven decisions

- Watershed Protection Master Plan
- Flood Mitigation Task Force
- City Council & Environmental Commission





Watershed needs prioritized based on severity

Watershed Protection Master Plan

- 18 member Citizen's Advisory Group
- Public input survey
- Public meetings across Austin
- Planning & Environmental Commissions
- City Council

→ Address worst problems first

Flood Mitigation Task Force

- 22 citizens appointed by Council District

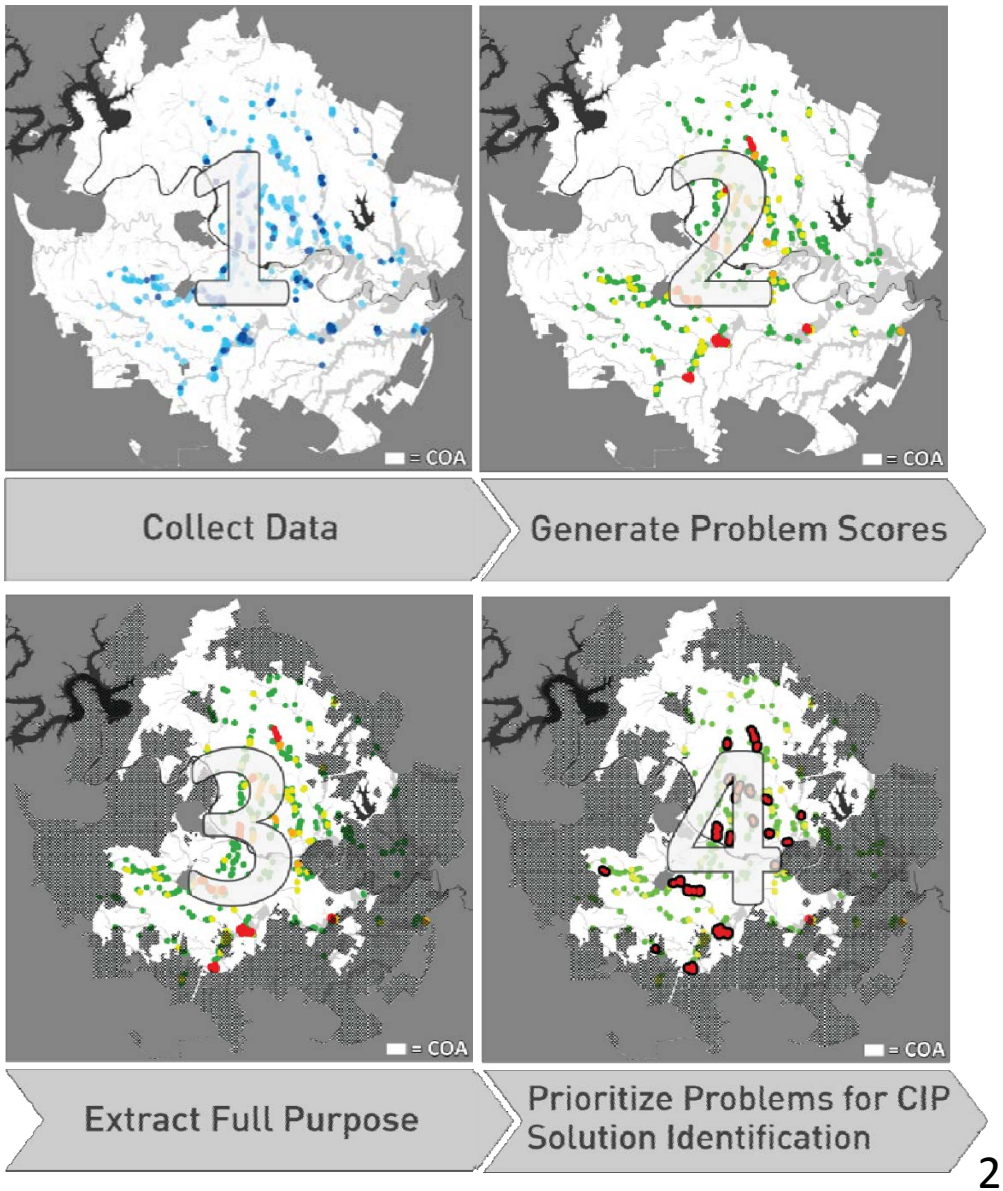
→ Allocate funding to most critical needs

City Council & Environmental Commission

→ Budget review and adoption

CIP Project Selection Methodology

- Collect data
- Generate problem scores
- Assess & prioritize problem areas
- Prioritize worst problems first
- Evaluate feasibility and timing of implementation



Example Problem Score Methodology: *Creek Flood Problem Score Components*

Structures

$$FT_{property} = RV * (\frac{1}{2} D_2 + \frac{1}{10} D_{10} + \frac{1}{25} D_{25} + \frac{1}{100} D_{100})$$

- Frequency of flooding (2-year, 10-year, 25-year, 100-year)
- Depth of flooding
- Type (house, school, commercial, etc.)

