



## Low Impact Development: The Houston Experience

## LID in Houston 2007

'It'll never work here.

We have heavy clay soils, flat land,  
intense rain events and too much  
annual rainfall.'

['They don't have these conditions in....']

## The HLWSF Steering Committee Those with a 'Vested Interest'

**American Institute of Architects**

HOUSTON CHAPTER

**American Society of Civil Engineers**

HOUSTON CHAPTER

**American Society of Landscape Architects**

## Common Understanding

- ❖ Costs of traditional development are soaring
- ❖ Developing *'the way we've always done it'* is more and more counterproductive
- ❖ For local government, the costs of keeping pace with inevitable results of traditional development is major burden
- ❖ Change is inevitable
- ❖ Leadership role is better than the alternative



"OUR MISSION IS TO ENHANCE, ENABLE AND INTEGRATE SUSTAINABLE USE OF LAND AND WATER FOR THE HOUSTON AREA'S CONTINUED GROWTH AND ECONOMIC VITALITY."

## Gaps that Needed to be Filled

- ✓ Gaps between disciplines
  - Use of integrated design teams limited
- ✓ Gaps in education
  - Focus on our soils, climate, topography
- ✓ Focus on 'nuts & bolts'
  - Practical application rather than the theoretical
- ✓ Individual constituent groups limited
  - Inherent tendency toward narrow focus

## HLWSF Founded in 2007

- Programming on sustainable development practices began February 2008
  - 'Levelers'
  - Workshops
  - Local Case Histories
- Program facilities inevitably filled to capacity
- Education is good, 'nuts & bolts' are the key

## Objective

Explore the adaptation & implementation of sustainable development practices

**LOW IMPACT DEVELOPMENT (LID)**

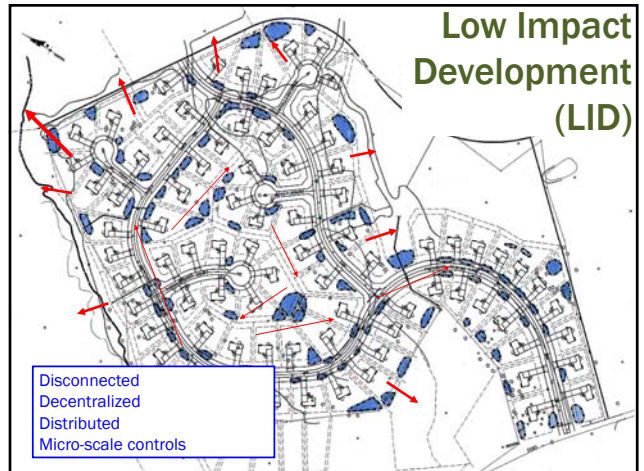
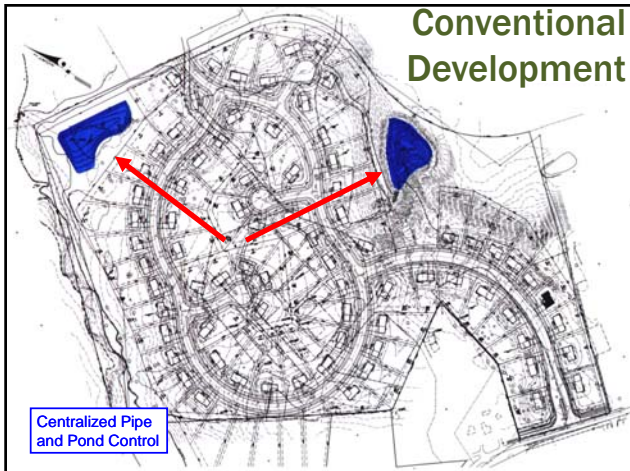
**GREEN INFRASTRUCTURE**

