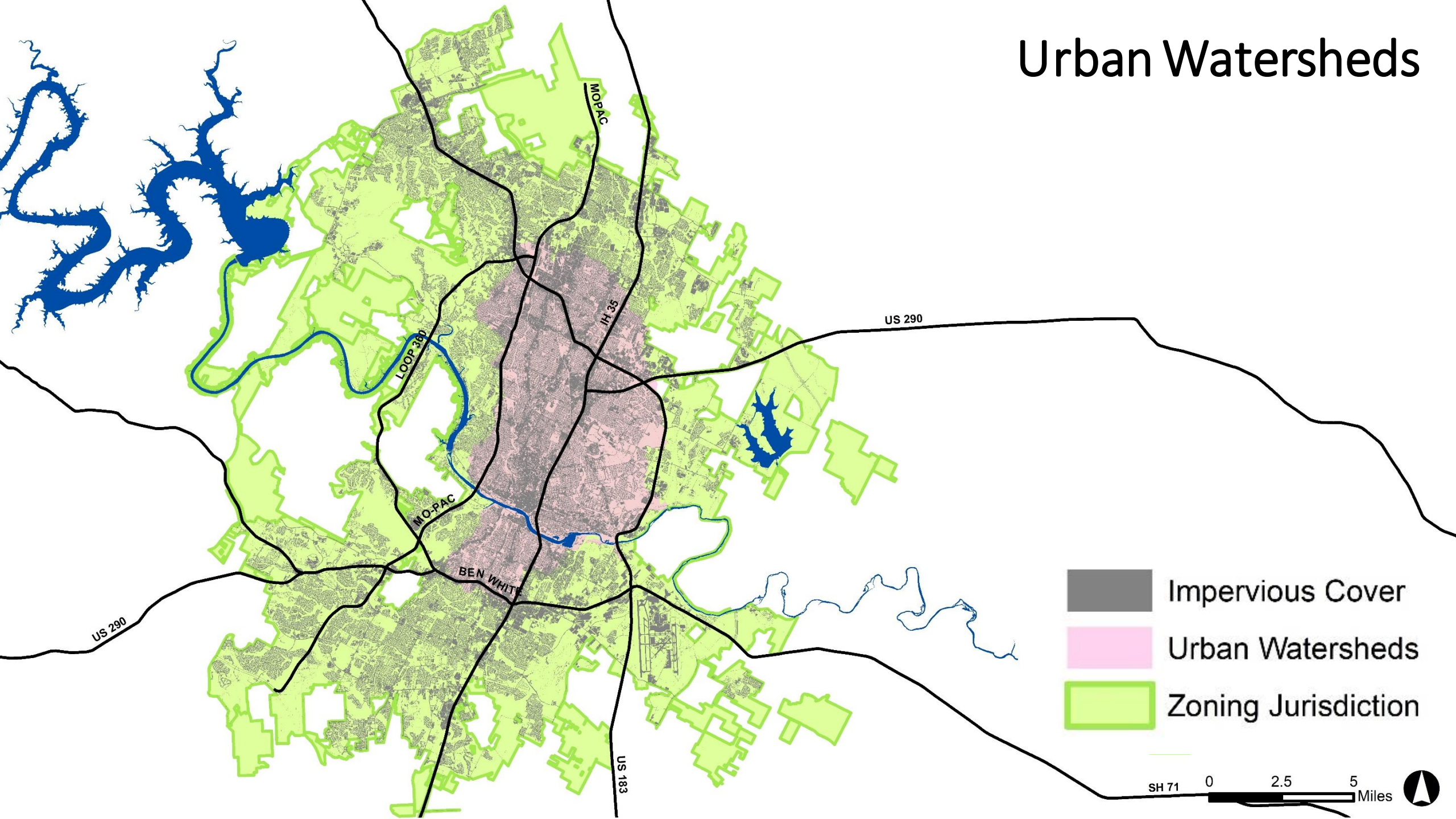


Urban Watersheds: Challenges and Solutions

Waller Creek Local Government Corporation
April 10, 2019 / June 10, 2020



Urban Watersheds



Urban watersheds were primarily developed before drainage and water quality regulations. Development in these areas is more likely to **lack stormwater controls**, be **highly impervious**, **encroach on waterways**, and have **undersized infrastructure**.