Low water crossings

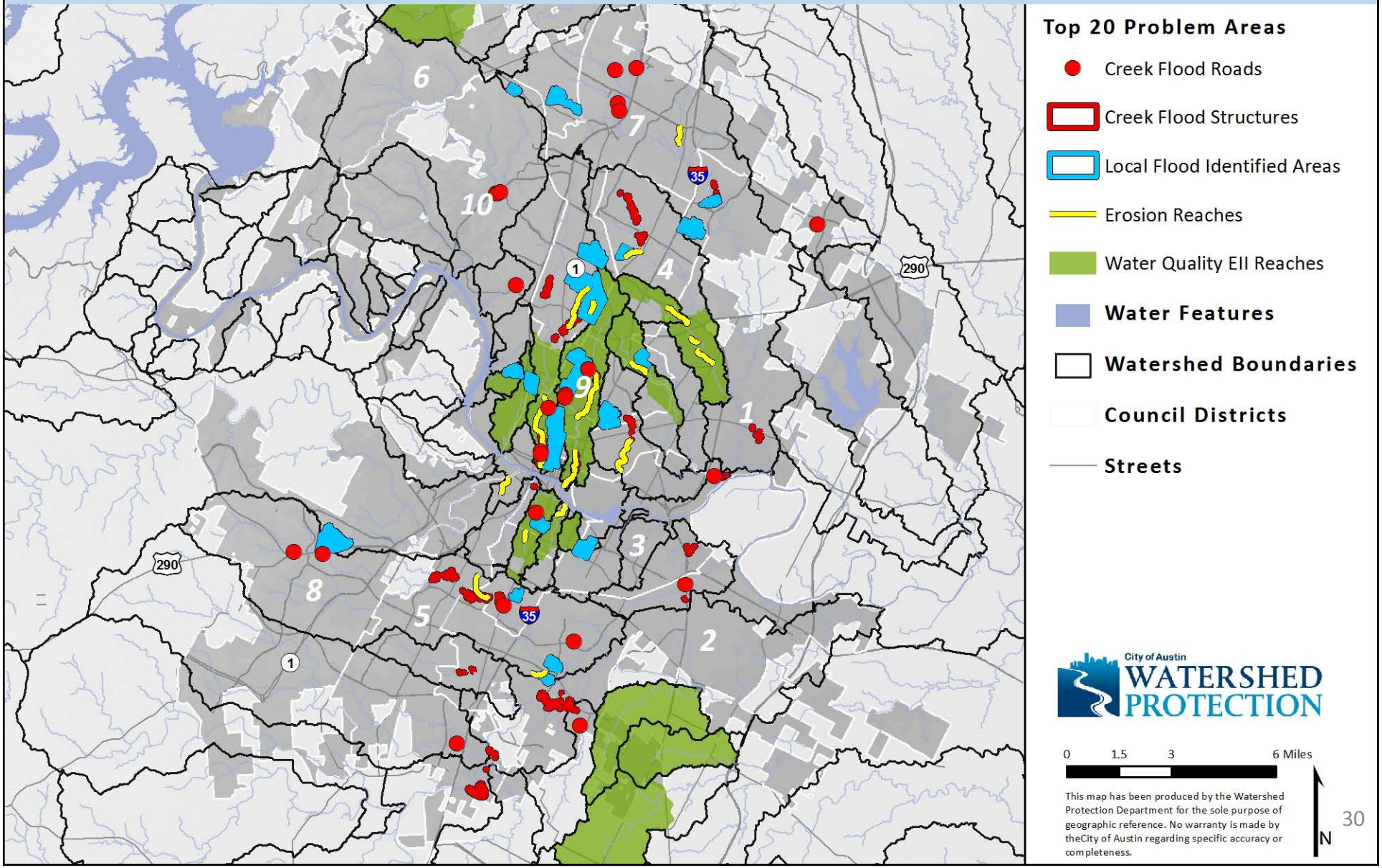
$$FT_{crossing} = RV * (\frac{1}{2} D_2 * V_2 + \frac{1}{10} D_{10} * V_{10} + \frac{1}{25} D_{25} * V_{25} + \frac{1}{100} D_{100} * V_{100})$$

- Frequency of flooding (2-year, 10-year, 25-year, 100-year)
- Depth of flooding
- Velocity of water over the road
- Type (arterial, collector, local, etc.)

Top 20 Problem Areas Example: *Creek Flood Structures*

Top 20 Rank	Risk Area/Problem Area Name	Structures at Risk	Normalized Score	Status
1	Lower Shoal Creek	66	100.0	Feasibility
2	Middle Williamson Creek - Cherry Creek to Congress	254	72.9	Implementation - Phase 1
3	Carson Creek - Metropolis Drive at US 183	6	50.8	Feasibility
4	Upper Onion Creek - Pinehurst Dr and Wild Dunes	184	20.2	Feasibility
5	Lower Onion Creek - Buyouts	131	19.5	Implementation - Phase 1
6	Lower Waller Creek - Tunnel (12th St to Lady Bird Lake)	27	18.4	Construction
7	Carson Creek - Bastrop Hwy and Patton Ave	13	16.1	Feasibility
8	Shoal Creek - Hancock and Grover Tributaries	96	11.8	Preliminary Engineering
9	Walnut Creek at FM 969	10	9.9	Feasibility
10	Walnut Creek - February Dr and River Oaks Trail	16	8.5	Implementation - Phase 1
11	Boggy Creek - Shelton Road at Delwau Ln	8	8.0	Feasibility
12	Little Walnut Creek - Metric to Rutland	79	7.5	Design
13	Boggy Creek - 38 1/2 St to 12th St	34	7.0	
14	Little Walnut Creek at Quail Creek Confluence	32	6.2	
15	Waller Creek - Hyde Park (Speedway, 47th to 44th St)	34	5.9	
16	West Bouldin - Barton Springs Rd at Dawson	2	4.7	
17	Shoal Creek at 49th St	7	3.9	
18	South Boggy Creek - Dittmar from S 1st to Lunar Dr	11	3.8	
19	Shoal Creek - White Rock to NW Park	28	3.7	
20	Gaines Tributary of Barton Creek	17	3.2	Preliminary Engineering

Citywide technical assessments ensure equity and transparency



Citywide technical assessments ensure equity and transparency.

Link to WPD Master Plan

Watershed Protection

Master Plan "Problem Score" Viewer

The City of Austin's Watershed Protection Department (WPD) protects the lives, property, and environment of our community by reducing the impacts of flooding, erosion, and water pollution. WPD performs technical studies to **identify problem areas** where watershed protection goals are not being achieved. This approach enables direct comparisons between watersheds and **promotes consistency** among all missions.

Worst Problems First: The "Problem Score Approach"

