The Austin Approach to Recharge Zone & Groundwater Protection

2016 New Partners for Smart Growth Conference
“What Water Agencies Are Afraid to Tell Land-Use Decision-Makers”

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City of Austin, Texas
Presentation Overview

- Austin Context & Challenges
- Regulatory Protections
- Capital: structural control retrofits & land acquisition
- Programs
- Regional Cooperation
- Resiliency
Austin’s Setting

- Edge of Texas Hill Country
- Situated Along Balcones Fault
- Presence of Karst Aquifer
- Riverine Lake System
- Numerous Creeks
- Barton Springs
Austin’s Icons

- Barton Springs Pool ("the Soul of the City")
- McKinney Falls
- Lake Austin, Lady Bird Lake, and the Colorado River
Austin’s Growth

- Austin is the 11th largest city in the U.S.
- Fastest growing city in the U.S. (Forbes 2014)
- Current* population
  - 910,833 people within the city
  - 2.0 million in the greater Austin area

* Oct. 2015: https://www.austintexas.gov/demographics
Citizen Involvement

- Austin is a highly aware & educated community
- Austin is a politically & socially active community
Goals of Our Regulations

• Preserve and Restore Natural Function
• Protect Sensitive Resources
• Minimize Site Disturbance
• Manage Stormwater Runoff
History of Our Regulations

1974  Creeks Ordinance

1980  Lake Austin Watershed Ordinance
       Barton Creek Watershed Ordinance
       Williamson Creek Watershed Ordinance

1981  Lower Watersheds Ordinance
       (Slaughter, Onion, Bear, and Little Bear Creeks)

1982  Landscape Ordinance
History of Our Regulations

1983  Protected Tree Ordinance
1986  Comprehensive Watersheds Ordinance
1991  Urban Watersheds Ordinance
1992  Save Our Springs (SOS) Ordinance
2010  Heritage Tree Ordinance
2013  Watershed Protection Ordinance
Barton Springs Zone (BSZ)
Save Our Springs (SOS) Ordinance

- Passed by Citizen referendum 1992
- Strict impervious cover limits
- “Non-degradation” structural water quality (WQ) controls
- Stream setbacks
- No variances—Council amendments only
- “Supermajority” Council votes to amend
- Call for structural WQ retrofits
- Successfully defended in courts
Impervious Cover, Runoff, & Baseflow

Barrett, Quenzer, & Maidment (1998)

- 10% Runoff at 15% Impervious Cover
- 70% Runoff at 80% Impervious Cover
Impacts of Impervious Cover
Schueler, 1992

Stream Quality
- Good
- Fair
- Poor

Watershed Impervious Cover
- West Bull
- Bull
- Walnut
- Shoal

Sensitive
good
impacted
non-supporting
urban drainage

10%
25%
40%
60%
100%
Impervious Cover

• Impervious cover is any surface that prevents infiltration of water into the ground, such as roads, parking lots, & buildings

• Limits placed on impervious cover vary by land use & watershed
Impervious Cover

- Limits vary by area of town and land use
- Higher imperv. cover limits in Urban & Suburban
- More restrictive for Water Supply watersheds & Barton Springs Zone

Protect Austin’s natural resources and environmental systems by limiting land use and transportation development in sensitive environmental areas and preserving areas of open space (Imagine Austin Comprehensive Plan, LUT P22)
Stream & Erosion Hazard Setbacks

• Setbacks from creeks prohibit development except for low-impact uses like parks and trails

• Erosion hazard zone keeps resources from being threatened by future stream erosion
Critical Environmental Features

• Setbacks protect sensitive features from development & preserve in a more natural state

• Features include bluffs, canyon rimrocks, caves, sinkholes, springs, & wetlands
Tree Protections

• Requirements are designed to achieve a balance of re-forestation and preservation
  – Protected & heritage trees
  – Mitigation requirements
Steep Slopes