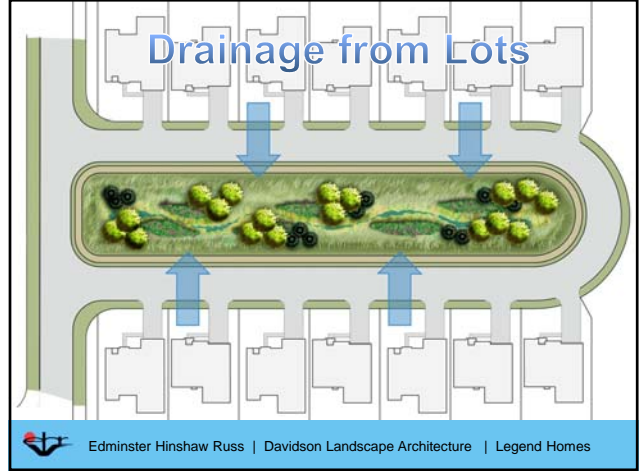
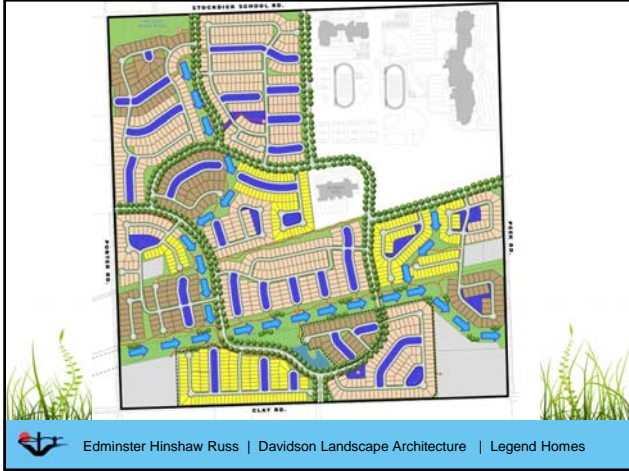
Can these practices be market-driven?

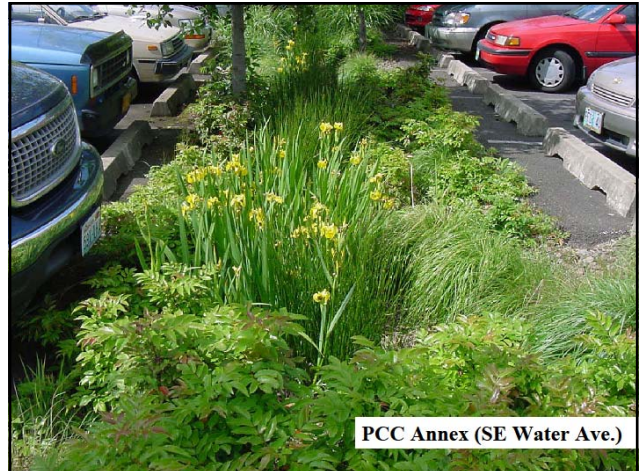
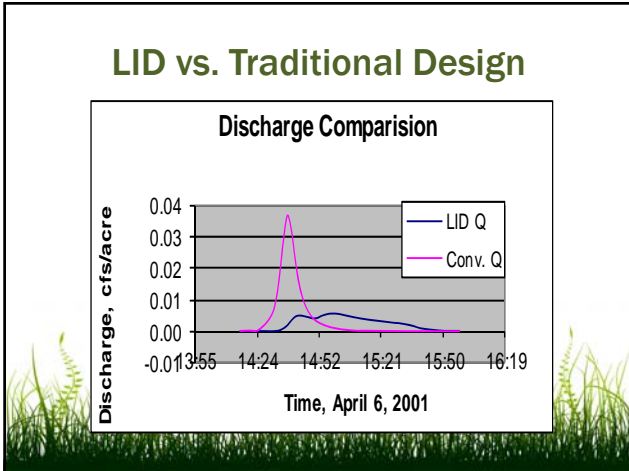
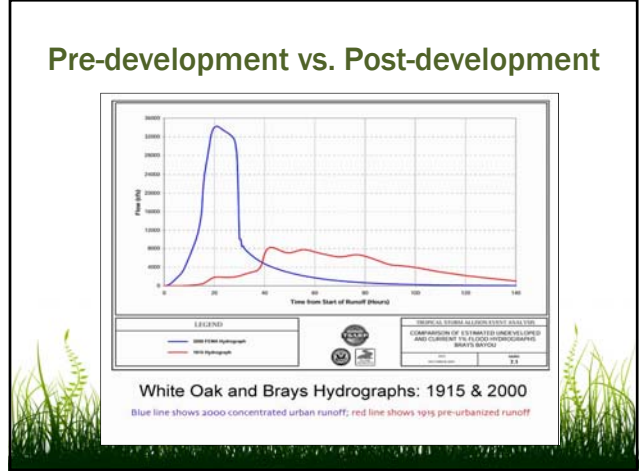
## What We Learned