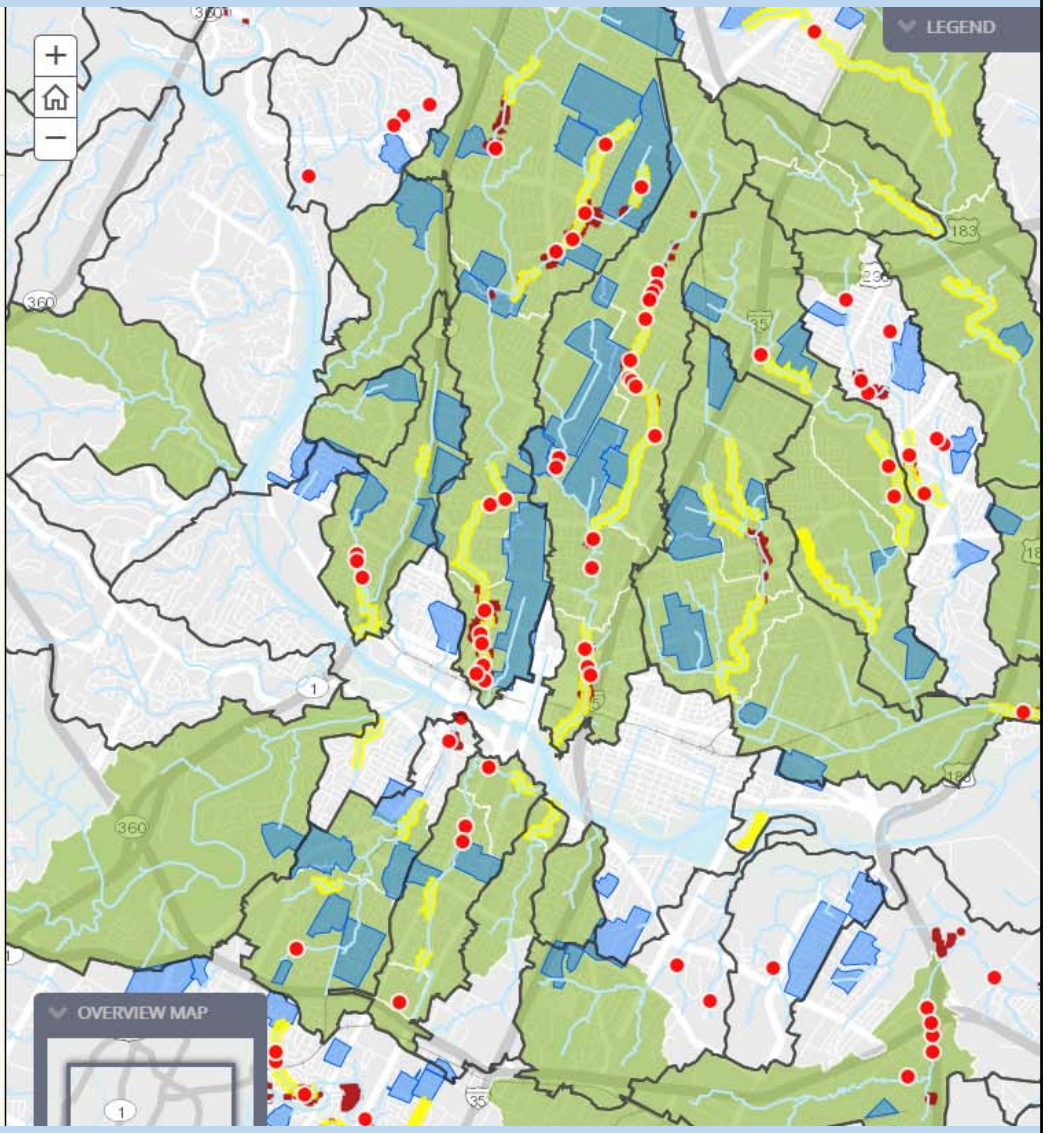
Problem Score systems quantify and prioritize problem areas for each of the department missions: **Creek Flood, Local Flood, Erosion Control, & Water Quality.** Each mission develops problem scores to assign a numeric value and severity description to watershed problems, such as individual erosion sites or structures in floodplains. The areas with the highest problem scores are designated **"Very High" or "High" severity problem areas**, and are considered to be at the highest risk of flood, erosion, or water quality degradation.

High & Very High Severity Problem Areas

- Creek Flood Road Crossings
- Creek Flood Structures (buildings)
- Local Flood Problem Areas
- Erosion Creek Segments

