Watershed & Landscape Ordinance Updates

Landscape Professional Training
July 23, 2014




Austin Water

City of Austin WATERSHED PROTECTION

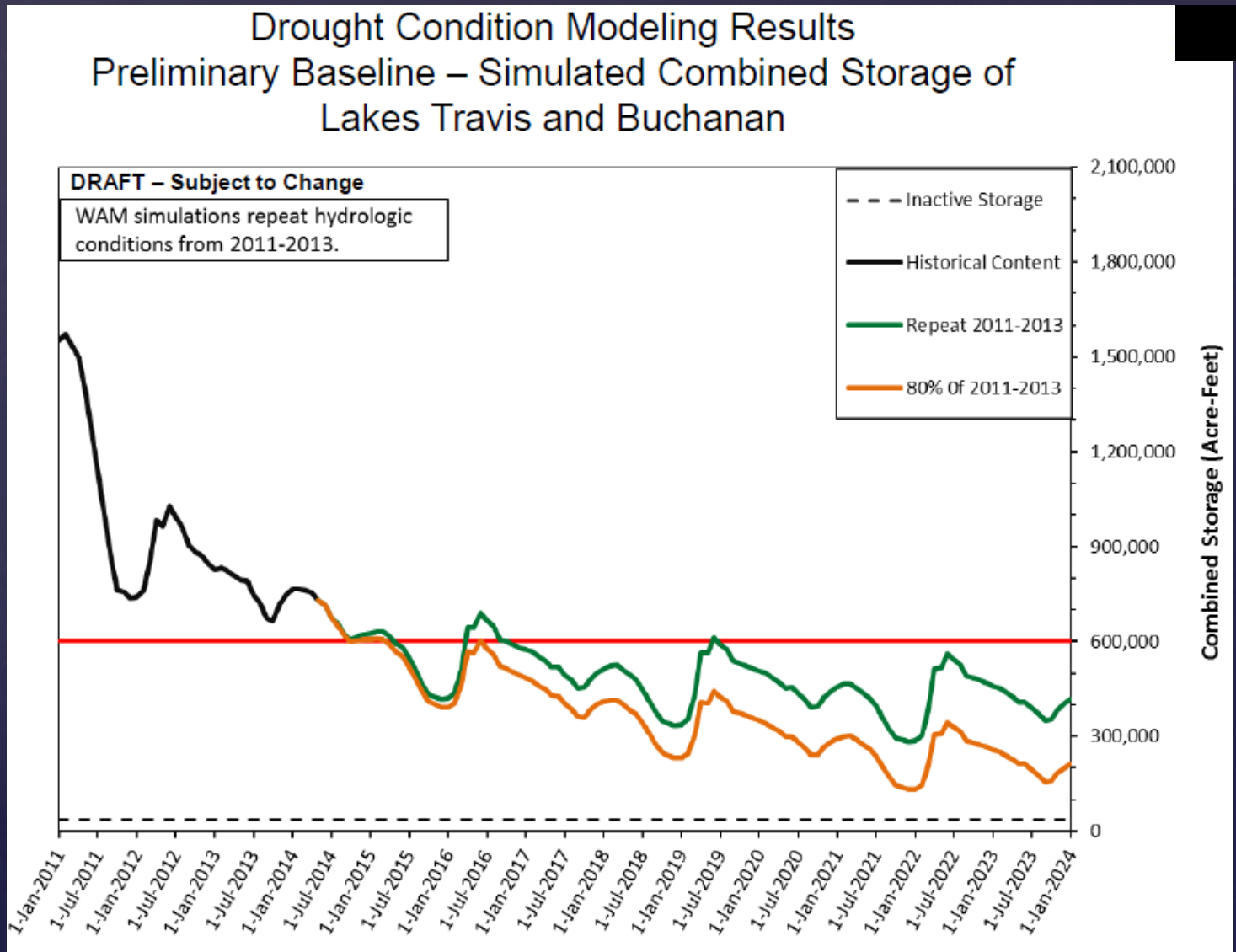
How We Manage Water Matters

LCRA video of Lake conditions, March 10, 2014
http://www.youtube.com/watch?v=hmbIt7kzU1U

How We Manage Water Matters

Source: LCRA. http://www.lcra.org/water/water-supply/drought-update/pages/default.aspx; July 22, 2014

Austin Water Planning Task Force: Grappling with Our Water Predicament



Source: Austin Water staff presentation to Austin Water Resource Planning Task Force, May 5, 2014.

Climate Change Projections for Austin

Toward a Climate-Resilient Austin: May 1, 2014) Report to Council

Category	Current	Projected*
Avg. annual temps		+ 9 to 10°
Summer avg. high temp.	94°	98 - 103°
No. summer days over 100°F	13	35 - 80
No. summer days over 110°F	0 (rare)	1 - 20
Annual avg. precipitation	32"	32-33"
No. days/year > 2" rainfall	2	3
Max. 5 day rainfall	6"	8"
Max. consecutive dry days (no precip.)	52	70 - 75

* Projected by end of this century (2071-2100).