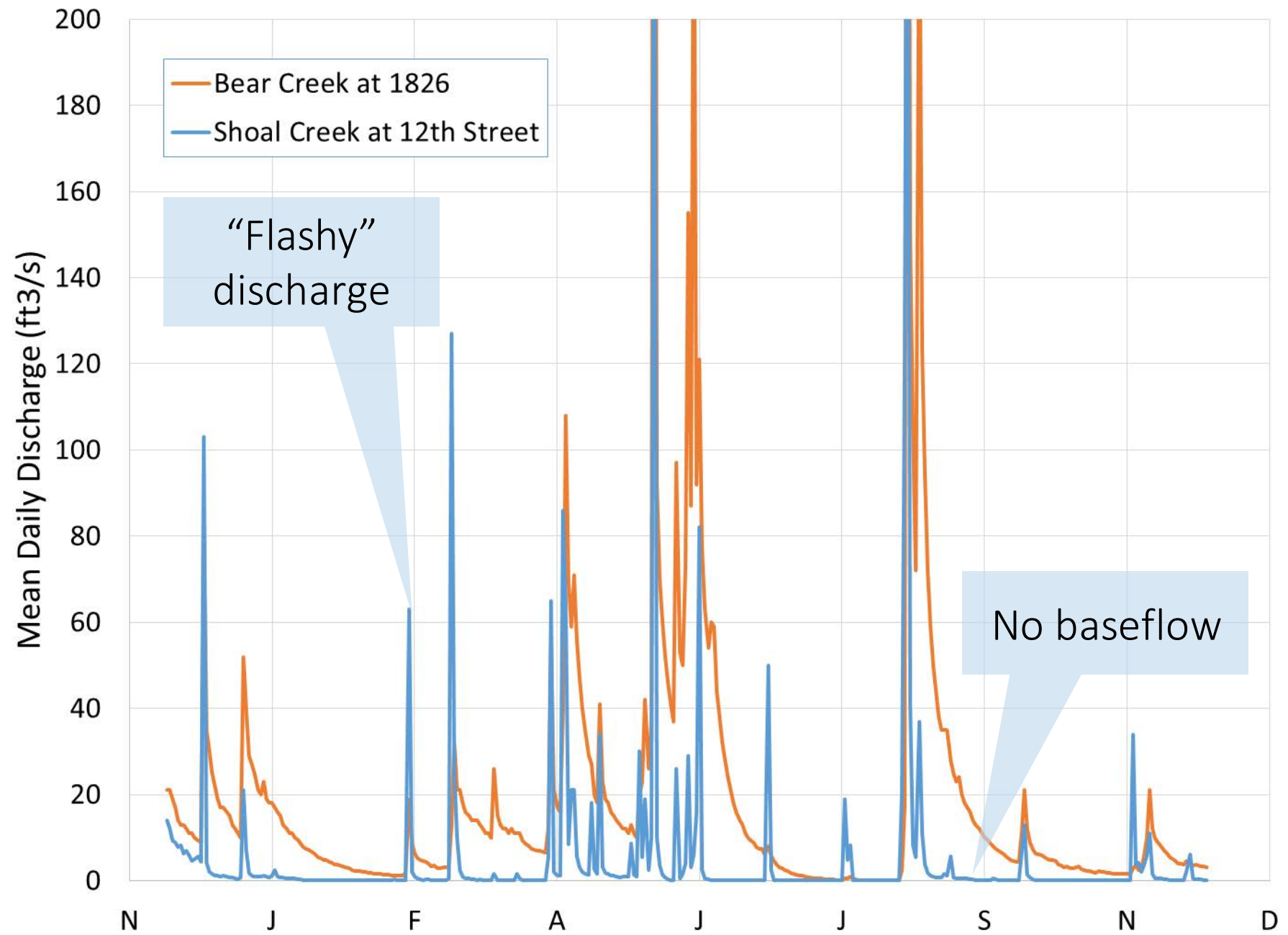


Waller Creek (pre-1950)

- Some areas inhabited by permanent settlers since the early 1800s
- Mostly developed prior to water quality and drainage regulations
- 48% impervious cover (versus 14% for non-urban watersheds)



