



May 20, 2016

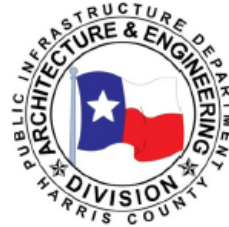
# ***LOW IMPACT DEVELOPMENT INCENTIVES AND CREDIT PROGRAMS***

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ENV SP, BCEE  
Manager, Sustainability Practice



# **EXISTING INCENTIVES IN HOUSTON REGION**

# Harris County Low Impact Development & Green Infrastructure Design Criteria for Storm Water Management



Submitted by: Arthur L. Storey, Jr., P.E.  
Executive Director, Public Infrastructure Department

John Blount, P.E.  
Director, Architecture & Engineering Division

Michael D. Talbott, P.E.  
Director, Harris County Flood Control District

Adopted by Harris County Commissioners Court

Ed Emmett  
County Judge

El Franco Lee  
Commissioner, Precinct 1

Steve Radack  
Commissioner, Precinct 3

Jack Morman  
Commissioner, Precinct 2

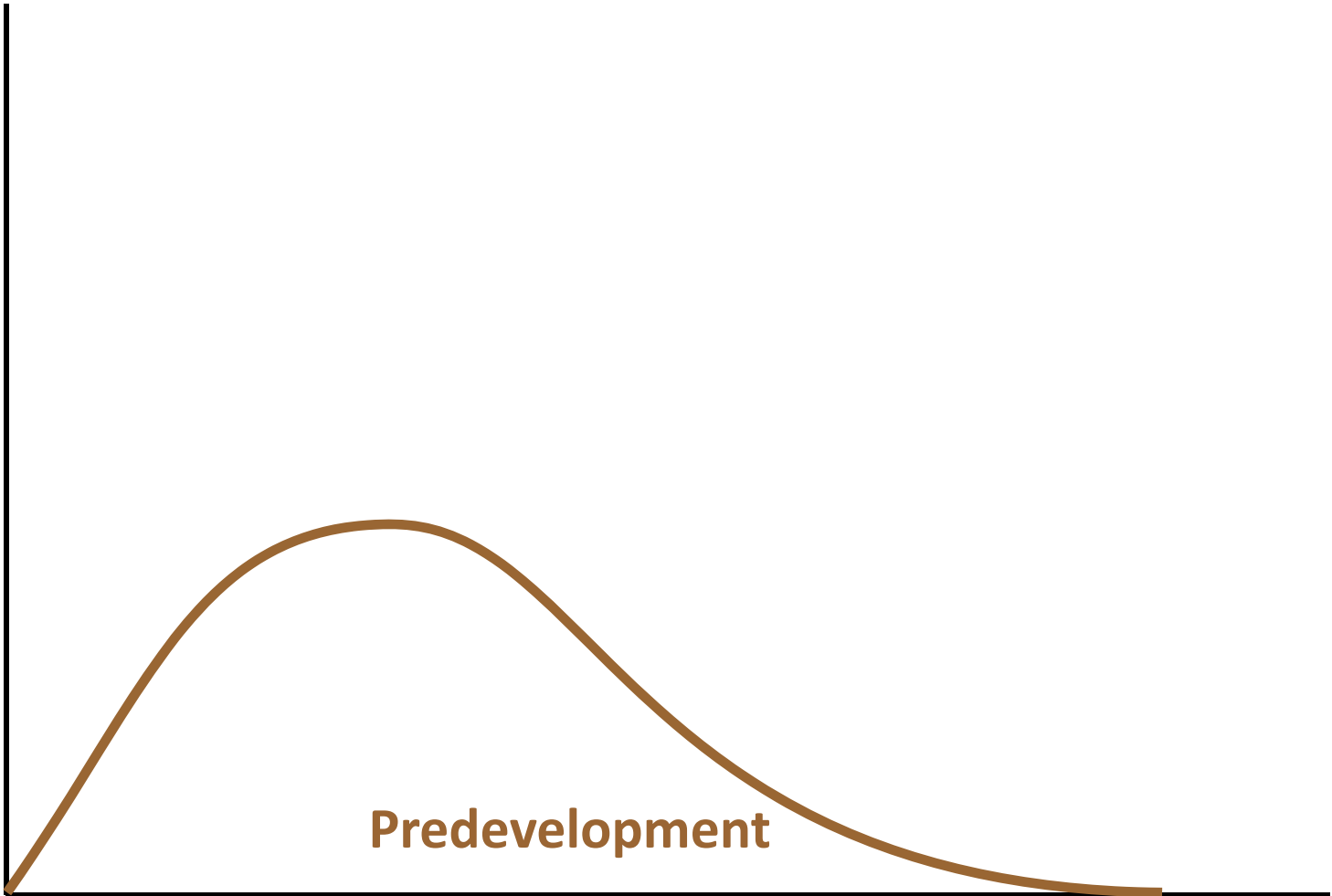
Jerry Eversole  
Commissioner, Precinct 4