Source: http://www.austintexas.gov/sites/default/files/files/Sustainability/Climate/Toward_a_Climate_Resilient_Austin.pdf

Challenges & Opportunities: Connecting the Dots…

1. Central Texas prone to periodic droughts
2. Droughts & heat predicted to worsen
3. Regional surface & groundwater supply finite (falling?)
4. Population growth among fastest in nation (expected to double in 30 years)
5. Natural land cover retains over 90% of avg. annual rainfall; sustains plants, creek flows, aquifers
6. Uncontrolled urbanization degrades these benefits
7. Can incorporate natural systems & rainwater storage in designs to offset water use, preserve quality of life
8. Practical methods/models already exist to accomplish
9. Let's get this done!

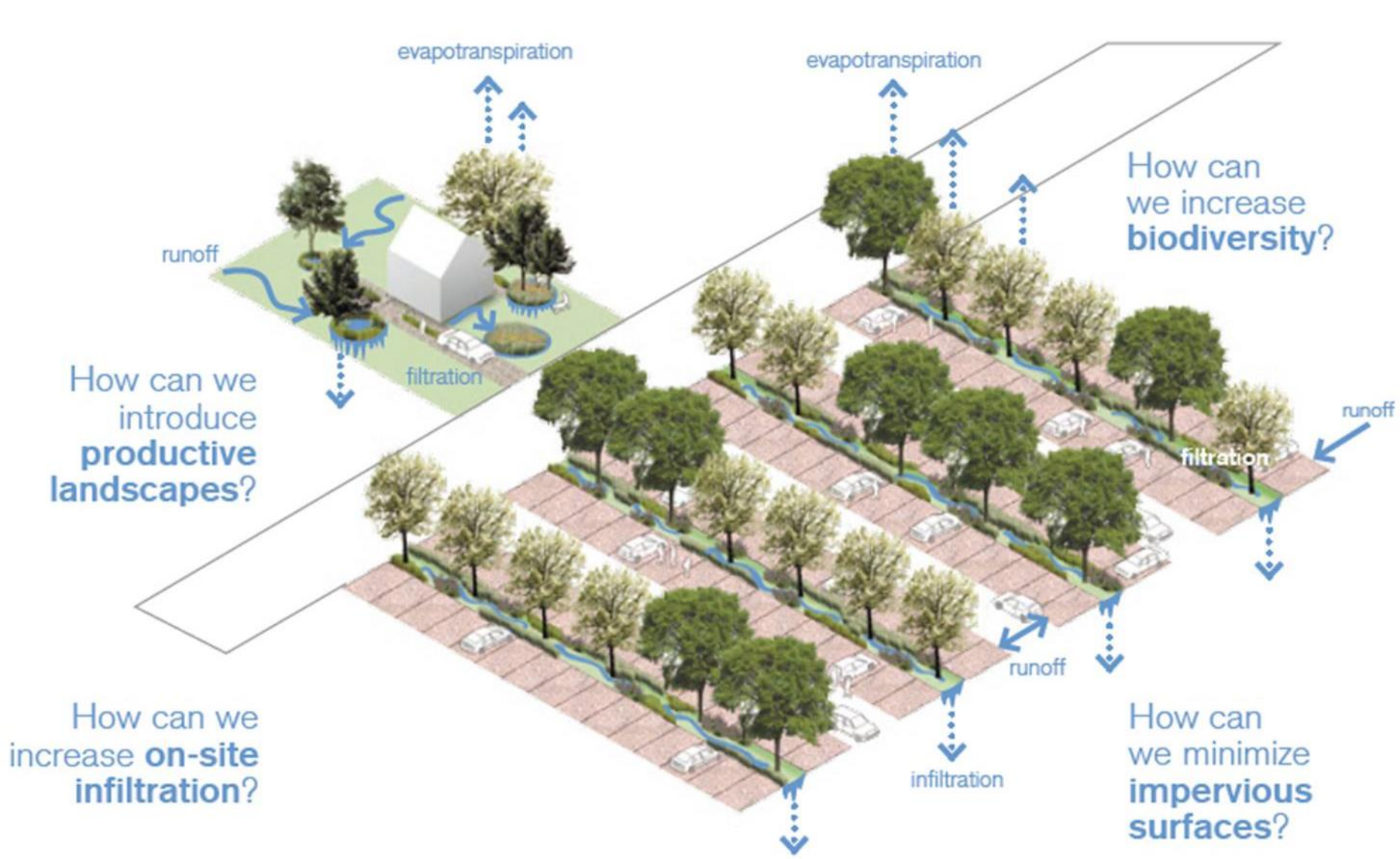
Water Management Vision

- 2010 Landscape Ordinance
- Watershed Protection Ordinance (WPO) Phase 2: Beneficial Use of Stormwater
  - Retain/infiltrate water on-site for baseflow, quality, vegetation
  - Capture rainfall conservation/reduce potable water use
  - Follow national examples (Maryland et al.)
- Austin Water Resource Planning Task Force
  - "Tapping into the Cityscape as a Water Supply Source"
- Imagine Austin Comprehensive Plan
  1. Compact & Connected: accommodate growth
  2. Green Infrastructure: integrate nature into the city
  3. Sustainably Manage Our Water Resources
  4. Code NEXT

