LOW IMPACT DEVELOPMENT

LID IN REGION 6

AUSTIN, TEXAS

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Introduction
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"Suburban" has 78% of Austin’s undeveloped land.
Austin’s Watershed Protection History: Landmark Events

- Waterway Ordinance 1974
- Interim Lake Austin Watershed Ordinance 1980 IC Limits
  - Barton Creek Watershed Ordinance 1980 CWQZ
  - Williamson Creek Watershed Ordinance 1980 WQ Controls
- Comprehensive Watershed Ordinance 1986
  - Urban Watershed Ordinance 1991
  - SOS Ordinance 1992
  - 1/2” Plus Water Quality Control Sizing 1993 WQ Volume
- Redevelopment Exception 2000
- BSZ Redevelopment Exception 2007
- Watershed Protection Ordinance Resolution 2011

- 1970: Endangered Species Act
- 1975: Drainage Criteria Manual
- 1980: Landscape Ordinance
- 1980: Austin Tomorrow Comprehensive Plan
- 1985: Septic Tank Ordinance
- 1985: Tree Ordinance
- 1990: Amendments to Federal Clean Water Act
- 1995: Smart Growth
- 2000: Watershed Protection Master Plan
- 2005: HB 1704
- 2010: Imagine Austin Comprehensive Plan
- 2015: Commercial Landscape Ordinance
Criteria and Code References

- Erosion Control 25-7-61
- Impervious Cover Limits 25-8 by Watershed Classification
- Non Degredation for SOS 25-8-514 Article 12
- Water Quality Controls 25-8-211/213
- Detention Requirements 1.2.2
- Erosion Control 1.6.7
- Green Stormwater Controls 1.6.7
Council Resolution

1. Creek Protection
2. Floodplain Protection
3. Development Patterns & Greenways
4. Improved Stormwater Controls
5. Mitigation Options
6. Simplify Regulations & Maintain Opportunity
7. Coordinate with Regional Partners

(Resolution #20110113-038)
Stakeholder Meetings

1. Series of stakeholder workshops
2. Worked through the various Codes
3. COA staff presentation
4. Open discussions
5. Inclusive
6. Add new methods  (the 2nd mouse gets the cheese)
7. Modify existing methods
8. Streamline the procedures (delete some items)
LID Competition - CTRMA

“Green Mobility Challenge” – US 290 West – “The Oak Hill Y”
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(Resolution #20110113-038)
Creek Protection: Ordinance Proposal

• Extend minor “headwaters” stream buffers to 64 acres of drainage citywide

• To offset impacts in Suburban Watersheds:
  – Eliminate Water Quality Transition Zone (WQTZ)
  – Use Gross Site Area basis for impervious cover
  – Allow “buffer averaging” to reduce the width of buffers
Current System - Suburban

- **Major**: > 1,280 acres
- **Intermediate**: 640 – 1,280 acres
- **Minor**: 320 – 640 acres
Proposed System

Major: 640 – 1,280 acres
Intermediate: 320 – 640 acres
Minor: 64 – 320 acres
Striking a Balance

Watershed Health Ability to Develop

69% Impervious Cover

Net Site Area
Headwaters Buffer

Watershed Health Ability to Develop
Striking a Balance

Watershed Health

Ability to Develop

80% Impervious Cover

Net Site Area
Headwaters Buffer

Gross Site Area
Remove WQTZ
Creek Protection: Ordinance Proposal

• **Revise allowed uses** in the Critical Water Quality Zone:
  – Roadway crossings for centers & corridors
  – Trails
  – Urban agriculture / community gardens
  – Utility lines (wastewater, gas, cable, etc.)
  – Green water quality controls
  – Athletic fields
Stream Buffer Profile

Critical Water Quality Zone
Creek Protection: Ordinance Proposal

• Require **Erosion Hazard Zone (EHZ)** protections
  – No improvements (including utility lines) are allowed within the erosion hazard zone **unless protective works are provided**
  – Development must not result in additional erosion impacts to other properties
Erosion Hazard Zone

Property in jeopardy

Wastewater line exposed within creek bed

EHZ
1. Creek Protection

2. **Floodplain Protection**

3. Development Patterns & Greenways

4. Improved Stormwater Controls

5. Mitigation Options

6. Simplify Regulations & Maintain Opportunity

7. Coordinate with Regional Partners

*(Resolution #20110113-038)*
Floodplain Protection: Ordinance Proposal

- Restrict floodplain modifications
- Functional assessment of floodplain health
- Design for future healthy riparian vegetation
- Require restoration
- Provide off-site mitigation options
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(Resolution #20110113-038)
Improved Stormwater Controls: Ordinance Proposal

• Adjust threshold for requiring water quality controls (5,000 square feet of impervious cover)
• Allow “stacking” of water quality and flood controls
• Require accessibility for maintenance & inspection
• 3rd party inspection for subsurface controls
Concepts

- Low Impact Development
- Green Infrastructure
- Pre-Development Hydrology
- Volume-Based Hydrology
1.6.5 *Sedimentation Sand Filtration*

- Austin’s Main WQ control: 83% of all WQ controls; 2,500+ in service!
- Basic; familiar to design, build, maintain
- Good solids removal & erosion detention
- Drains in 48 hours; **limited benefit to baseflow**
- Can serve up to 50 acres drainage (end of pipe)
- Requires professional maintenance
- Poor aesthetics/single function
- **Poor dissolved pollutant performance**, e.g., nitrogen
1.6.6 Wet Pond

- Longstanding, high-profile control (6% of all WQ controls; 180+ in service)
- Can be amenity, serve large drainage areas
- Provides aquatic habitat
- High cost to build, maintain, keep wet
- Requires specialized maintenance/expertise
- Must serve a relatively large drainage area
- Accommodates flood detention in same basin
# Green Storm Water Quality Infrastructure: Current Options (ECM 1.6.7)

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Multiple rain gardens may be dispersed across a development and incorporated into the landscape, providing aesthetic as well as ecological benefits.