## Low Impact Development (LID)

- Decentralized water management
  - Micro scale controls
  - 180° shift from centralized approach
- Toolbox that provides opportunities to make a developed property function hydrologically like an undeveloped property
  - Mimic nature to achieve water management goals











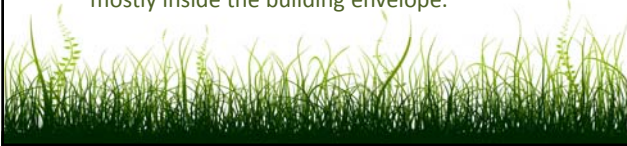
Driving Change



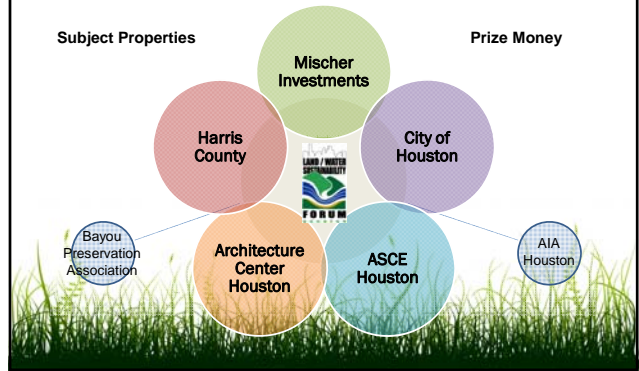
**LOW IMPACT DEVELOPMENT**  
**Design Competition**

### Why a Design Competition?

- Resolve the ‘chicken or the egg’ syndrome
  - How comfortable are you with proposing new methodology if you’ve never used it?
- Prevent more ‘missed opportunities’ on LEED® project sites
  - Sustainable elements in Green Buildings are mostly inside the building envelope.

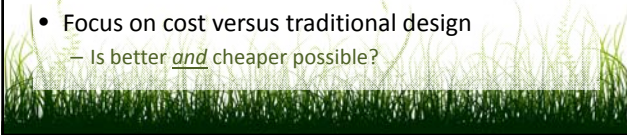


### Key Players Must Have ‘skin in the game’

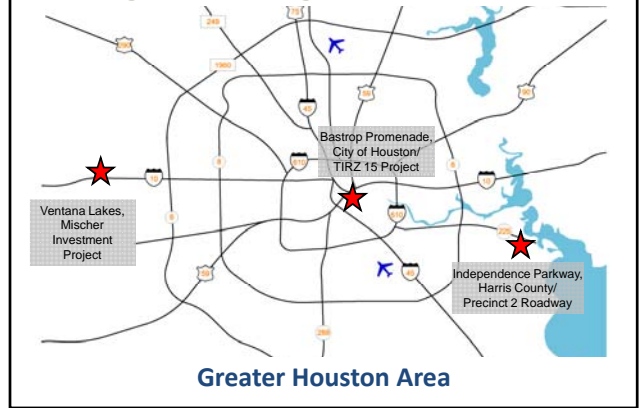


### What We Wanted To Accomplish

- Promote integrated design teams
  - Key to genuinely sustainable design
- Use real properties with challenging conditions
  - Enable knowledge transfer, viable LID adaptations
- Focus on runoff reduction and attenuation
  - Post-construction hydrograph must be below pre-developed condition for 5, 10 and 100 year events
- Focus on cost versus traditional design
  - Is better *and* cheaper possible?