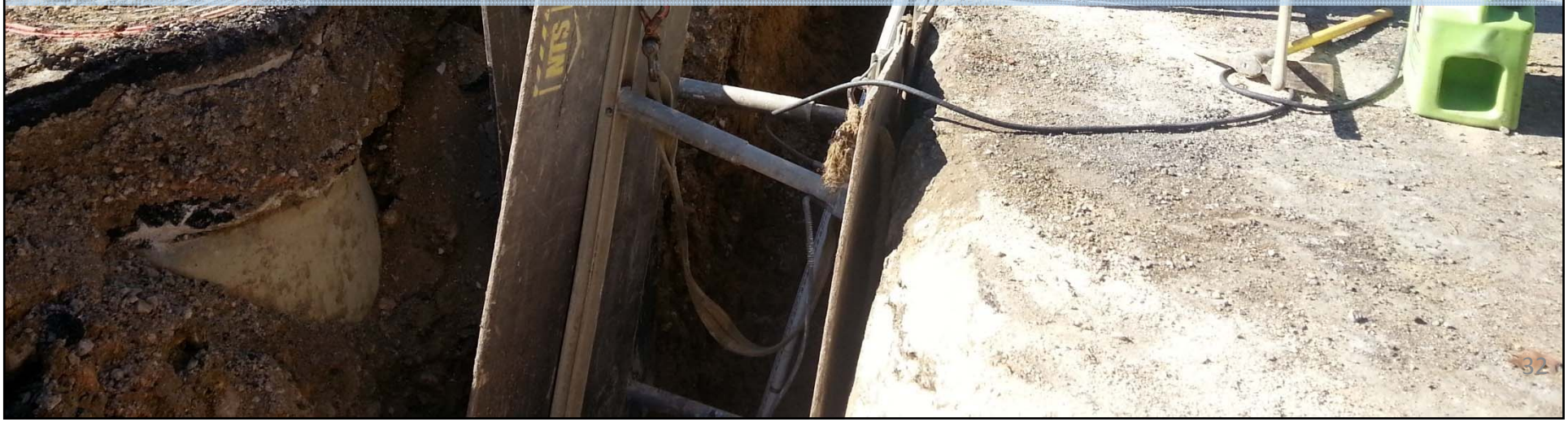
Reference

- Creeks
- Watersheds
- Building Footprints

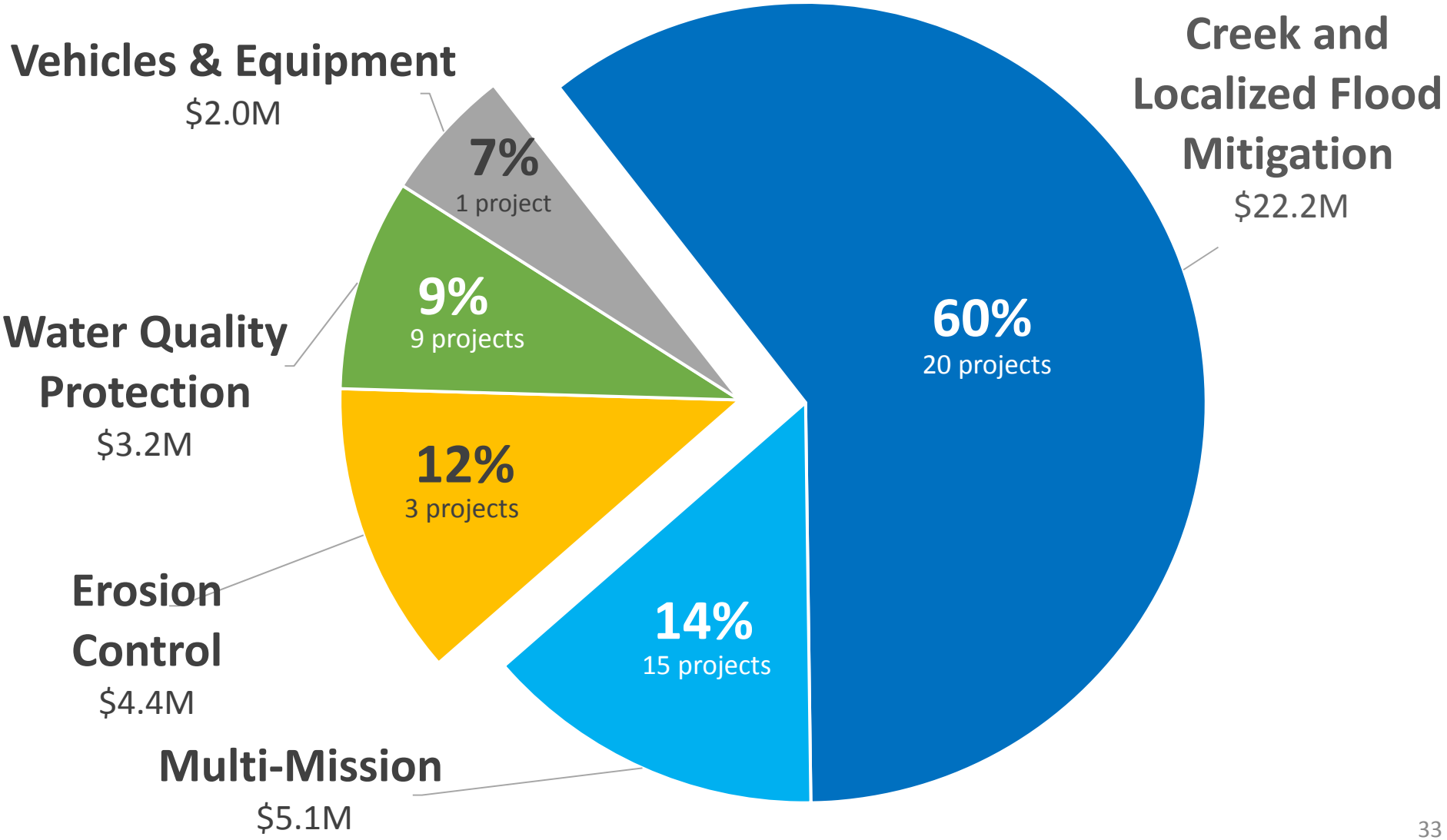


Scores available to the public: https://www.austintexas.gov/department/watershed-protection-master-plan