Adopted April 2011

# HARRIS COUNTY DESIGN PROVISIONS

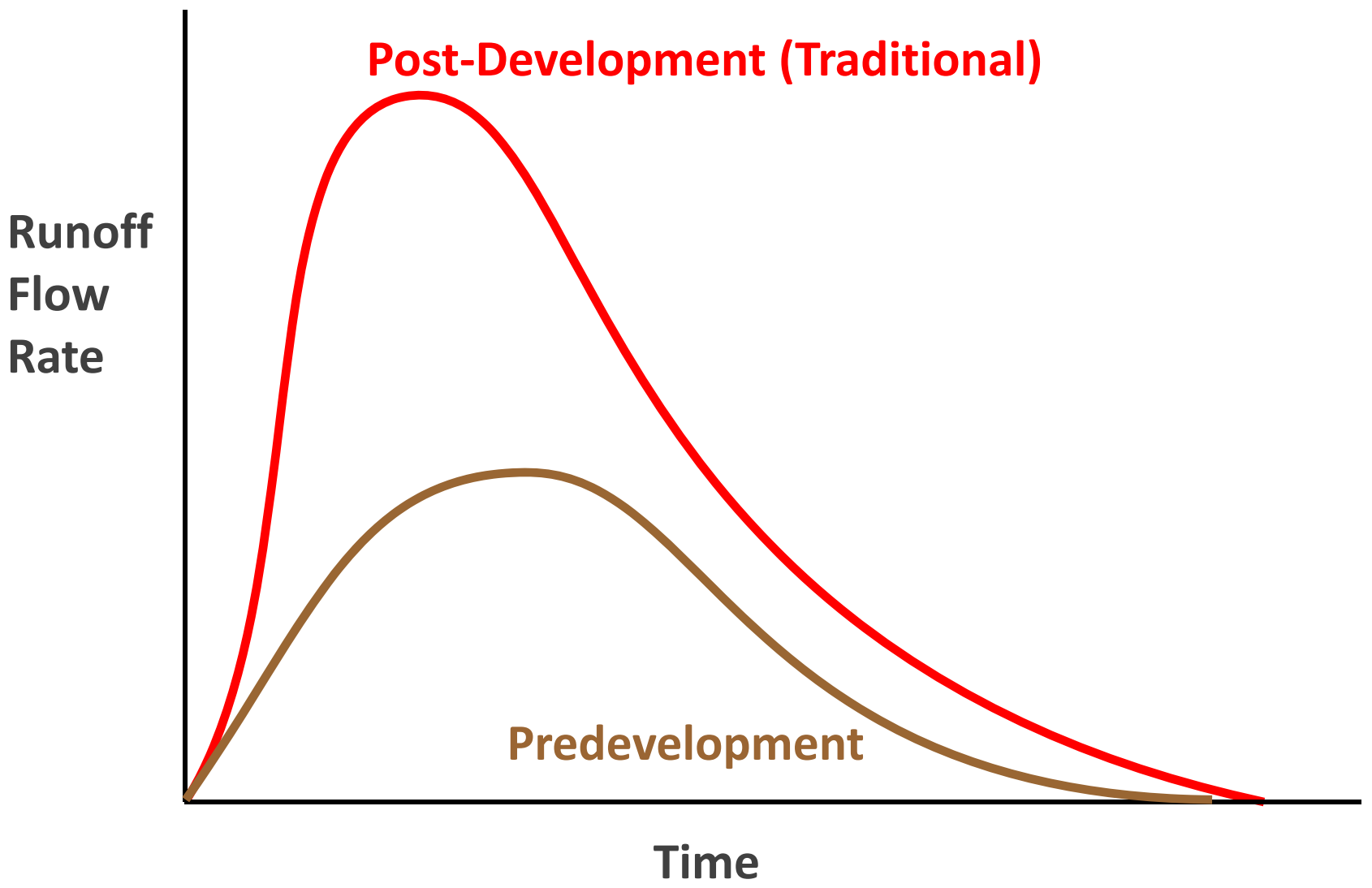
<b>Requirement</b>	<b>Traditional</b>	<b>Low Impact Development</b>
<b>HCFC D Gravity Drained Detention</b>	<b>0.55 ac-ft/ac</b>	<b>0.35 ac-ft/ac minimum</b>
<b>Detention for Gravity Flow to HC Roadside Ditch</b>	<b>0.75 to 1.0 ac-ft/ac</b>	<b>0.55 ac-ft/ac minimum</b>
<b>Detention for Gravity Flow to HC Storm Sewer</b>	<b>0.65 ac-ft/ac</b>	<b>50% of Required Rate</b>
<b>Peak Flows</b>	<b>Post-Project &lt; Pre-Project</b>	<b>Post-Project &lt; Pre-Project</b>