"…take a solution and divide it neatly into two problems."
Wendell Berry

Conventional Approach

Low Impact Development Approach



Source - Low Impact Development: a design manual for urban areas (University of Arkansas)

Low Impact Development Approach

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Innovative Water Management for Commercial Landscaping

- Adopted by Council on December 16, 2010
- Amended Chapter 25-2, Subchapter C, Article 9 of Land Development Code (*Landscaping*)
- Goals of Ordinance:

Use rainwater wisely

Conserve potable water

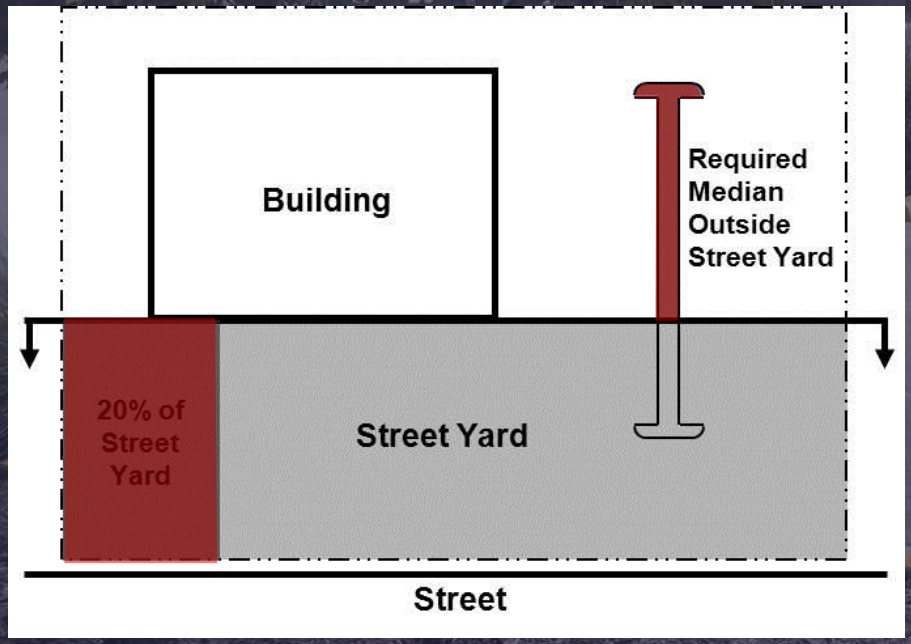
Help improve water quality

Ordinance Summary

- Commercial stormwater runoff must be directed to **50 percent** of required landscaped areas
- Can use non-required landscaping as long as area is equivalent to 50 percent of required area
- Landscaped areas can be—but are not required to be—designed to achieve water quality credit
- Undisturbed natural areas and undisturbed existing trees can also be counted toward the requirement

Required Landscape Area

For the purposes of this ordinance, **Required Landscaped Area** equals 20 percent of the street yard plus any islands, medians, & peninsulas required outside of the street yard



50 percent of the Required Landscaped Area

Street Yard

Required Landscaped Area Calculation

Design: Conveyance

Design: Other Requirements

- Minimum drainage area shall be a ratio of 1 square foot of drainage to 2 square feet of landscaped area (1:2)
- Site plan must show as part of the landscaping plan the drainage area(s) used to irrigate landscaping with stormwater
- Stormwater from "hot spot" land uses (e.g., gas stations) and parking lots over the Recharge Zone may not be used unless landscape doubles as a water quality control

Design: Other Considerations

- May require an impermeable barrier if adjacent to buildings, roadways, and parking lots to prevent damage from infiltration (at discretion of design engineer)
- Must still be protected by curbs or equivalent barriers if adjacent to vehicular use areas
- Should be designed to avoid the extended ponding of stagnant water
- Should account for pedestrian safety (e.g., gentle side slopes, protective barriers)

Undisturbed Vegetation Credit

- Undisturbed natural areas or undisturbed existing trees can count toward the 50 percent requirement
- Stormwater does not have to be directed to these areas (although still encouraged)
- No potable water irrigation is allowed to receive credit

Supplemental Irrigation

- Irrigation systems required for all newly planted trees
- Irrigation systems are required for all other newly planted landscaping, unless certain conditions are met:
  - receiving stormwater runoff
  - drought tolerant plant palette
  - low foot-traffic areas
- Temporary irrigation required for two growing seasons if no permanent irrigation is provided