Capital Improvement Program

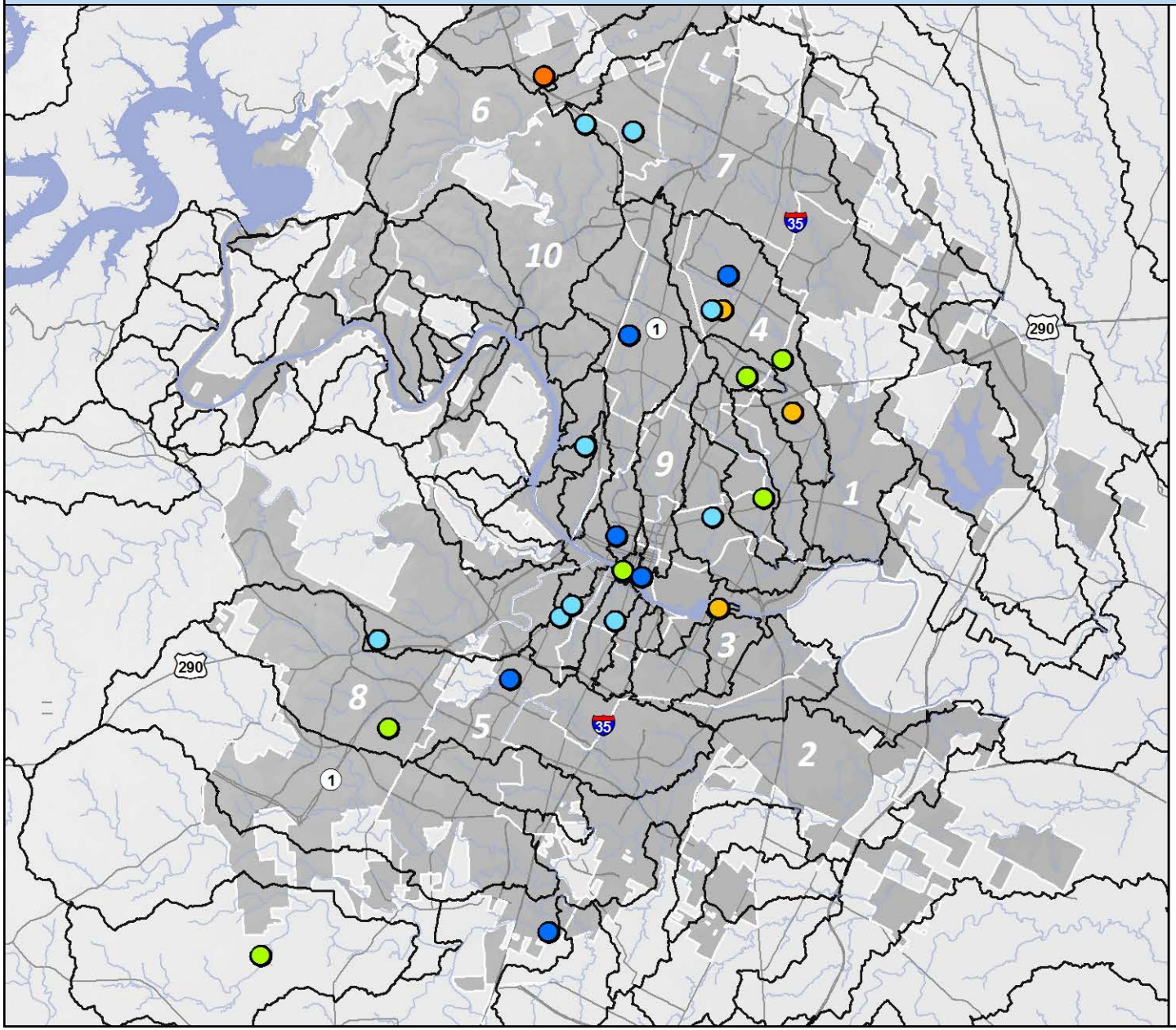


FY18 Proposed CIP Appropriations by Category



Total proposed FY18 appropriations: $36.9M

Map of CIP Projects Requesting FY18 Funding



FY18 Appropriation Project

- Localized Flood
- Creek Flood
- Erosion Control
- Multi-mission
- Water Quality Protection

Water Features

Watershed Boundaries

Council Districts

Streets

City of Austin
WATERSHED PROTECTION

0 1.5 3 6 Miles

This map has been produced by the Watershed Protection Department for the sole purpose of geographic reference. No warranty is made by theCity of Austin regarding specific accuracy or completeness.

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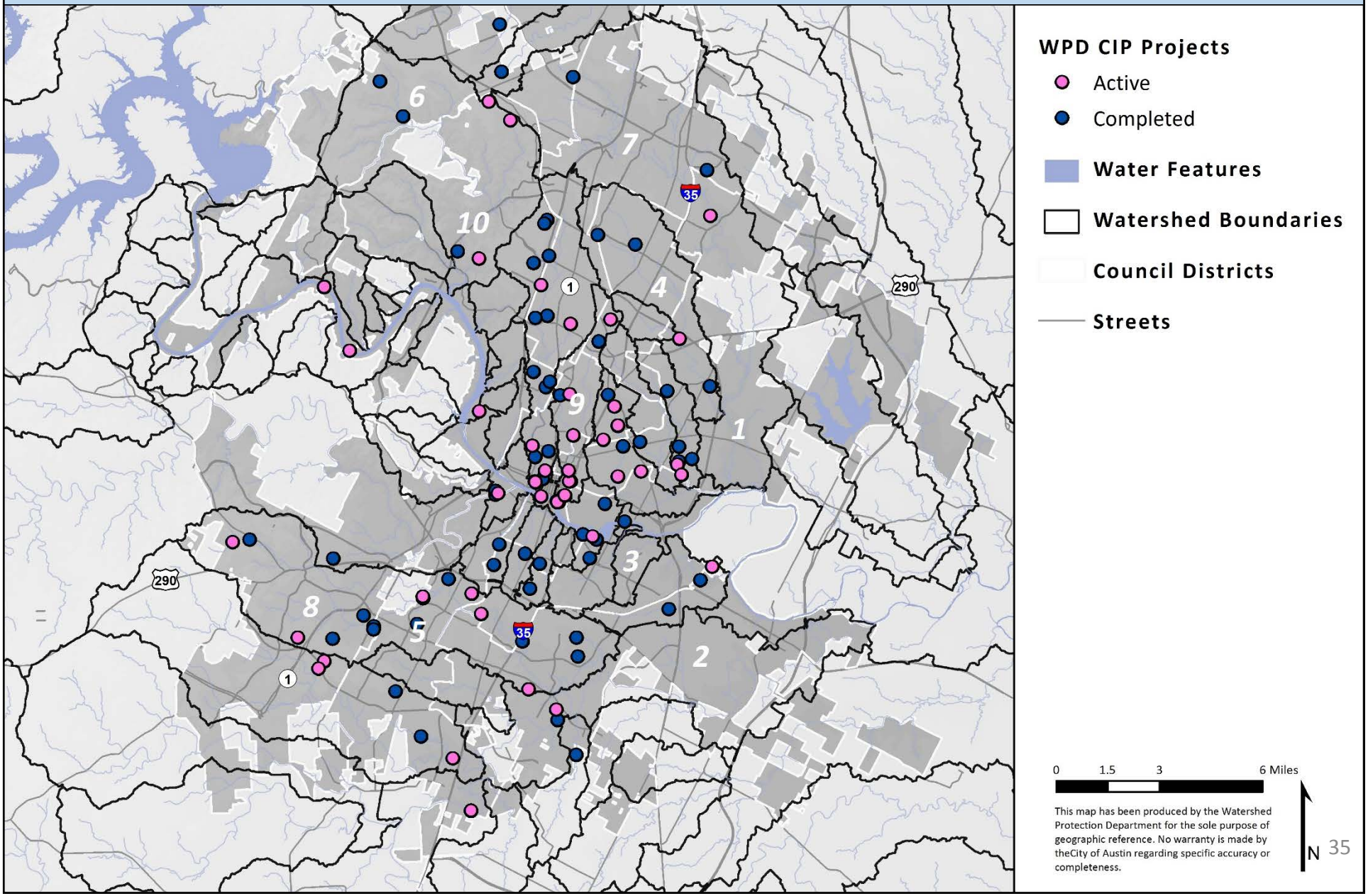
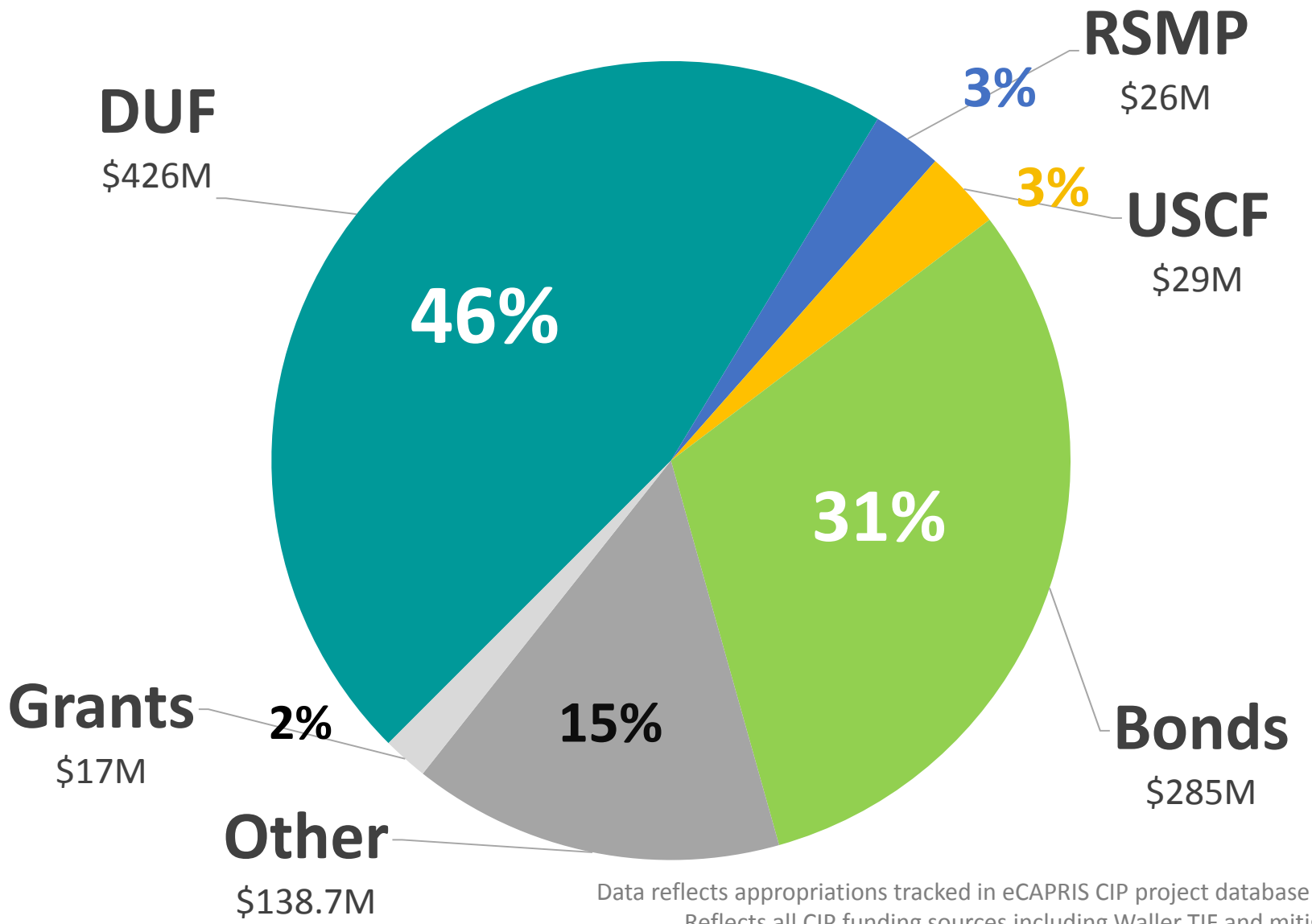
Active and Completed Capital Projects (2001 – Present)