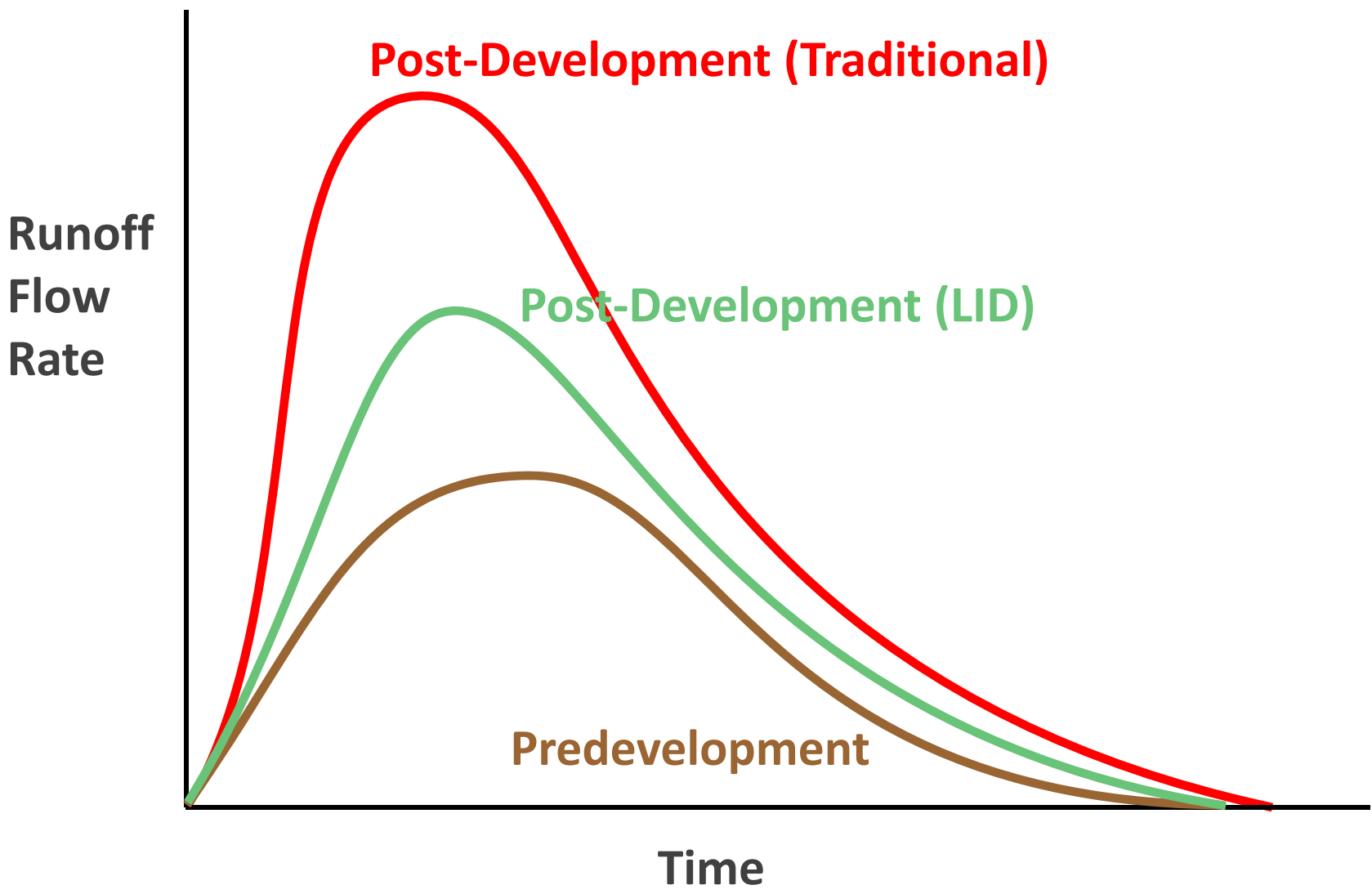
**Runoff  
Flow  
Rate**

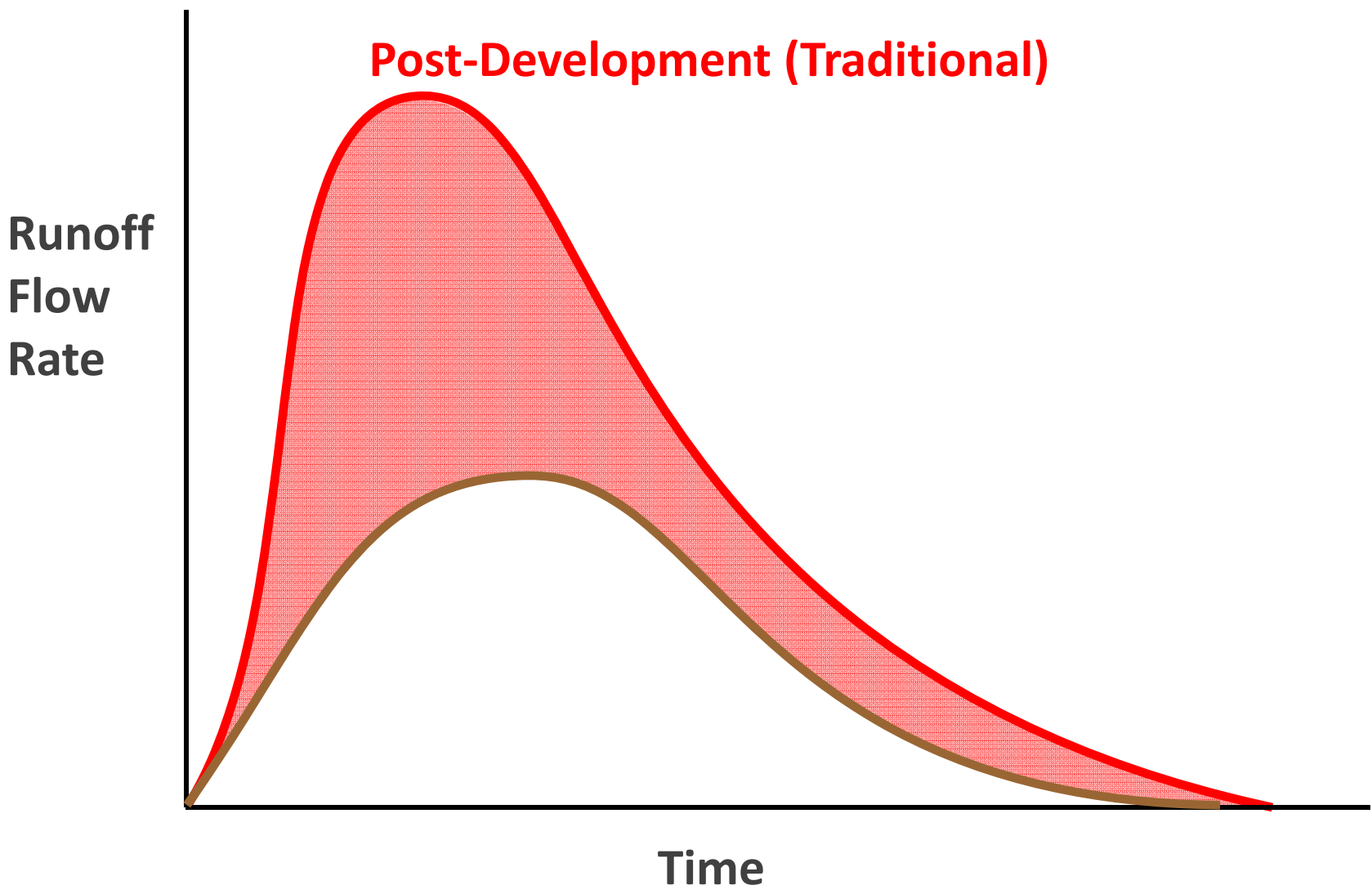