Example: LCRA Redbud Center

Example: St. Edwards University

Example: Payload Pass

Example: Reese & Grover

Case Study: CVS Pharmacy

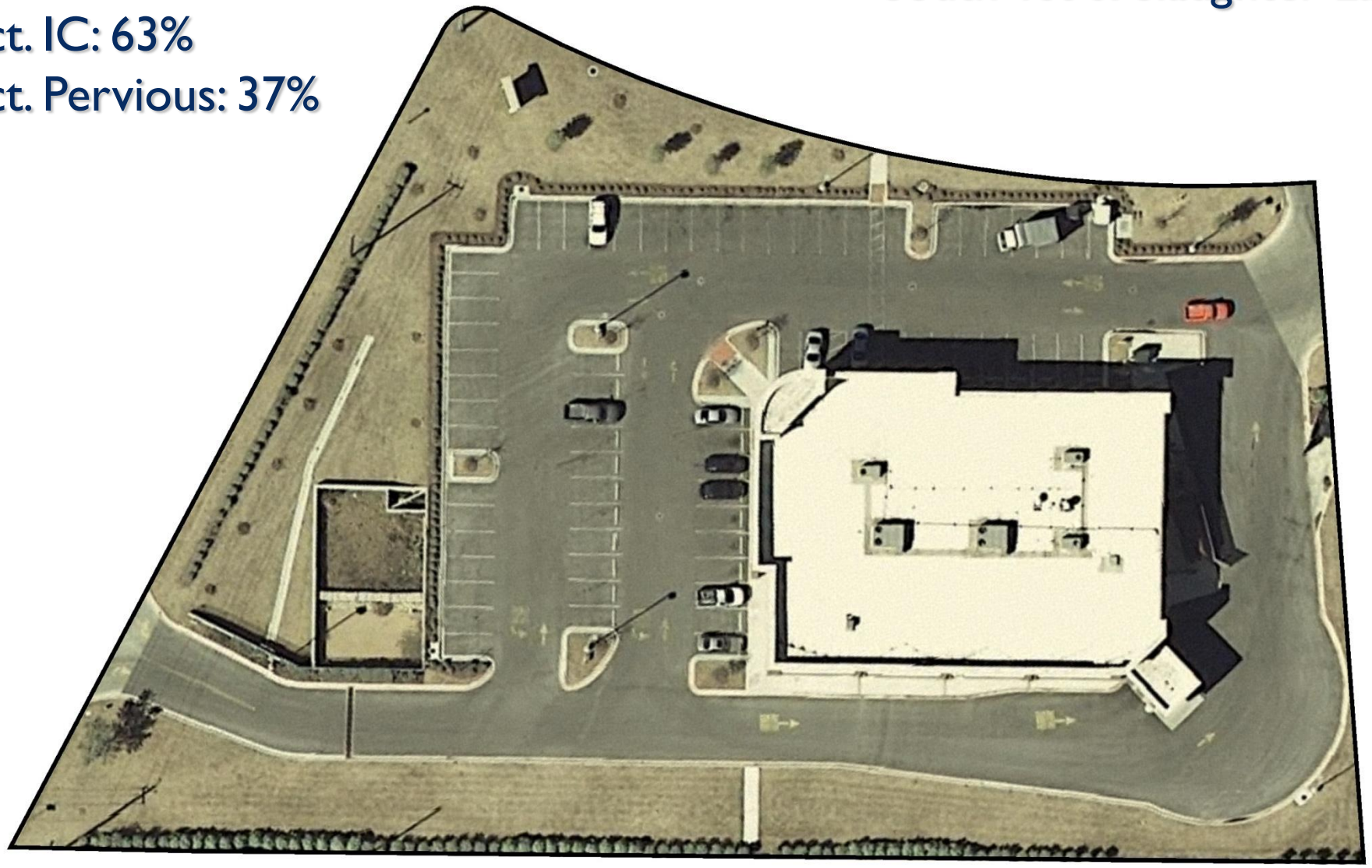

CVS Pharmacy
South 1st & Slaughter Lane


CVS Pharmacy
South 1st & Slaughter Lane

Total Site: 2.4 acres
Pervious: 0.9 acres
Pct. IC: 63%
Pct. Pervious: 37%

CVS Pharmacy

South 1st & Slaughter Lane