### Design Challenge Properties Map





## Green Roadway Independence Parkway




- Basis for county 'green' roadway standard section?
- Reduce runoff?
- Reduce costs?

## Green Roadway Finalists

Team 07187	Team 07189	Team 07181	Team 07185
<b>AECOM</b> Sid Edmonds, Jim Sipes, Russell Bynum, Jennifer Hundl, Ross Gordon, June Tsou, Adam Guerra, Young-Ae Chung, Anna Hansen, John Sexton, Kurt Smith	<b>Klotz Associates</b> Les Pittman, Mary Keilers, Ed Conger, Brent Baldwin, Katherine Mears, Justin Mickey, Erin Dozal, Jennifer Steen, Morena Arrendondo, Ilene Warmke, Mike Wheeler, Yasmin Martinez, Andres Juarez, Fergus Graham, Rick Carle, Chris Williams  <b>Clark Condon Associates</b> Rebecca Pittman, David Daughtry, Courtney Landreth, Jason Rainosek	<b>Edminster Hinshaw Russ</b> Justin Ring, Raymond Chong, Staci Duncan  <b>Davidson Landscape Architecture</b> Kolby Davidson	<b>Pate Engineers</b> Keith Young, Allen McKee, Terri Crauford  <b>TBG Partners</b> Sean Compton, Kimberly Doerle, Matt Jagunic, Amy Harr, Travis Crow  <b>Lady Bird Johnson Wildflower Center</b> Steve Windhager, Julie Ralsch, Emily Manderson, John Hart Asher II

## Urban Redevelopment Bastrop Promenade

TRZ 15 Visioning Session Report Gender



- Accommodate existing undersized infrastructure?
- Reduce runoff?
- Reduce costs?

## Urban Redevelopment Finalists

Team 21182	Team 21184
<b>Edminster Hinshaw Russ</b> Justin Ring, Christopher Browne, Staci Duncan  <b>Llewelyn-Davies Sahn</b> Randhir Sahni, James Anderson, Ranjan Roy, Alex Arzu, Raul Hernandez, Bobbi Nasso  <b>Davidson Landscape Architecture</b> Kolby Davidson  <b>T.O.D. Houston</b> Dr. Audrey Trotti, James Phelan	<b>Walter P. Moore</b> Kevin Sullivan, Gareth Young  <b>Gensler</b> Rives Taylor, David Williams, Kim Kelly, Lisa Graiff  <b>Clark Condon Associates</b> Josh LaMartina, Ethan Primm, Matt Dawson, John Schnure, Paul Weathers, Elizabeth Gilbert, Riley Anderson  <b>Dan Pope Associates</b> Dan Pope



### Suburban Residential Finalists

na Lakes

- Reduce runoff?
- Reduce costs?
- Improve marketability?
- Improve quality of life?

**VENTANA LAKES SITE PLAN A**

### Suburban Residential Finalists

Team 19184	Team 19183	Team 19189
<b>Jones &amp; Carter</b> Thomas Stroh <b>MCCM Architects</b> Richard Cate <b>KGA DeForest Design</b> Robert DeForest <b>Kerry R. Gilbert &amp; Associates</b> Kerry Gilbert	<b>Brown &amp; Gay</b> Paul Dodd, Karena Hauter, Lance McLeod, Geoff Freeman, Tracy Youngblood, Ronnie Harris <b>SWA Group</b> Kevin Shanley, Matt Baumgartner <b>InSite Architecture</b> Antonio Flamenco	<b>Edminster Hinshaw Russ</b> Justin Ring, Christopher Browne, Staci Duncan <b>Legend Home Corp.</b> David Carlson <b>Davidson Landscape Architecture</b> Kolby Davidson

### Participant Demographics

- 22 submitting teams
  - 9 Green Roadway
  - 4 Urban Redevelopment
  - 9 Suburban Residential
- 42 firms (TX, IL, NC, GA, CO, CA, KS)
- 230 design professionals
  - Architects, Civil Engineers, Landscape Architects, Hydrologists, Urban Planners, Construction Consultants, Homebuilders, Environmentalists, Transportation Engineers, Irrigation Consultants