CIP Appropriations by Funding Source
2001-present



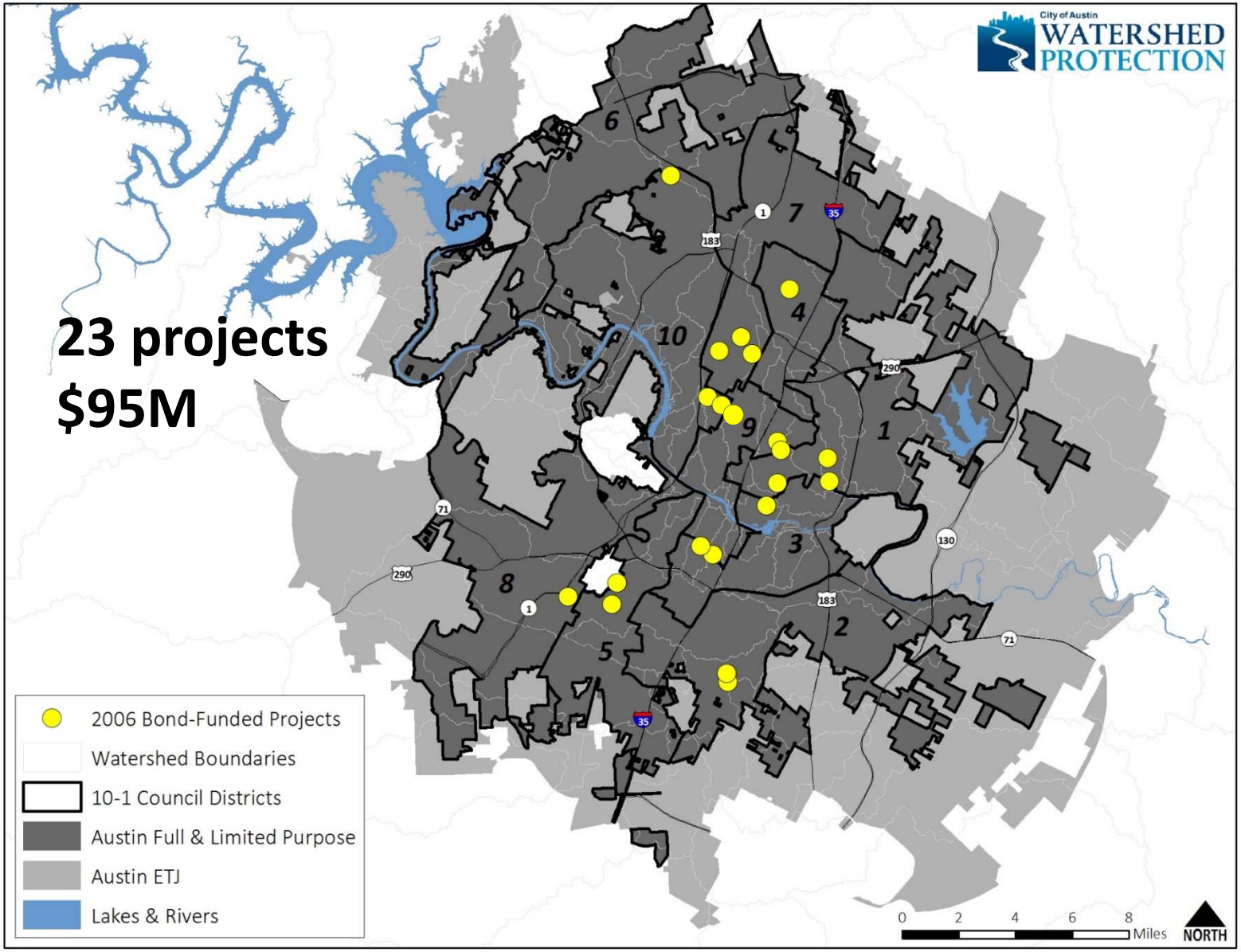
Data reflects appropriations tracked in eCAPRIS CIP project database since ~2001.
Reflects all CIP funding sources including Waller TIF and mitigation funds.