CVS/pharmacy
520
WE ACCEPT LONE STAR
DRIVE THRU PHARMACY
milk $3.49


CVS
pharmacy
EXTRA DIABETES
SAVINGS
SIGN UP NOW


JOHN DEERE


FULL SERVICE
FULL SERVICE

CVS Pharmacy

South 1st & Slaughter Lane

Total Site: 2.4 acres
Pervious: 0.9 acres
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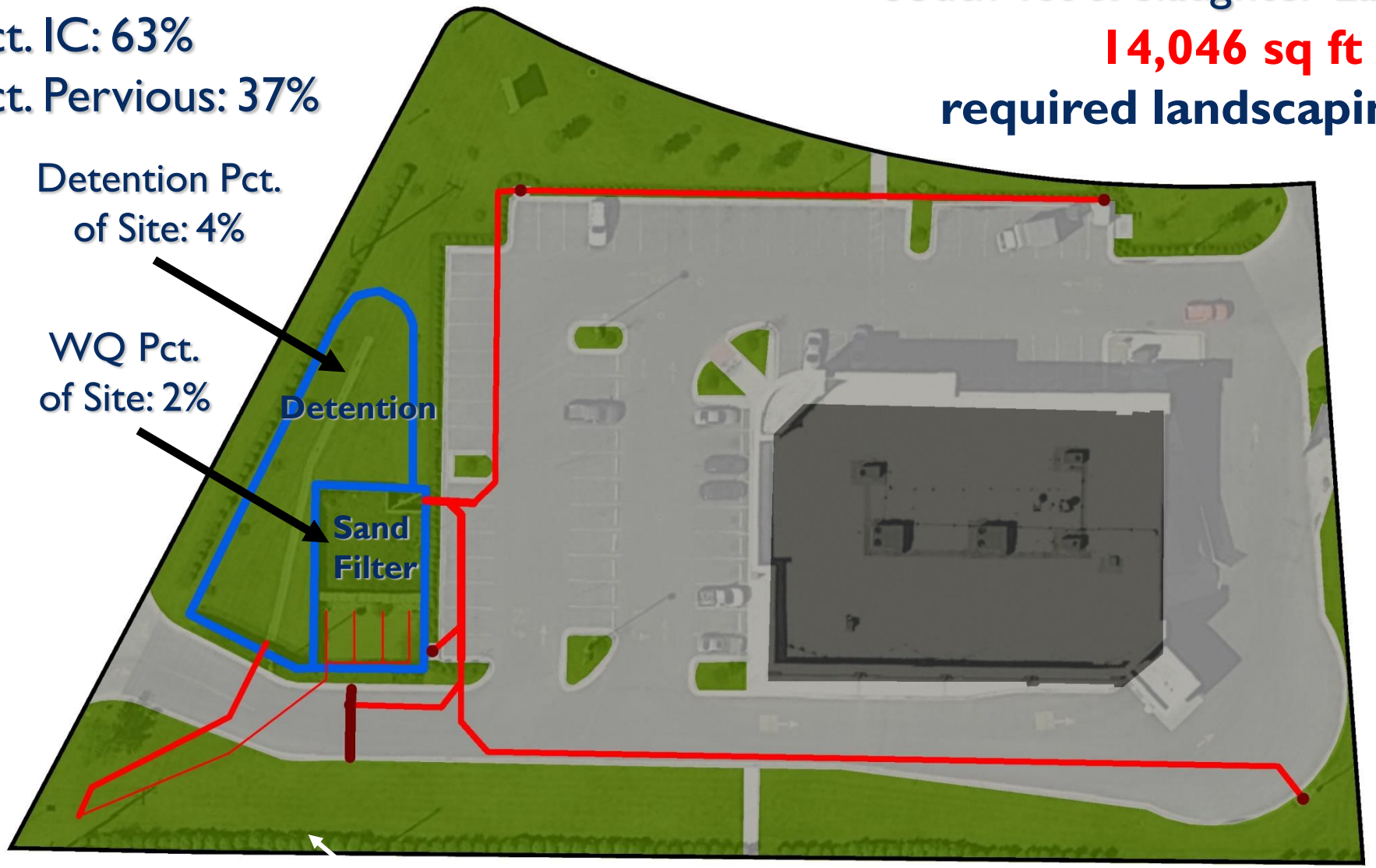
14,046 sq ft of required landscaping