### Stage One Judges

Subject Matter Experts and Influencers

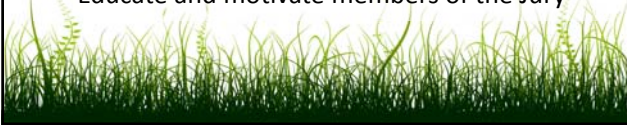
<b>CIVIL ENGINEERING</b> Arthur L. Storey, PE Executive Director, Harris County Public Infrastructure Division	<b>LANDSCAPE ARCHITECTURE</b> Dana Nunez Brown, ASLA Principal, Brown + Danos Landdesign Inc. Baton Rouge, LA
<b>LOW IMPACT DEVELOPMENT</b> Larry Coffman President, Stormwater Services Group Chesapeake Beach, MD	<b>ARCHITECTURE</b> Greg Papay, FAIA Principal, Lake Flato Architects San Antonio, TX
<b>HYDROLOGY</b> Stephen Costello, PE Principal, Costello Inc. and City Councilman, Houston, TX	<b>RESIDENTIAL DEVELOPMENT</b> Ted Nelson Regional President, Newland Communities, Houston, TX

## High Profile Finals Event

- Crystal Ballroom at the Rice filled to capacity
- Maximize number of finalist presentations
- Seven minute 'lightning' format
- Fast pace equals excitement (NASCAR effect)

### SECONDARY GOAL

Educate and motivate members of the Jury



## Stage Two Judges

### DEVELOPERS AND LOCAL GOVERNMENT LEADERS

<b>Amer Al-Nahhas</b> President SpawGlass Civil Construction	<b>Bill Huntsinger</b> Vice President-Planning Metro National Corporation
<b>Frank Liu</b> Principal Lovett Homes	<b>Ian Powell</b> President-Elect, AIA Houston PBK Architects
<b>Jimmy Pappas</b> Principal Corinthian Development	<b>Ralph DeLeon</b> TIRZ 15 Program Manager City of Houston TIRZ 15
<b>Richard Johnson</b> Director of Sustainability Rice University	<b>Christopher Gilbert</b> Project/Construction Manager General Growth Properties, Inc.
<b>Dan Gilbane</b> Development Manager Gilbane Building Company	<b>Andrew Steffen</b> Project Manager Hines Interests



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### Stage Two Judges

**DEVELOPERS AND LOCAL GOVERNMENT LEADERS**

<b>Commissioner Sylvia R. Garcia</b> Harris County Precinct 2 Commissioner	<b>Doy Weitman</b> Chief, Nonpoint Source Control Branch U.S. Environmental Protection Agency
<b>David Nussbaum</b> Vice President-Development Mischer Investments, LP	<b>Terry Hershey</b> Board Member Bayou Preservation Association
<b>Mike Talbott</b> Director Harris County Flood Control District	<b>John Blount</b> Director of Architecture & Engineering Harris County Public Infrastructure Dept.
<b>Perry Senn</b> Principal Peron Development	<b>Ed Wulfe</b> President Wulfe & Company
<b>David Hightower</b> Exec. VP & Chief Development Officer The Wolff Companies	<b>Carol Ellinger Haddock</b> Sr. Asst. Director PW&E, City of Houston American Society of Civil Engineers - Houston



### Consistent Outcome

- Conservative civil engineering firms proselytize for 'green infrastructure.'
- Mimicking nature really works
- Major reductions in runoff
- Significant cost savings when compared to traditional development methods
- Unequaled water quality benefits

### Notable Comments

‘We were surprised when we got the hydrology modeling report, but when we saw the economics we were stunned. I called my guys in last Friday and told them that we’re pitching our new projects this way.’

— PRINCIPAL, ONE OF HOUSTON’S MOST PROMINENT ‘OLD SCHOOL’ CIVIL ENGINEERING FIRMS

### Notable Comments

‘I was one of the finalist judges down there, and it ranks among the most exhilarating experiences of my 31-year career at EPA....I truly think that if we could replicate this event in every state, we could revolutionize development in this country....The most exciting part was that so many people involved had no background in LID prior and came out the other end believers and even proselytizers. Truly remarkable.’