Bonds & Drainage Utility Funds

Bonds historically a significant source of WPD capital funding

- Drainage Utility Fee funds many solutions, but unable to keep pace with more frequent flood events, Austin's rapid growth, aging infrastructure
- Nearly $2 billion in long-range unfunded capital needs to address high-severity watershed problems
- Council's Flood Mitigation Task Force calls for bonds to close funding gap
- Last drainage bonds approved by Austin voters in 2006, provided $95 million towards 23 high-priority drainage projects

2006 Bond Program Drainage Projects

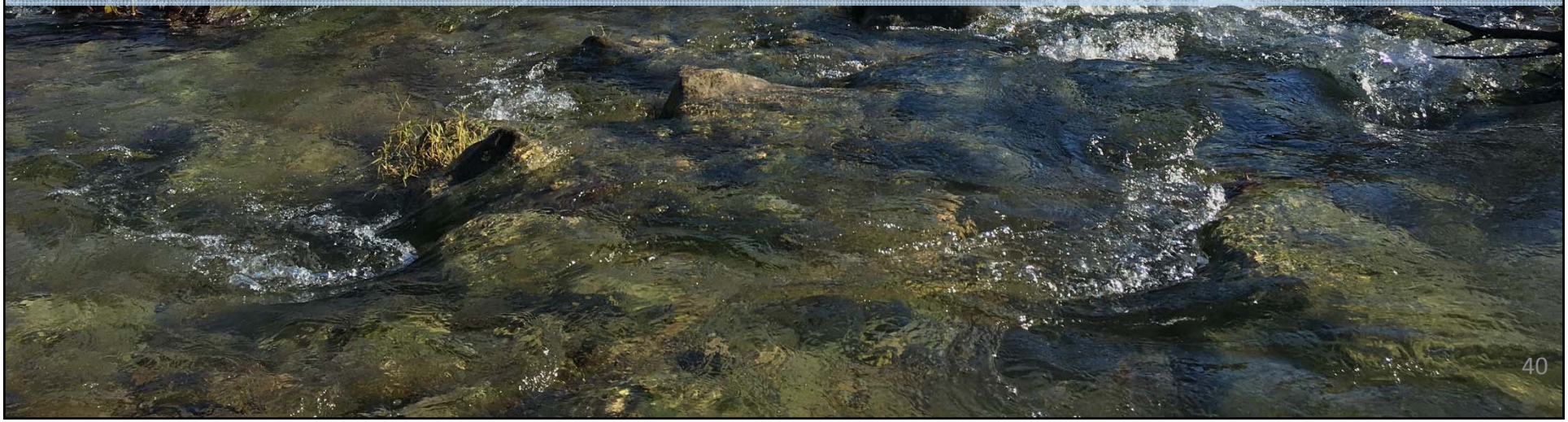


Linktoelection summary

2006 Bond Program Drainage Projects

Project Name	Category
Boggy Creek- 38 1/2 Street to MLK channel improvements and culvert upgrade	Creek Flood Mitigation
Williamson Creek Flood Hazard Mitigation and Ecosystem Restoration Corps	Creek Flood Mitigation
Little Walnut Creek - Flood Hazard Mitigation	Creek Flood Mitigation
Onion Creek - Flood Hazard Mitigation, Ecosystem Restoration, & Recreation	Creek Flood Mitigation (Buyout)
Onion Creek Floodplain Voluntary Home Buyout	Creek Flood Mitigation (Buyout)
Bayton Loop / Burrough Cove Buyout's	Creek Flood Mitigation (Buyout)
Bull Creek - Charing Cross Storm Drain Improvements	Localized Flood (Buyout)
Fort Branch Creek Reach 6&7 Channel Rehabilitation - Truelight and Eleanor	Multi-Objective Projects
Onion Creek - Dixie Drive Voluntary Home Buyouts	Multi-Objective Projects (Buyout)
Williamson Creek - Bannockburn Storm Drain Improvements	Storm Drain Improvements
Blunn Creek - Long Bow Storm Drain Improvements	Storm Drain Improvements
Shoal Creek - Allandale Storm Drain Improvements	Storm Drain Improvements
Shoal Creek - Ridgelea Storm Drain Improvements	Storm Drain Improvements
Lady Bird Lake -East 4th Street Storm Drain Improvements	Storm Drain Improvements
Shoal Creek Madison Storm Drain Improvements	Storm Drain Improvements
Shoal Creek Brentwood Storm Drain Improvements	Storm Drain Improvements
Williamson Creek Blarwood Storm Drain Improvements	Storm Drain Improvements
Fort Branch - Oak Lawn Subdivision Storm Drain Improvements	Storm Drain Improvements
East Bouldin - Euclid-Wilson Storm Drain Improvements	Storm Drain Improvements
Waller Creek - Guadalupe St, W. 35-37th Storm Drain Improvements	Storm Drain Improvements
Shoal Creek - Rosedale Storm Drain Improvements Phase 2	Storm Drain Improvements
Boggy Creek - Cherrywood Greenbelt Stream Restoration - Tied to 2231.128	Water Quality / Erosion
Boggy Creek Greenbelt -Reach B8 Stream Restoration	Water Quality / Erosion

2018 Bond Needs Assessment



Council Resolution calling for BEATF: Drainage & flooding elements

RESOLUTION NO. 20160811-031

WHEREAS, the City has initiated and completed several studies to identify city service needs, including but not limited to the Flood Mitigation Task Force Final Report, the Austin Housing Plan, the Austin Strategic Mobility Plan, the Project Connect Central Texas Regional High Capacity Transit Plan, the Long-Range Capital Improvement Program Strategic Plan, and Imagine Austin; and

WHEREAS, it is vital that the City allocate and prioritize funding that will address issues such as flooding, affordable housing, mobility, high capacity transit, parks, libraries, and the capital renewal necessary to rehabilitate the infrastructure already in place; and

Council Resolution calling for BEATF: Drainage & flooding elements

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

(A) A Bond Election Advisory Task Force (Task Force) is established to identify and prioritize bond funding for projects that will address infrastructure needs, including but not limited to needs related to flooding, libraries, housing, mobility, transit, parks, fire stations and other planned, unfunded capital improvement needs.