**Predevelopment**

**Time**

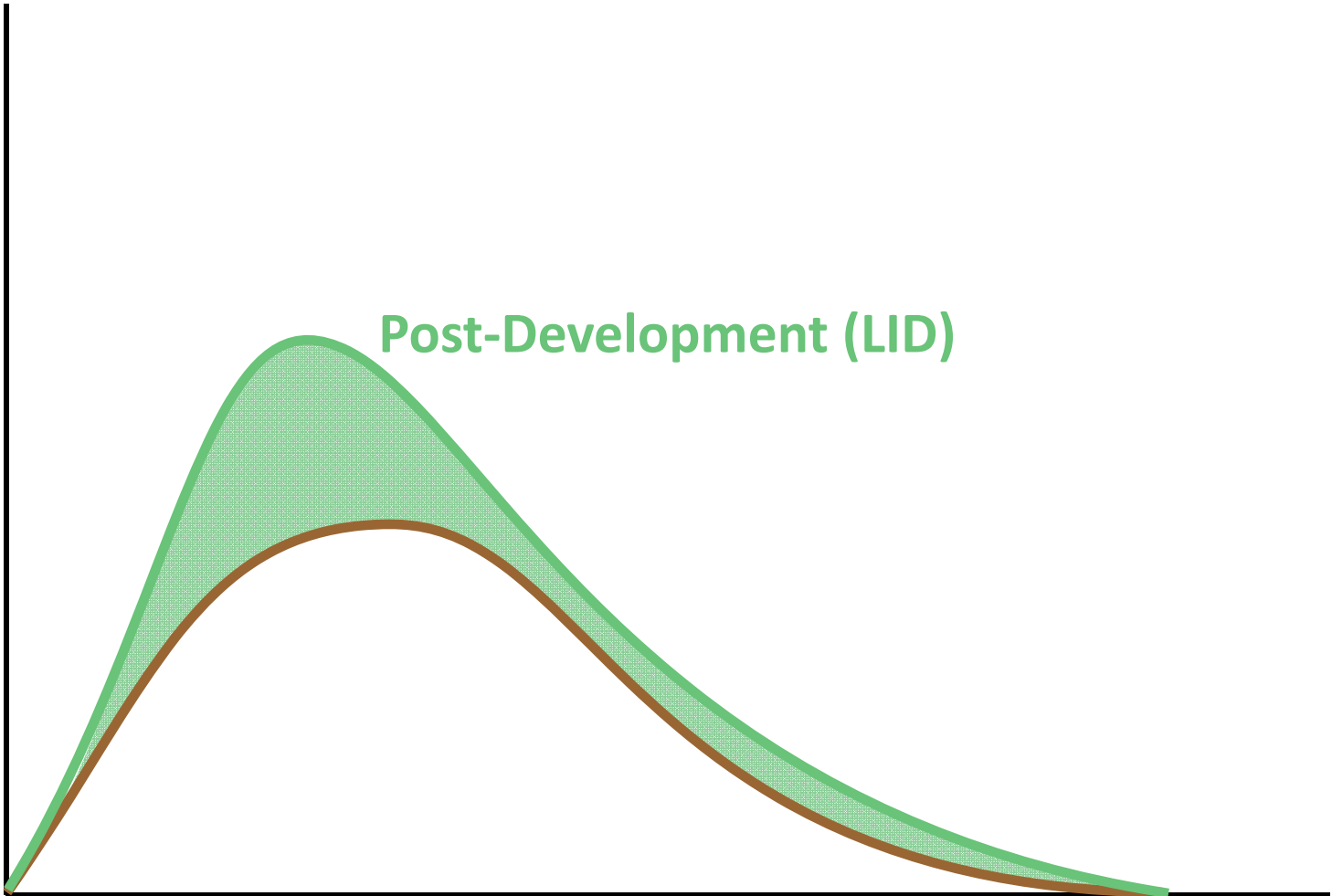