(Source: ECM Figure 1.6.7.H-1)

The 4 S’s
Slow it down.
Spread it out.
Soak it up.
Source control.
Example of the preferred offline system configuration for flow control. (Source: Figure 1.6.7.H-7)
City information brochures

**earth-wise guide to**

**Rain Gardens**

*Keeping Water on the Land*

**what is a rain garden?**

A rain garden is a shallow, vegetated depression designed to absorb and filter runoff from hard (impervious) surfaces like roofs, sidewalks, and driveways. Rain gardens are usually planted with colorful native plants and grasses. They not only provide an attractive addition to the yard, but also help to conserve water and protect our water quality.

**how does a rain garden help?**

As Austin becomes increasingly urbanized, native landscapes are replaced with impervious surfaces that prevent rainwater from soaking into the ground. Stormwater quickly runs off these hard surfaces, picking up pollutants from the land and carrying them to our creeks. This rapidly flowing water also increases the chances of flooding and erosion.

The goal of a rain garden is to keep water on the land. Rain gardens, with their shallow depressions, capture stormwater and provide for natural infiltration into the soil. This provides water for the plants and helps maintain a constant flow of water into our streams.

**Create A Rain Garden in Six Steps**

**1. Find the Right Location**

- Observe the flow of water from rooftops, driveways or other hard surfaces and place the rain garden where this water collects
- Select an area on gently sloping or flat land
- Calculate the slope of your lawn (instructions on next page). The slope should be less than 10%
- If possible, pick a spot in full to partial sun. Shady locations will still work, but the options for flowering plants are

RAIN GARDEN WORKSHOP

Saturday, April 5, 2014 - 9:00am - 12:00pm

Learn how to build a rain garden at your home, school, or community garden! A rain garden is a low area that absorbs and filters rain water runoff that comes from roofs, sidewalks, and driveways. Rain runs off the hard surfaces, collects in the shallow depression, and slowly soaks into the soil.

Rain gardens are planted with colorful native plants and grasses, and, where the water collected is free of contaminated run-off, food-producing plants can be used, as well! Join the City of Austin’s Watershed Protection Department and the Sustainable Food Center for an interactive, outdoor, hands-on introduction to rain gardens at the J.F.’s Peace, Love and Happiness Foundation Teaching Garden at Sustainable Food Center.

Registration: $35 at http://sustainablefood.nonprofitsoapbox.com/calendar/event/241
Learn more about rain gardens: www.austintexas.gov/raingardens , more gardening tips at www.growgreen.org
Date: Saturday, April 5, 2014
Time: 9:00 a.m. – noon
Location: Sustainable Food Center, 2921 E 17th St, Building C, Austin, TX 78702

http://www.austintexas.gov/event/rain-garden-workshop
Proposed ECM Design Info for Porous Pavement

Water Quality Applications

• Require 5 inches gravel thickness
  – Accommodates “half-inch-plus” water quality volume sizing
  – Addresses loss volume via sedimentation

• Must show captured water infiltrates into underlying soil within 48 hours

• City pond inspectors to inspect every 3 years (per standard cycle like other controls)
Proposed ECM Design Info for Porous Pavement

On-Site Testing

• Essential to test on-site conditions:
  1. Prior to design proposal to determine infiltration rates
  2. During construction to confirm design infiltration rates have been maintained (prior to placement of gravel & pavement)

• Must have minimum 12 inches soil above bedrock and 3 feet above water table
  – If not accounted for, groundwater can fill the water quality volume, creating more bypasses of stormwater
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(Resolution #20110113-038)
"Explore better ways to regulate the modification of floodplains, including options for off-site mitigation for developments in areas that are planned for higher density developments."
Mitigation Options: Ordinance Proposal

• New *floodplain modification* mitigation options

• New *redevelopment options* in Water Supply watersheds (e.g., Lake Austin, Bull Creek)

• Evaluate options for *centers and corridors* in the Imagine Austin Code revision process
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(Resolution #20110113-038)
Simplify Regulations: Ordinance Proposal

• Provisions were included to **minimize impacts** on the ability to develop, especially in Suburban watersheds
  – Eliminate Water Quality Transition Zone
  – Gross site area
  – Buffer averaging

• **Eliminate the Boundary Street Deduction**

• Numerous **clarifications & corrections** of existing code
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(Resolution #20110113-038)
"Work in coordination with Travis County and neighboring communities to develop the above changes."
Chart Course for Improvements

Identify gaps in performance

- Maintain/ Improve Baseflow
- Maintain/ Restore Springflow
- Integrate Water Conservation

Develop methodology to implement

- Rethink Impervious Cover
- Facilitate on-site retention and re-use (rainwater harvesting)
- Require/ incent infiltration BMPs
COA Contact Information

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http://www.austintexas.gov/page/watershed-protection-ordinance-0
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