Urban Stream Syndrome

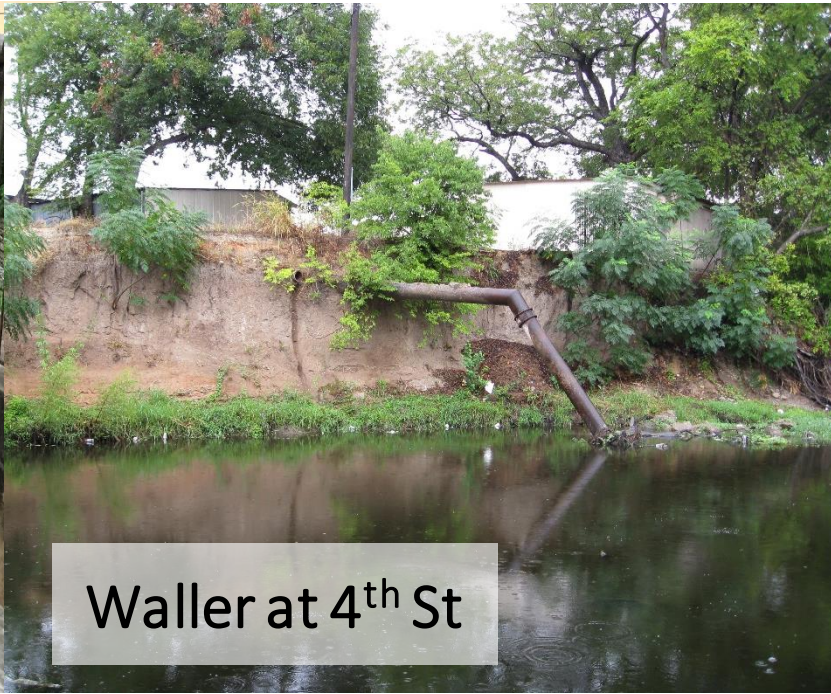


Symptoms of Urban Stream Syndrome



Waller at 6th St

Flooding



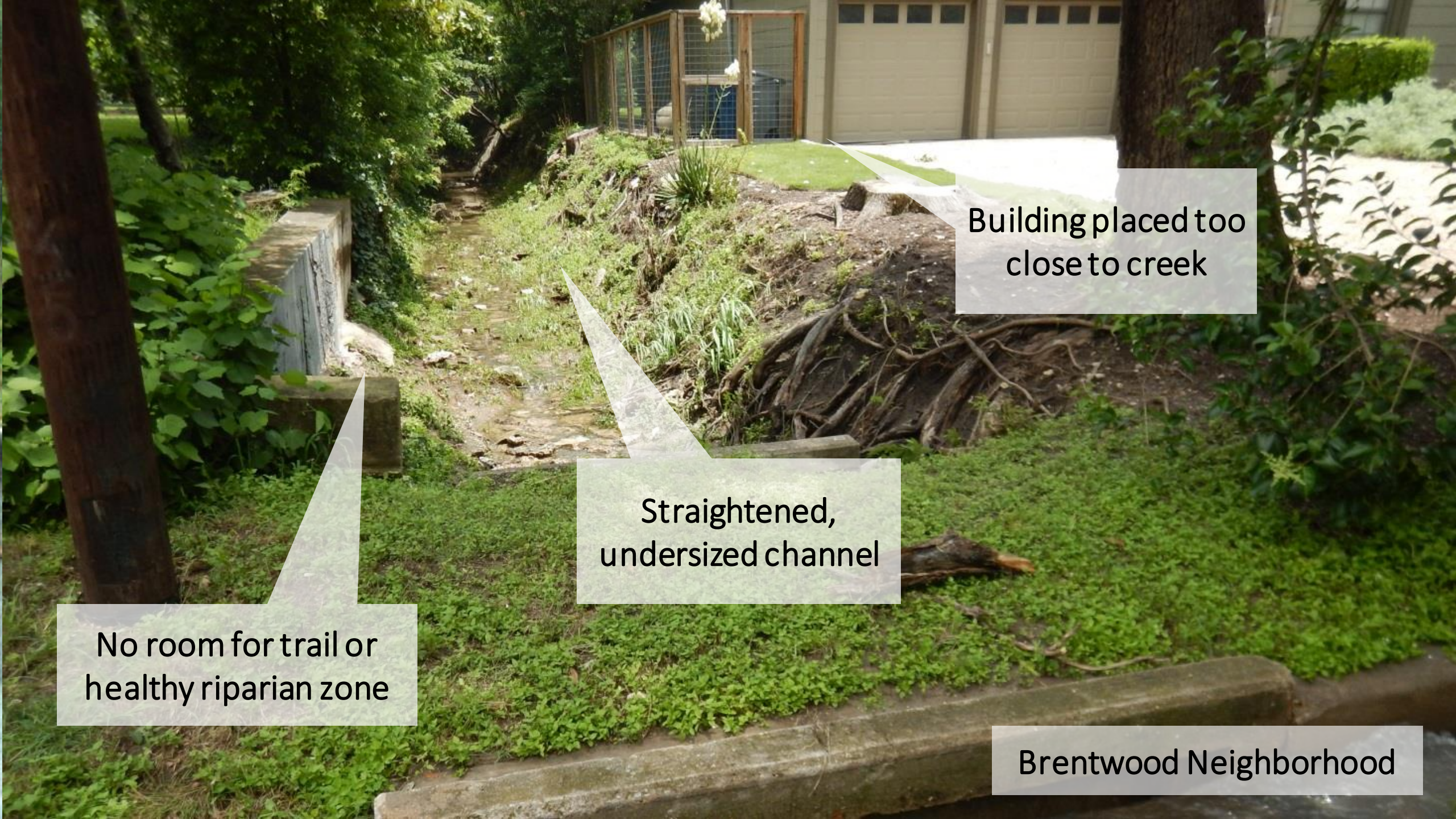
Waller at 4th St

Erosion



Sediment in Lady Bird Lake