Runoff  
Flow  
Rate



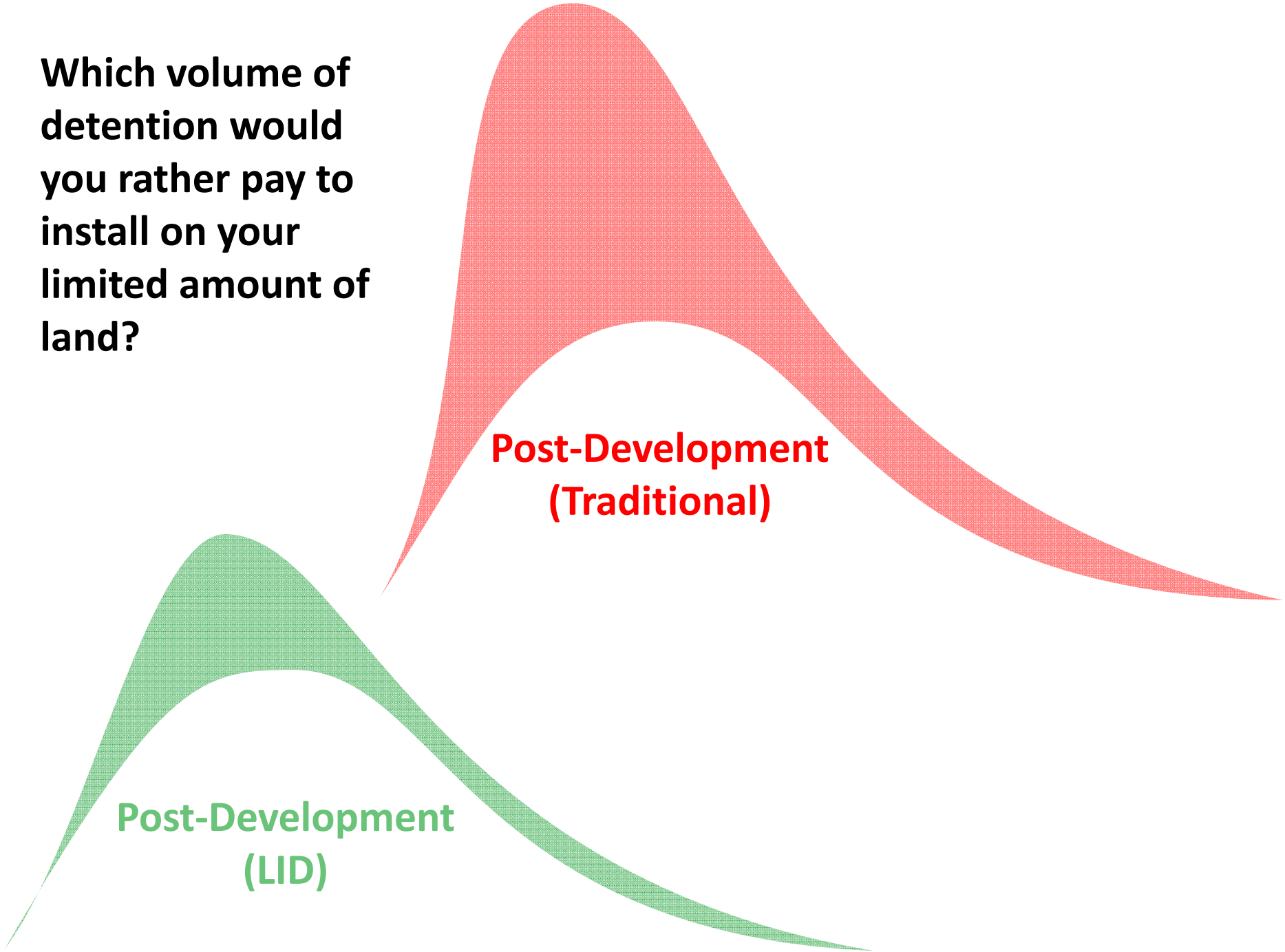
Post-Development (LID)