Landscaping Pct. of Site: 14%

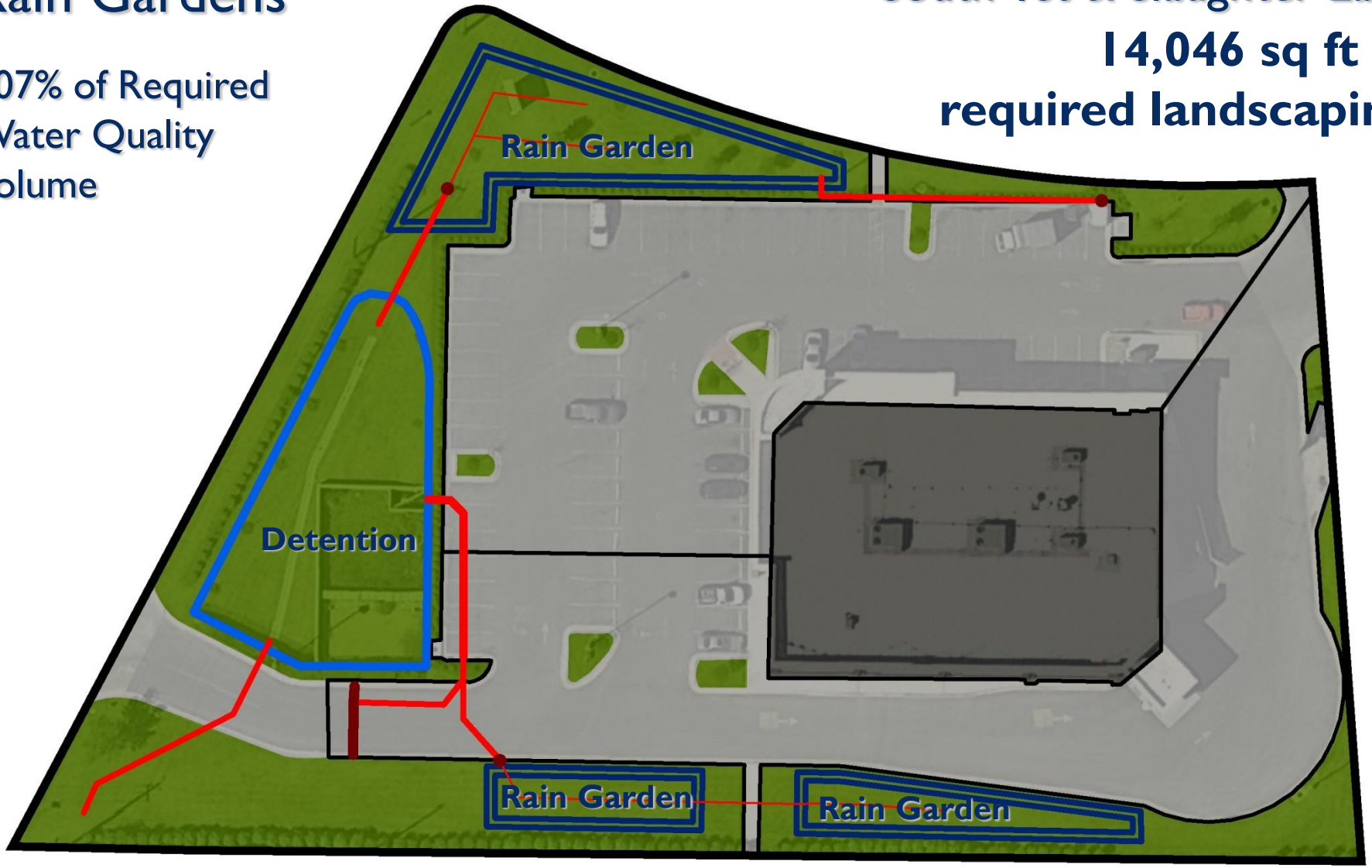
Potential for Rain Gardens

107% of Required Water Quality Volume

CVS Pharmacy

South 1st & Slaughter Lane

14,046 sq ft of required landscaping



CVS Site: Conventional Sand-Filter vs. Rain Garden Cost Analysis

Cost Component	$/Units	Rain Garden	Existing/ Conventional	
Water Quality Control				
Excavation	$15/yd3	$ 5,863	5,823	
Embankment	$5/yd3	$ 358	$ -	
Concrete	$500/yd3	$ -	$ 34,861	
Rain Garden Soil	$36/yd3	$ 8,062	$ -	
Sand	$8/yd3	$ -	$ 421	
6" perforated pipe	$23/ft	$ 4,674	$ 2,185	
6" solid pipe	$20/ft	$ 1,701	$ 1,900	
Subtotal Water Quality Control		**$ 20,658**	**$ 45,190**	
Storm Drainage				
18" RCP	$90.30/ft	**$ 30,702**	**$ 72,782**	
Landscaping (Water Quality areas only)				
Required Plants $/Plant	$16/each	$ 9,744	$ 2,100	*
Sod cost	$3.60/yd2	$ 1,719	$ 859	*
Subtotal Landscaping		**$ 11,463**	**$ 2,959**	
Totals		**$ 62,823**	**$ 120,931**	