Water Quality Degradation



Building placed too close to creek

Straightened, undersized channel

No room for trail or healthy riparian zone

Brentwood Neighborhood



Brentwood Neighborhood

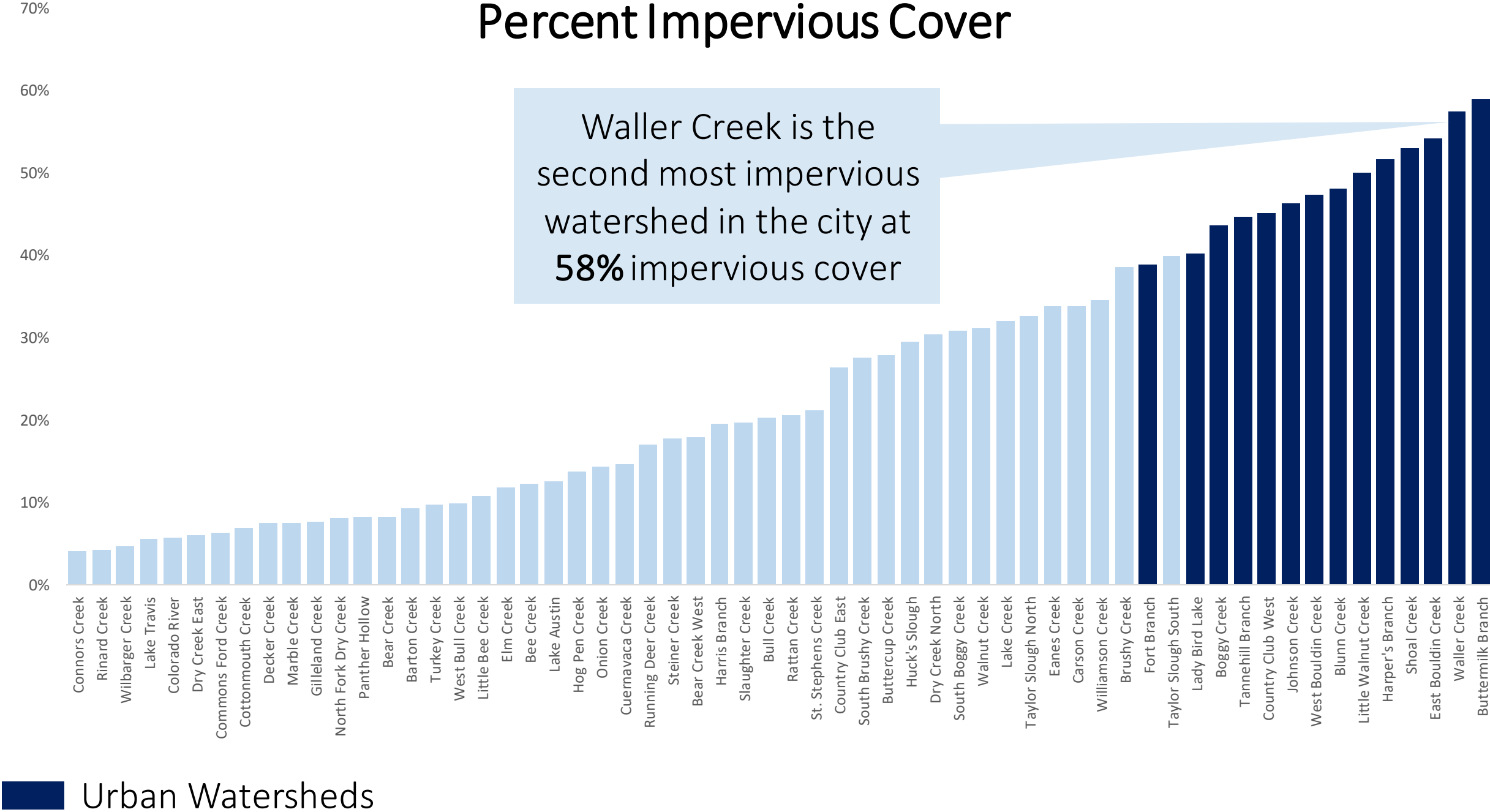


Shoal Creek, Memorial Day 2015