Time

**Which volume of detention would you rather pay to install on your limited amount of land?**

**Post-Development  
(Traditional)**

**Post-Development  
(LID)**



**CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS  
AND ENGINEERING**

**INFRASTRUCTURE  
DESIGN MANUAL**

**DALE A. RUDICK, P.E.,  
DIRECTOR**

**J. TIMOTHY LINCOLN, P.E.,  
CITY ENGINEER**



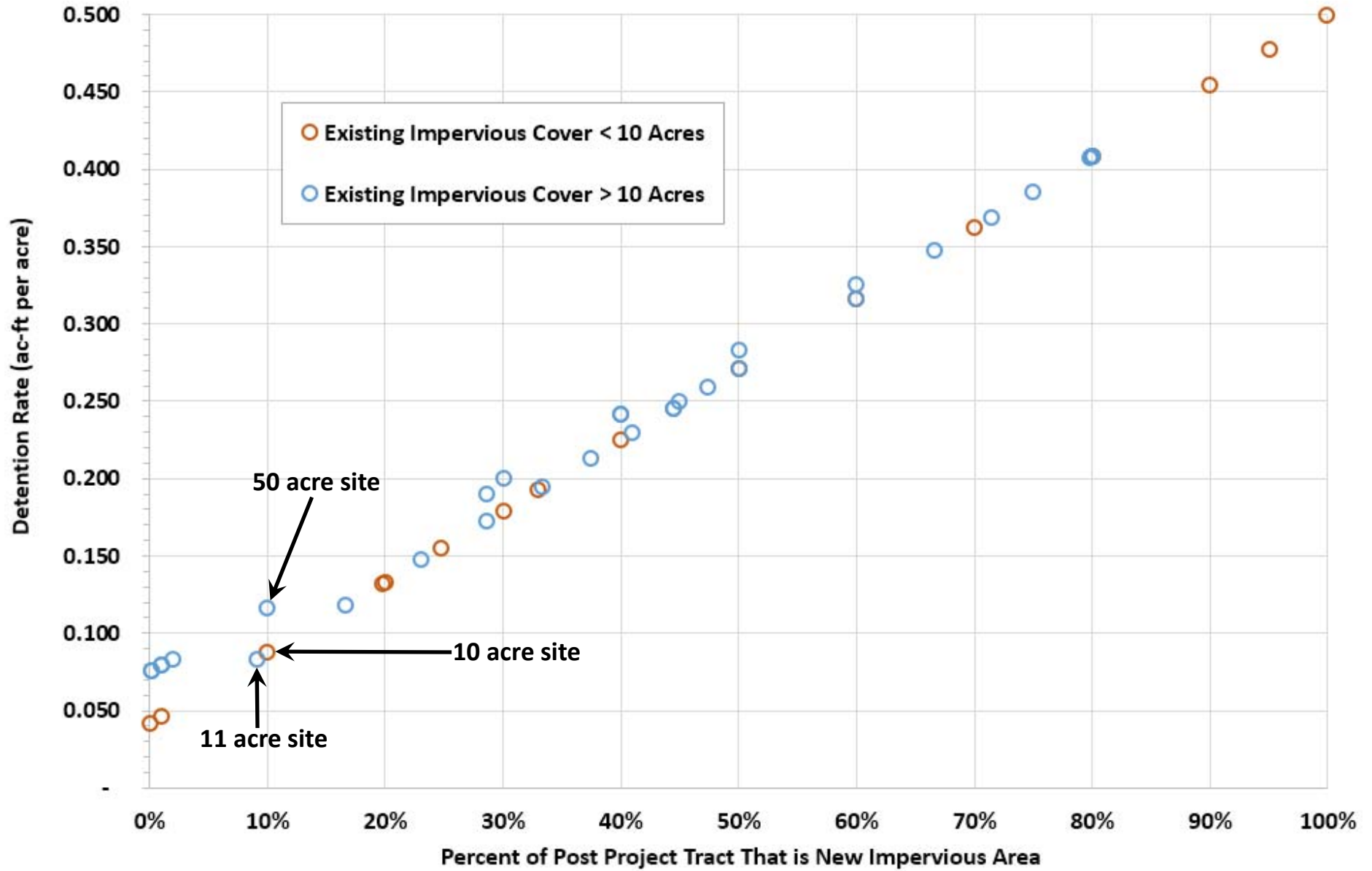
**JULY 2015**



# CITY OF HOUSTON DESIGN PROVISIONS

Requirement	Chapter 9 Traditional	Low Impact Development
Detention on < 1 ac Tracts	0.2 ac-ft per ac of new imp + 0.04 ac-ft per ac existing imp	<p><i>Requires same volume of detention. See Chapter 13 for ideas about how reduce new impervious area.</i></p>
Detention on 1 to 10 ac Tracts		
Detention on 10 to 50 ac Tracts	See curve on next slide.	
Detention on > 50 ac Tracts	As per HCFCD criteria	