Link to Resolution

2018 Bond Needs Assessment: Stormwater

Goal: mitigate Austin's most severe flooding and erosion problems

- Example projects: storm drain improvements, low-water crossing upgrades, and erosion stabilization

Storm Drain Improvements

Low-Water Crossing Upgrade

Stream Restoration / Stabilization Project

Projected **Unfunded** Capital Solution Costs

FY17 Rolling Needs Assessment

Category	Unfunded Need
Creek Flood (Top 20*)	$ 418M
Localized Flood (Top 20*)	$ 161M
Water Quality	$ 150M
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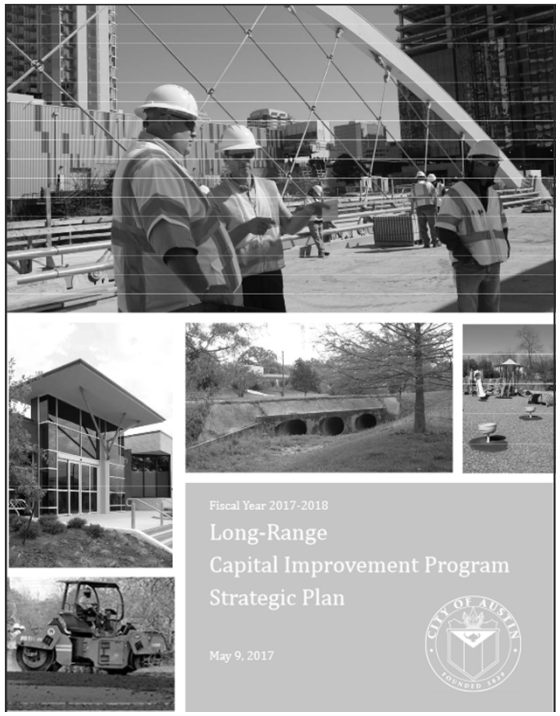


Estimated $1.94 Billion Total Unfunded Needs

*FY17 unfunded need reflects top 20 problem areas only – subset of much larger need.

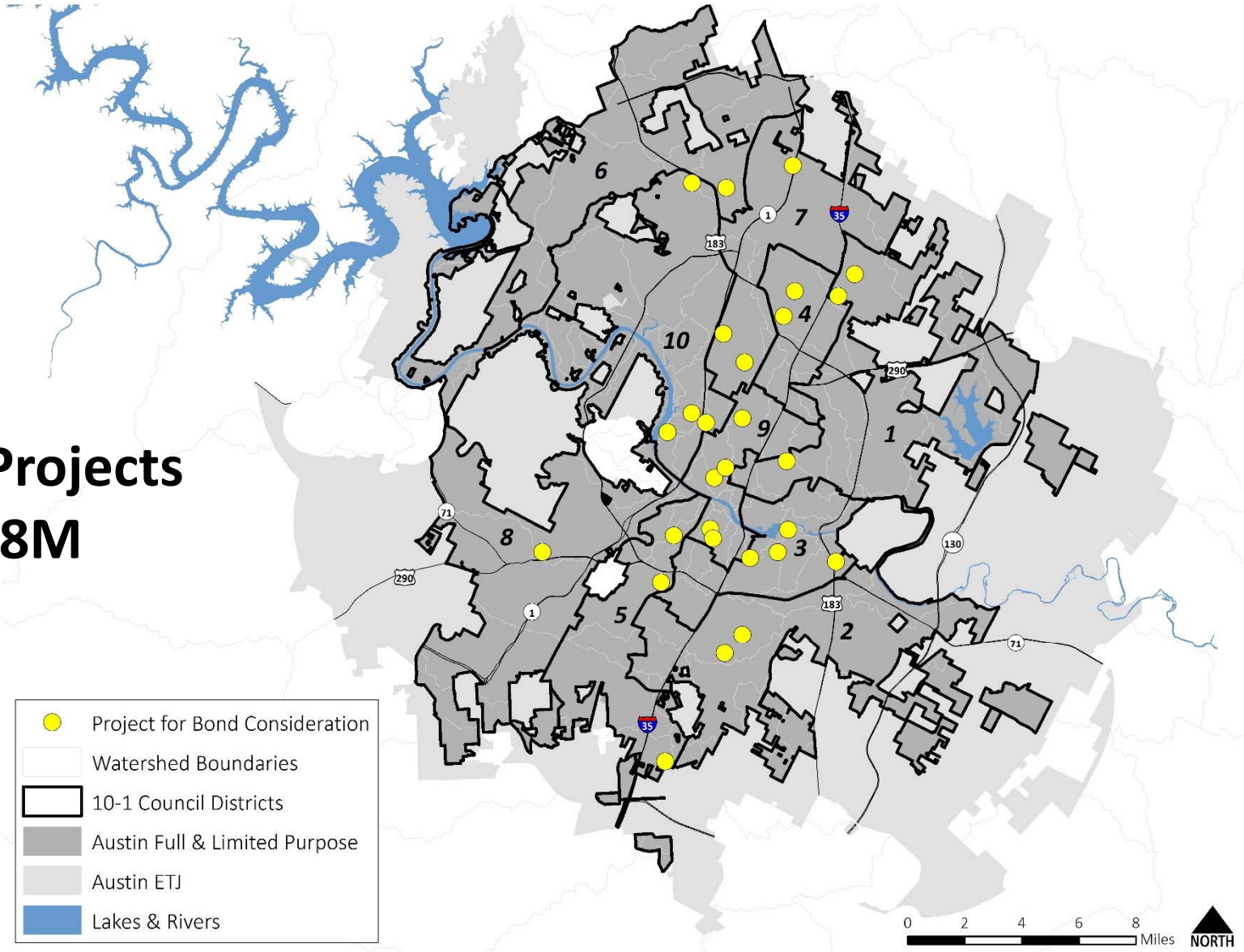
2018 Bond Stormwater Needs Assessment Prioritization

- WPD identified 28 high-priority capital projects for the proposed 2018 bonds, totaling over $230 million in unfunded need.
  - Subset of much larger identified unfunded need

- Identified and prioritized based on:
  - problem severity
  - implementation timing
  - partnership opportunities

2018 Bond Needs Assessment: Stormwater

28 Projects
$238M



Questions? Next Steps?

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