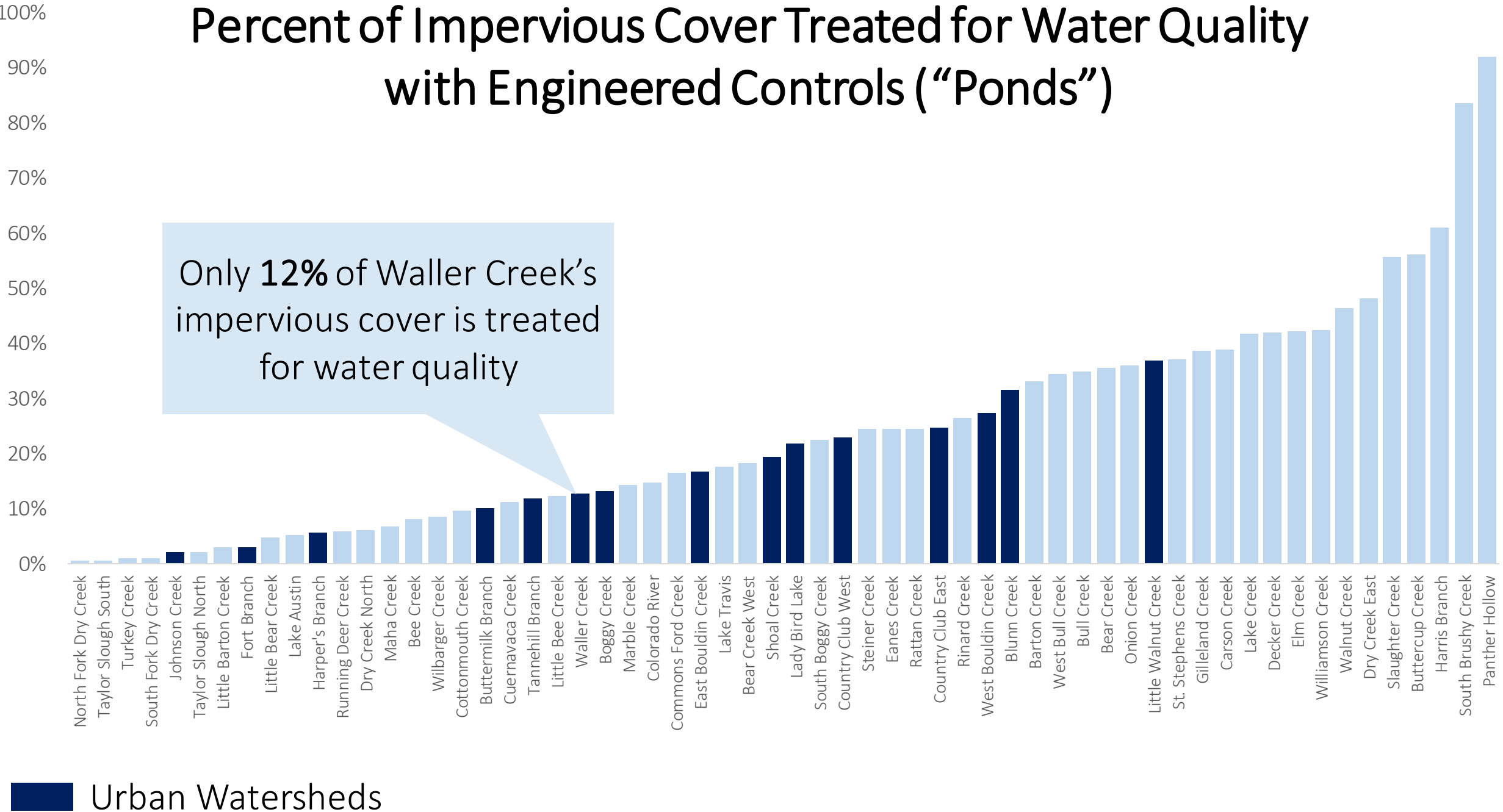
Shoal Creek, Memorial Day 2015

Percent Impervious Cover

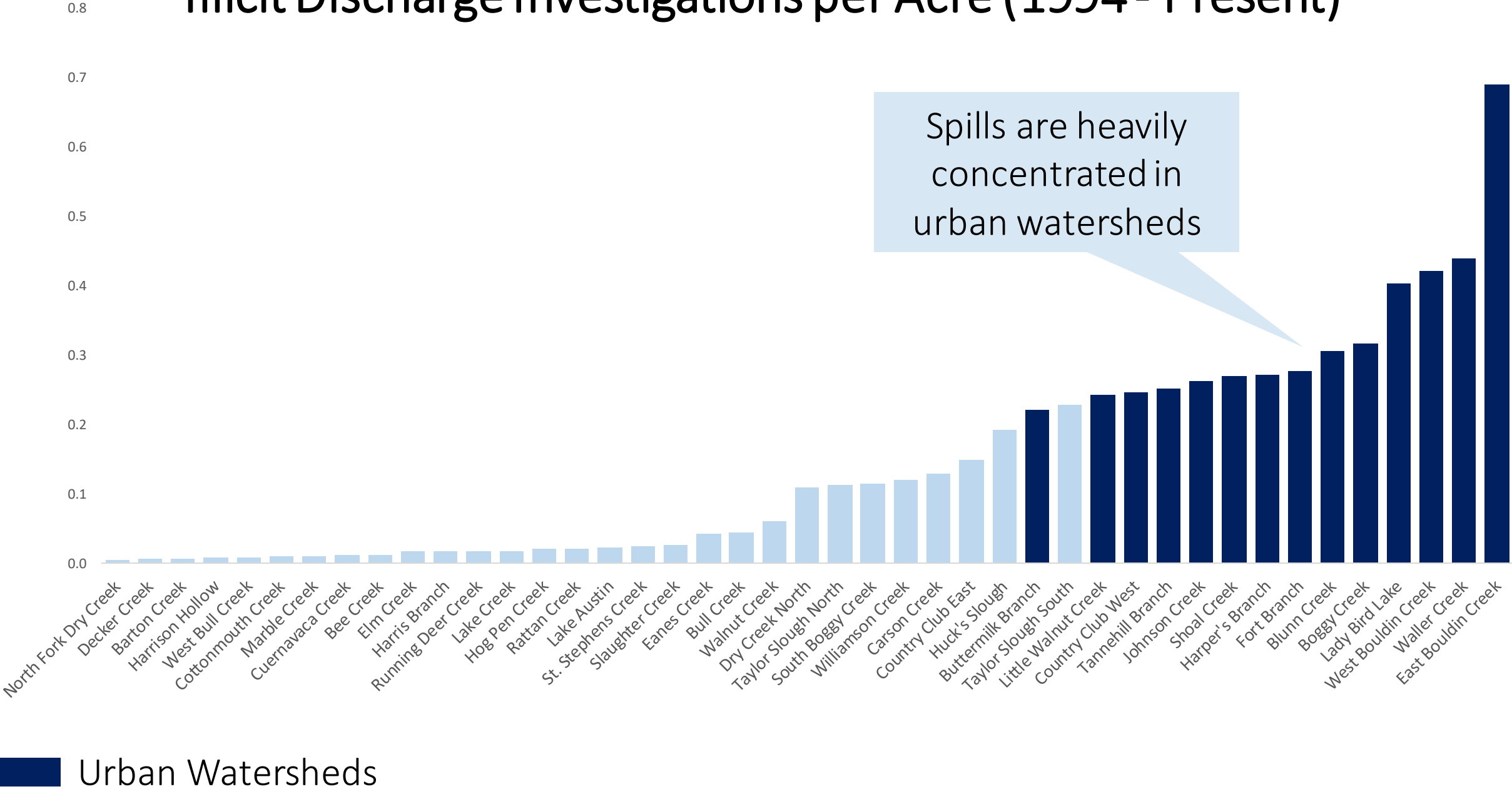


Percent of Impervious Cover Treated for Water Quality with Engineered Controls (“Ponds”)