* Pro-rated costs for landscaping in areas in common with rain garden

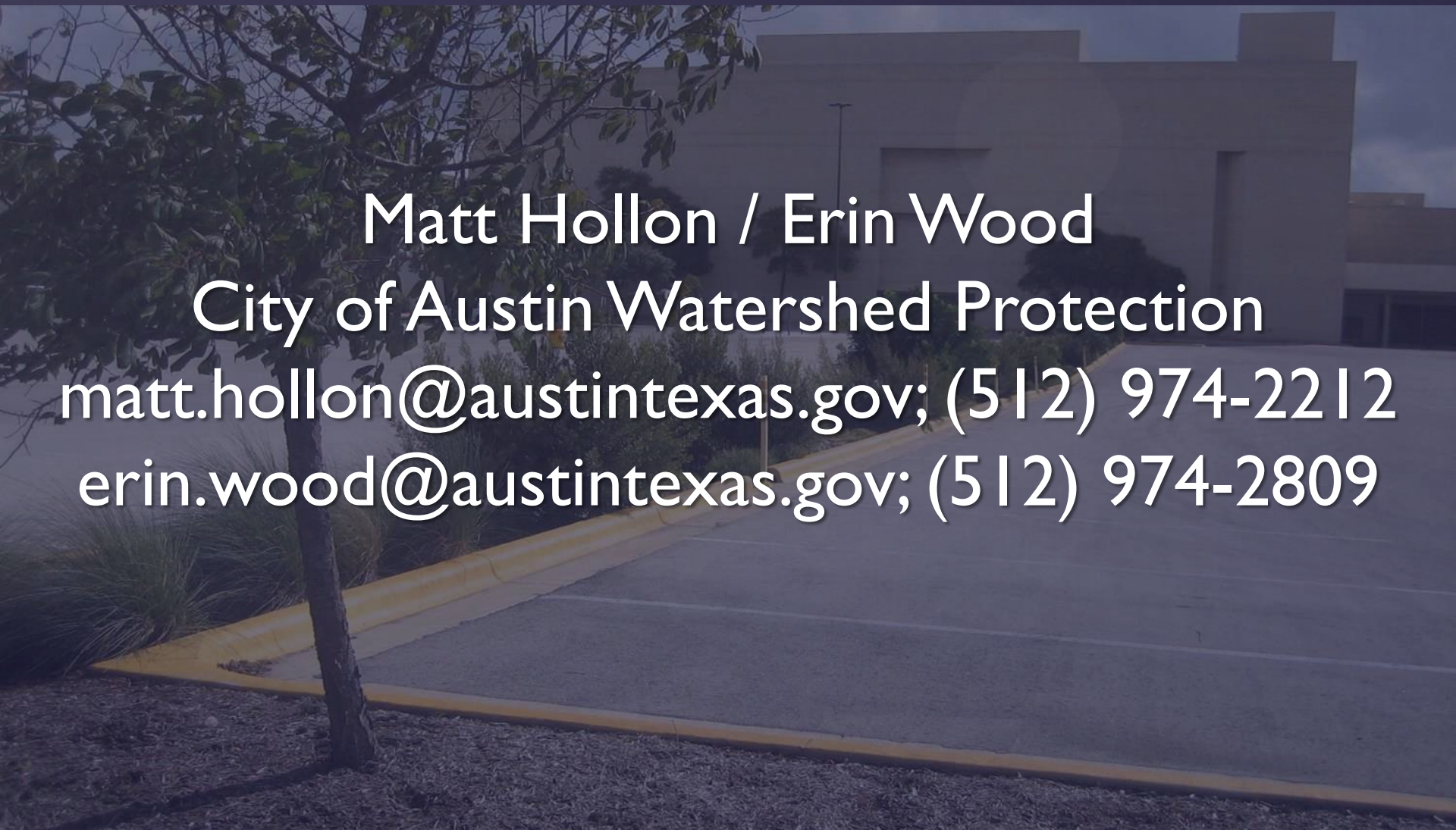
2010 Landscape Ordinance: Critique

- Good forward progress/intention
  - More care and thought required for site design
  - Wiser use of runoff
  - Protection of natural areas
- Retains Suburban development focus of original 1979 & 1982 Landscape Ordinances
- Degree of environmental benefits varies widely:
  - Flag lots can do almost nothing (de minimus street yard)
  - Possible to count (already protected) stream buffers etc. as natural areas
  - Beneficial stormwater use encouraged, not required—can be ignored
- Does not push envelope on green site design and water management
- Contains provision to reevaluate and, if necessary, improve

Vision & Next Steps

- Watershed Protection Ordinance Phase 2: Beneficial Use of Stormwater
- Austin Water Resource Planning Task Force
- 2010 Landscape Ordinance: Next level?
- Imagine Austin Comprehensive Plan: Code NEXT
- Search for win-win solutions
  - Research national models, experience (e.g., Washington DC "Green Area Ratio" and Georgia stormwater regulations)
  - Require stormwater retention and/or re-use on-site
  - Enact Task Force "cityscape as water supply" vision
  - Integrate nature into the city (landscaping) via Code NEXT
  - Encourage community input, suggestions