- Limitations on construction for steeper areas of the site (greater than 15 percent)
- Stabilize and revegetate disturbed slopes
Cut and Fill Limits

• Cut and fill for site grading is limited to 4 feet, with exceptions (e.g. foundations, right-of-way)
Erosion & Sedimentation Controls

- Also known as construction-phase controls
- Required for all development until permanent revegetation has been established
Structural Stormwater Controls

• Water Quality Control
  – Capture and treat a required volume for the site
  – Non-degradation for the Barton Springs Zone

• Flood Mitigation
  – Match peak flow rates to predevelopment
Structural Water Quality Retrofits
Water Quality Protection
Land Acquisition Program
Acquisition Criteria

- Creek and Aquifer Protection
- Avoided Pollution – Prevention of Development
- Contiguity
- Management Considerations
- Public Use Value (2006)
- Financial Feasibility
History: Acquisition

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<th>Date</th>
<th>Amount</th>
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<td>May 1998</td>
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Partnership Contributions: $24M

Conservation Easements: (17,513 ac.) 62%
Fee Simple Acquisition: (10,841 ac.) 38%
Water Quality Protection Lands

2006 Bonds

Barton Creek Venture
Fee Simple
14 acres
$3,550,000
$1,900,000 BCP
$50,000 AWU

AARAL
Fee Simple
49 acres
$634,600
$230,400 AISD

Historic Gibson
Conservation Easement
498 acres
$562,500
$462,500 HCC
$1,975,000 NRCS

North Hays
Conservation Easement
1,558 acres
$11,089,475
$410,525 BSZ Mitigation

Lower Aña
Fee Simple
612 acres
$1,000,000
$25,000 AISD

North Hays
Fee Simple
1,500 acres
$25,000,000

North Hays
Conservation Easement
2,254 acres
$1,000,000
$4,900,000 Hays Co.
$4,000,000 NRCS

Dahlstrom
Conservation Easement
2,254 acres
$1,000,000
$4,900,000 Hays Co.
$4,000,000 NRCS

Water Quality Protection Lands
Fee Simple
Conservation Easement
2006 Bond Acquisitions
Other Open Space & Parkland
Parcels
Recharge Zone
City of Austin Jurisdiction

31
North Aña
Fee Simple
86 acres
$1,350,000

Slaughter 100
Fee Simple
49 acres
$500,000

Hudson
Fee Simple
607 acres
$18,000,000

Ruby Ranch
Conservation Easement
732 acres
$2,000,000
$2,990,000 NRCS

Searcy
Fee Simple
352 acres
$7,500,000

Water Quality Protection Lands
2012 Bonds
Land Acquisition Benefits

- 24.5% of the Barton Springs recharge zone is protected as Water Quality Protection Land
- An additional 6% is protected as Balcones Canyonlands Preserve or parkland
- Includes 100’s of significant karst features
- Miles of creeks recharging the aquifer
Programs

• Monitoring
• Wastewater management
• Public education
• Development review and inspection
• Infrastructure inspection & maintenance
• Master planning & evaluation
• Many, many others!
Regulatory Authority

- Austin is a home rule city
  - Corporate limits (full & limited)
  - Planning jurisdiction (5 mile ETJ)

- Regulatory Authority
  - Texas Local Government Code
  - Texas Water Code

- State Law Limitations
  - Vesting Statute ("Grandfathering")
  - Takings Statute
2005 BSZ Regional Water Quality Protection Plan

- Multiple regional participants
- Best science
- Acknowledges regional solution essential
- Flexible, ongoing implementation
Challenges & Opportunities: Connecting the Dots...

1. Can incorporate natural systems & rainwater storage in designs to offset water use, preserve quality of life
2. Practical methods & models have already been implemented in other cities
Summary

• Recharge enhancement and protection of sensitive lands is difficult but critical

• Need a variety of solutions: regulations, programs, capital projects, regional cooperation

• Need resilient approach for extreme weather
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