Only **12%** of Waller Creek’s impervious cover is treated for water quality



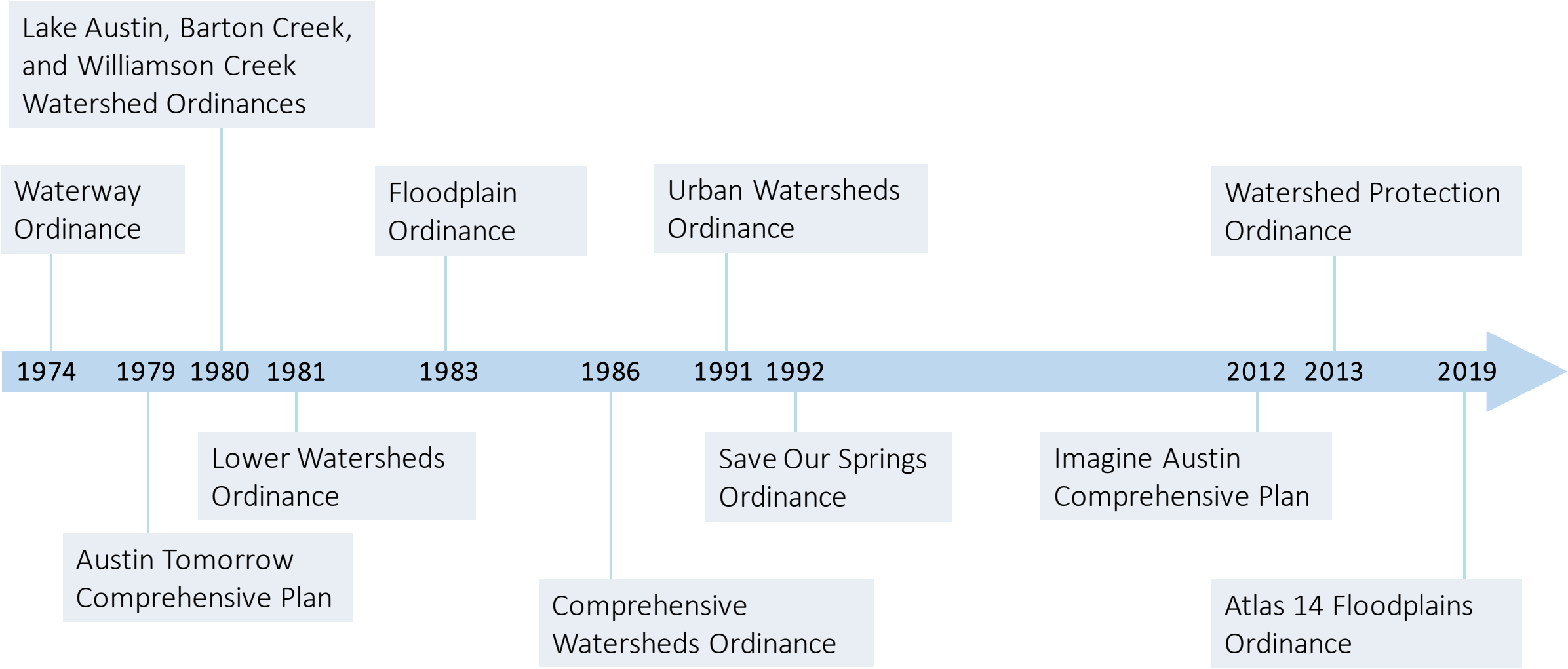
Illicit Discharge Investigations per Acre (1994 - Present)