Contact Information



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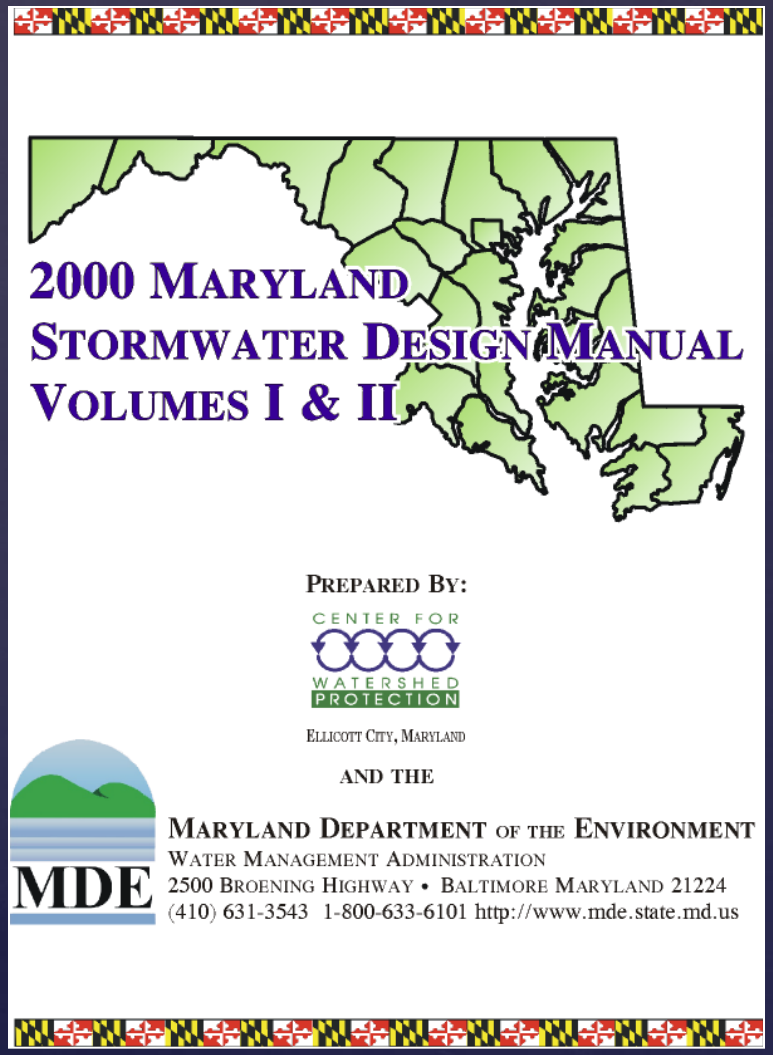
Questions?

Disconnected Downspout
Blarney Castle, Ireland

Maryland Stormwater Model



1. Maryland (2000)
2. Georgia (2001)
3. Vermont (2002)
4. Minnesota (2008)
5. New York (2010)
6. West Virginia (2012)

All six of these stormwater manuals written by the Center for Watershed Protection. Other good models exist too.

Maryland Stormwater Requirements

Main elements that differ from Austin approach:

- Require a recharge volume be infiltrated on-site
  - Subset of water quality volume
  - Infiltrated on-site with structural or non-structural controls
  - Hydrologic Soil Group (HSG) dependent; multiply WQ volume by the following: HSG A = 0.38; HSG B = 0.26; HSG C = 0.13; HSG D = 0.07
- Use non-structural "Environmental Site Design" (ESD) practices to "maximum extent practicable" (MEP)
- Use structural controls "only where absolutely necessary"
- Spreadsheet to help calculate ESD practices
- "Concept Phase" precedes site development plan submittal

EPA Guidelines for Federal Projects

Goal: Maintain/restore predevelopment site hydrology during development/redevelopment process to protect and preserve both water resources on-site and downstream.

1.88 inch rainfall for Austin; 90th percentile = 1.35 in.

Two options:

1. Prevent offsite discharge from all rainfall events ≤ 95th percentile rainfall event to the maximum extent technologically feasible; or
2. Conduct site-specific hydrologic analysis to determine pre-development runoff conditions and quantify post-development runoff volume and peakflow discharges equal to predeveloped condition.

2009 EPA "Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act"
http://water.epa.gov/polwaste/nps/upload/eisa-438.pdf

EPA Region 4 Guidance for MS4 Participants: GSI & Quantifiable Objectives

"Although the performance standards and practices discussed in this [2009 EPA technical] guidance were developed to apply to federal development and redevelopment projects, they can serve as a useful guide for municipal systems as well. **We encourage States to replicate similar green infrastructure and quantifiable objectives in their MS4 permits**, or at least develop a plan on working towards comparable requirements. We also recognize that some MS4s may not be equipped to achieve a 95th percentile storm events, but Region 4 does expect States to use their judgment to identify in MS4 permits an alternatively appropriate, specific, and measurable threshold that **maximizes the practice of infiltration, evapotranspiration, and/or rainwater harvesting and use**." [*emphasis added*]

James Giattina, US EPA Region 4. Memo to Florida Dept. of Environmental Protection: "Expectations for Municipal Separate Storm Sewer System [MS4] permits," April 15, 2010.