## Detention Requirements for City of Houston Sites Between 10 - 50 Acres





## Pervious Concrete Contractor Certification Program

### *Important Links:*

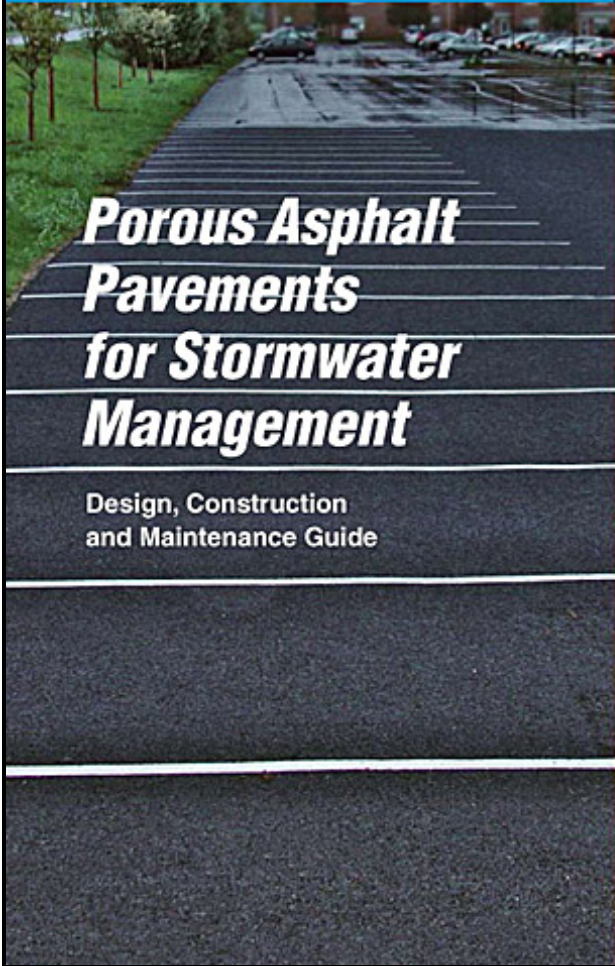
- ▶ [Database](#) of Certified Pervious Concrete Craftsmen, Installers & Technicians
- ▶ [List](#) of Approved Local Sponsoring Groups
- ▶ [Applications](#) for Local Sponsoring Groups



### *Upcoming Pervious Courses:*

June 13, Nashville, TN - Tennessee Concrete Association  
[Pervious Concrete Technician Certification](#)  
Email: [dsparkman@tnconcrete.org](mailto:dsparkman@tnconcrete.org), 615-360-7393