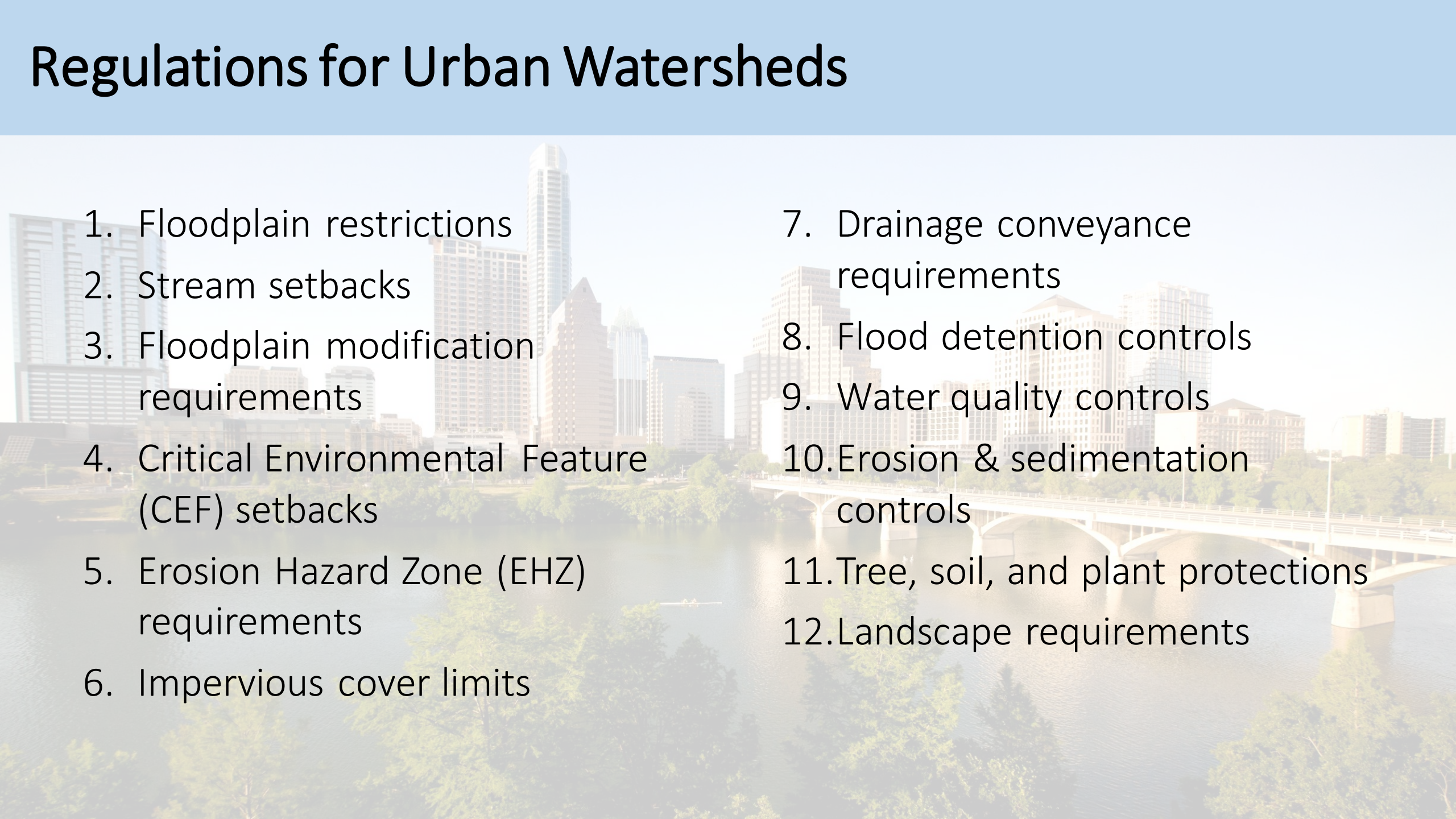
Solutions to Urban Watershed Challenges

- Regulations
- Programs
- Capital Improvement Projects (CIP)
- Public-Private Partnerships

Regulations prevent problems before they occur.



Regulations for Urban Watersheds

- 
- The background of the slide features a faded, high-angle photograph of an urban landscape. In the foreground, a wide river flows, with a multi-arched bridge crossing it. The far bank is lined with lush green trees. In the background, a dense city skyline is visible, featuring several tall skyscrapers and other urban buildings under a clear sky.
1. Floodplain restrictions
 2. Stream setbacks
 3. Floodplain modification requirements
 4. Critical Environmental Feature (CEF) setbacks
 5. Erosion Hazard Zone (EHZ) requirements
 6. Impervious cover limits
 7. Drainage conveyance requirements
 8. Flood detention controls
 9. Water quality controls
 10. Erosion & sedimentation controls
 11. Tree, soil, and plant protections
 12. Landscape requirements

Avoid building in harm's way.

community space

floodplain

health and safety

Cherry Creek

Provide healthy riparian zones to slow and filter runoff.

**riparian
zone**

**wildlife
habitat**

trail





Give creeks room to move and change.

Give creeks room to move and change.



Give creeks room to move and change.



Programs provide ongoing maintenance, monitoring, response, education, and planning.





Vactor truck clearing an inlet



24-Hour Spills Response



Stormwater Discharge Permit Program

Capital improvement projects address the most severe watershed problems.

Example project types: storm drain improvements, low-water crossing upgrades, diversion tunnels, and stream bank stabilization



**Storm Drain
Improvements**



**Low-Water Crossing
Upgrade**



**Stream Restoration /
Stabilization Project**

2019: Green Stormwater Infrastructure
Retrofit/Demonstration Project

- 5 Rain Gardens
- 13 Rainwater Harvesting Cisterns

Waller Creek Watershed

Reilly
Elementary
School

Denson Dr

Waller Creek

2000: Regional Flood
Detention Retrofit

2014: Regional Water
Quality Retrofit

Reilly Elementary Flood Detention Retrofit



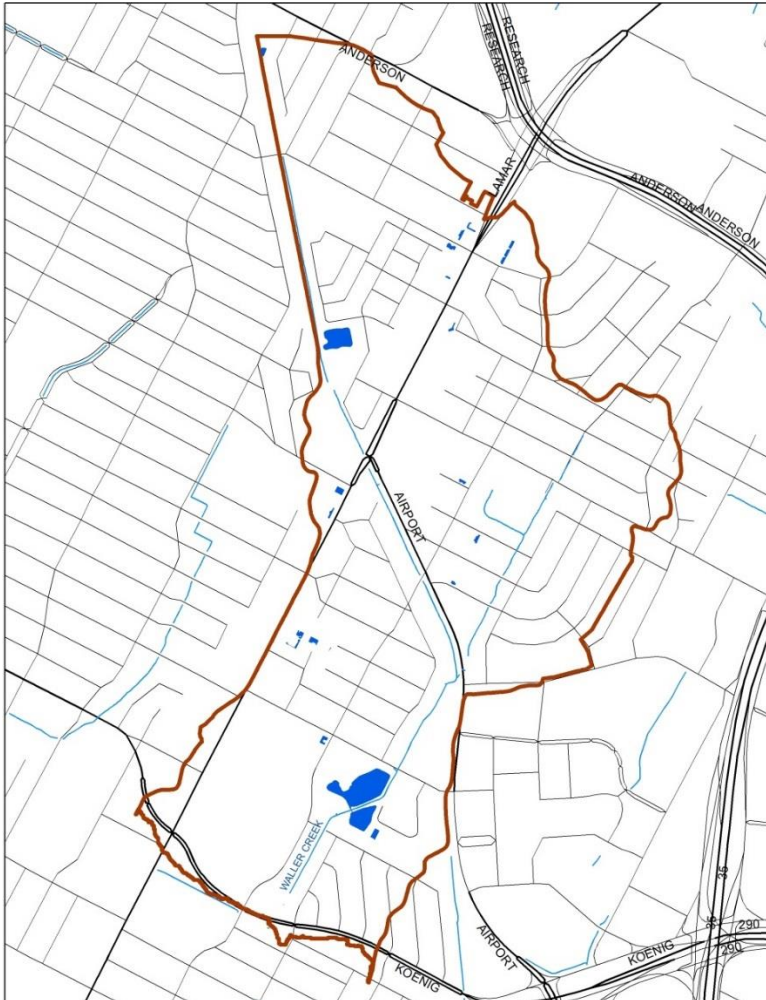
Reilly Elementary Water Quality Retrofit



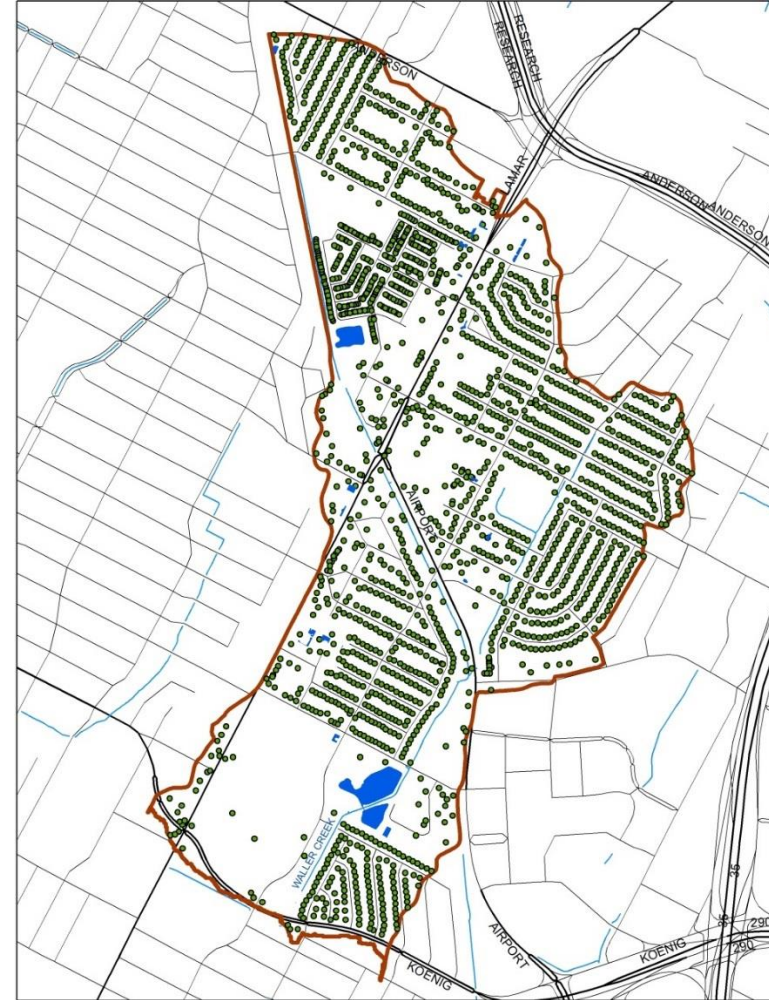
Water quality retrofit of
existing detention pond

“Raincatcher” Initiative: Headwaters of Waller Creek

Existing Regional Controls



Potential Distributed + Regional Controls



Reilly Elementary GSI demonstration project



GSI = Green Stormwater Infrastructure

Reilly Elementary GSI demonstration project



Reilly Elementary GSI demonstration project



Raincatcher Incentive Pilot Program: 25 homes, later 1,200



Rain tank installation



Rain garden prep

Public-private partnerships

- 
- The background image shows a large-scale construction project in an urban setting. In the foreground, a large, circular concrete structure, likely a tunnel entrance or a large water feature, is under construction. It has a curved, modern design with a glass-enclosed upper section. To the right of this structure, there is a large area of dirt and construction materials, including stacks of pipes and concrete segments. In the background, a dense city skyline is visible, with various high-rise buildings and a mix of greenery. The sky is clear and blue.
- Austin's residents
 - Waterloo Greenway Conservancy
 - Shoal Creek Conservancy
 - Keep Austin Beautiful
 - TxDOT
 - Private Development

Waller Tunnel and District Improvements

Public-private partnerships



- Austin's residents
- Waterloo Greenway Conservancy
- Shoal Creek Conservancy
- Keep Austin Beautiful
- TxDOT
- Private Development

Shoal Creek Conservancy Work Day

For More Information

1. [Council District profiles](#)
2. [North Urban watersheds profiles](#)
3. [Watershed Protection Master Plan](#) and [problem score viewer](#)
4. [FloodPro](#) website
5. [ATXFloods](#) website
6. [Pollution Hotline](#) (512-974-2550; 24 hours)
7. [Austin 3-1-1](#) / Mobile App

Questions?

Matt Hollon, Planning Manager
Watershed Protection Department
City of Austin
(512) 974-2212
Matt.Hollon@austintexas.gov