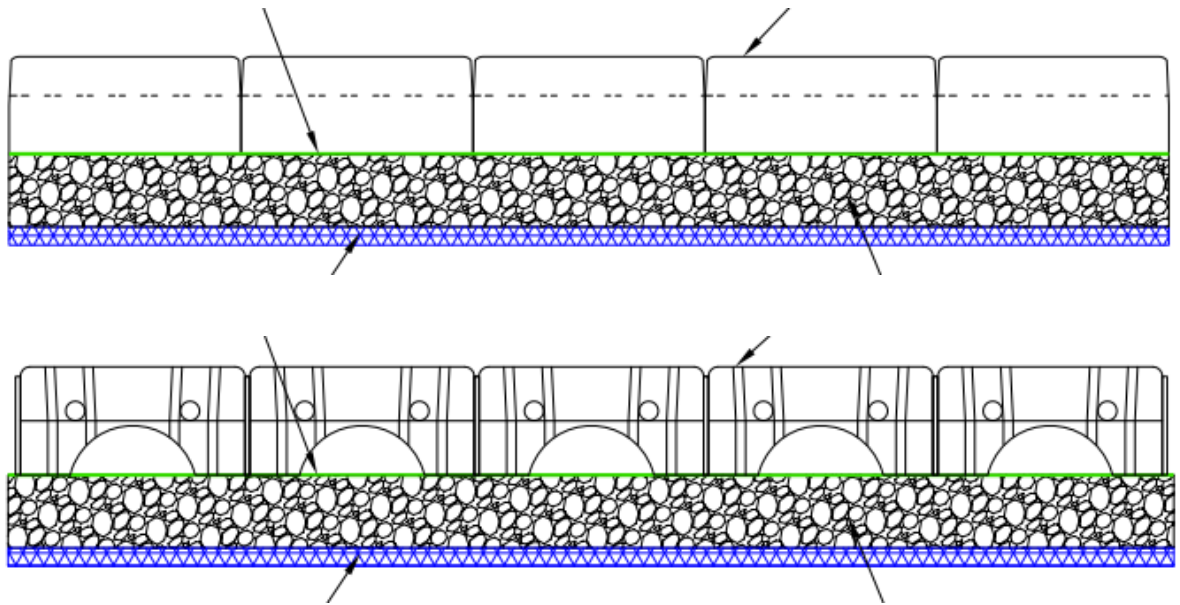
Information Series 131



# ***Porous Asphalt Pavements for Stormwater Management***

Design, Construction and Maintenance Guide







# INFRASTRUCTURE REIMBURSEMENT

- **Authority:**
  - Texas Water Code Section 49.001(1) (TWC §49.001(1))
  - Title 30 Section 293 of Texas Administrative Code (30 TAC 293)
- Developer finances public infrastructure utilities
- District accepts ownership
- District obtains TCEQ approval for infrastructure bond issues
- District issues bonds
- District reimburses developer
- LID facilities serve a drainage infrastructure purpose and are reimbursable



# **OTHER INCENTIVES OFFERED IN OTHER REGIONS**




★ ★ ★ DEPARTMENT  
OF ENERGY &  
ENVIRONMENT

*RiverSmart*  
*clean water starts here*



## RiverSmart Rewards and Clean Rivers IAC Incentive Programs

Apply for RiverSmart Rewards and receive discounts on your DC Water bill. District residents, businesses, and property owners can earn a discount of up to 55% off the DOEE Stormwater Fee when they reduce stormwater runoff by installing green infrastructure (GI) such as green roofs, bioretention, permeable pavement, and rainwater harvesting systems. GI helps protect the Anacostia and Potomac Rivers and Rock Creek. DC Water also offers a similar incentive program for its customers to earn a discount of up to 4% off the Clean Rivers Impervious Area Charge  (IAC).

Using one application, District residents, businesses, and property owners can apply for discounts through RiverSmart Rewards and the Clean Rivers IAC Incentive Program. Discounts are based on the stormwater retention volume achieved and are posted to DC Water bills.

## Stormwater Management Incentives Program Grant



This program offers **grant funding** to non-residential PWD customers for the design and construction of stormwater projects.

## Greened Acre Retrofit Program Grant



This program provides **grant funding** to companies or contractors to construct stormwater projects across multiple properties in Philadelphia's combined sewer area.



## **Building Green: What Sarasota County Does**

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Sarasota County embraces a leadership role in building green. By incorporating energy efficiency, renewable energy and water conservation into our county buildings, Sarasota County is able to save energy and taxpayer dollars at the same time.

We also offer private sector **incentives** for green building and green development through our Planning and Development Department, resulting in the planning, construction and development of sustainable buildings.

## HOW DOES THE BOULEVARD RAIN GARDEN PROGRAM WORK?

### For Street Reconstruction Projects Only

#### Step 1: Sign up for a rain garden

Mark "YES" on the project questionnaire to sign up for a rain garden. An engineer will evaluate your location later to make sure a garden will work. Sometimes gardens cannot be put in due to underground utilities or steep slopes.

#### Step 2: City constructs your garden

During street reconstruction, a contractor will dig a depression and prepare the soil so it is loose and fluffy. Most gardens will have a rock infiltration sump under the garden. This "rock baggie" helps water infiltrate quickly.



#### Step 3: Select a garden design

In fall after construction, residents select one of seven different garden designs: Easy Shrub Garden, Easy Daylily Garden, Sunny Garden, Sunny Border Garden, Butterflies and Friends, Minnesota Prairie Garden, or Shady Garden.

**Coming in Fall 2007—3 new garden designs!** Residents requested more formal gardens so our landscape designer is creating 3 new designs we'll unveil for the Desoto-Skillman project.

#### Step 4: Plant the garden

The spring after construction, residents plant their rain gardens. The city provides plants and hosts a planting day with



demonstrations and visits to all gardens to answer questions.

#### Step 5: Maintain your garden

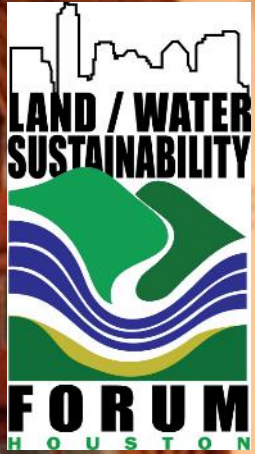
Once the gardens are planted, residents are responsible for maintaining them. City staff provides educational support and consultations when needed. Most of the gardens are relatively low-



maintenance. But all the gardens require some weeding, watering the first year, and annual cutting back.

**Help keep the ponds and wetlands in your neighborhood clean.**

**SIGN UP FOR A RAIN GARDEN!**



## ADDITIONAL INFORMATION

- EPA, 2012. *Encouraging Low Impact Development*. EPA-841-N-12-003G. Environmental Protection Agency, Washington, DC.
- EPA, 2009. *Managing Wet Weather with Green Infrastructure, Municipal Handbook, Incentive Mechanisms*. EPA-833-F-09-001. Environmental Protection Agency, Washington, DC.
- Struck, Scott, 2008. *Incentives for Adoption of LID Approaches on a Larger Scale*. American Society of Civil Engineers, Washington, DC.



# QUESTIONS?

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