— DOV WEITMAN, CHIEF, NONPOINT SOURCE CONTROL BRANCH, EPA

### Lessons Learned

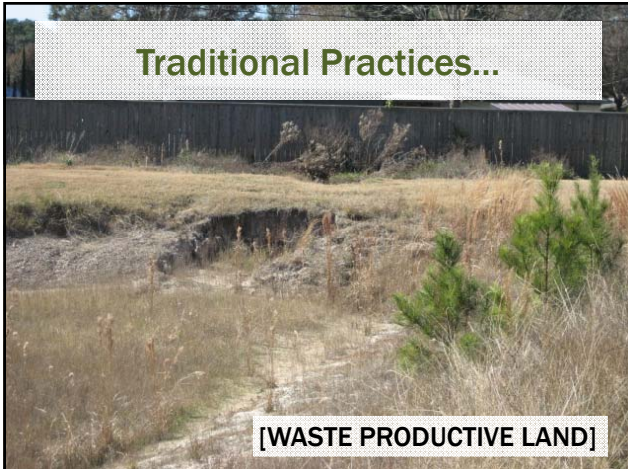
- Pressure from peers and local government got participants in the game
- Integrated teams will survive and thrive afterwards
- Opportunity to learn by doing critical to accelerating change
- Economics favor LID design
- LID is a superior design approach even when Water Quality is a secondary goal

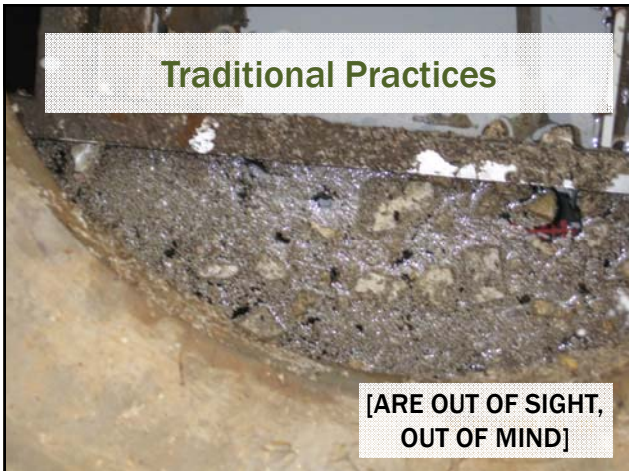
### Post-Competition Implementation Soars

### Expedite LID Permitting

- Eliminate 'fear of delay' for developers
- Acknowledge and deal with obstacles in the code
- Collaborative LID Permitting Design Criteria Workshops held in June, July & August 2010
  - Engineers, landscape architects, architects together with city, county and flood control district staffs

But what about maintenance?





### Getting LID Projects Permitted

- Collaborative Workshops output distilled into Proposed LID Design Code
  - Interim LID Design Guide
  - Harris County and Harris County Flood Control District
  - April 19, 2011
- Approach will allow rapid implementation and maximum experience for all parties
- Future code to be based on 'interim' experience



### 2010-11 Houston LID Projects

More than 100 Submitted

- Green Roadways
- Libraries
- K-12 Schools
- Office parks
- HQ Campus
- Suburban Residential
- Master Planned Community
- Urban Residential
- Fire Station
- Universities
- Parks
- Multi-Family

### 1<sup>st</sup> Anniversary Party LID Design Competition

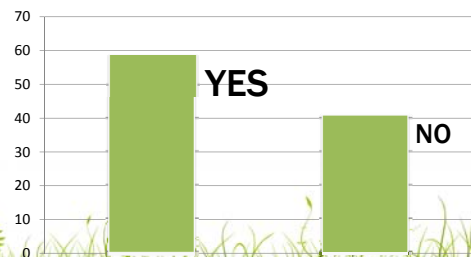
#### COMPETITION PARTICIPANT SURVEY

Have you had opportunities to implement LID practices since the Competition?

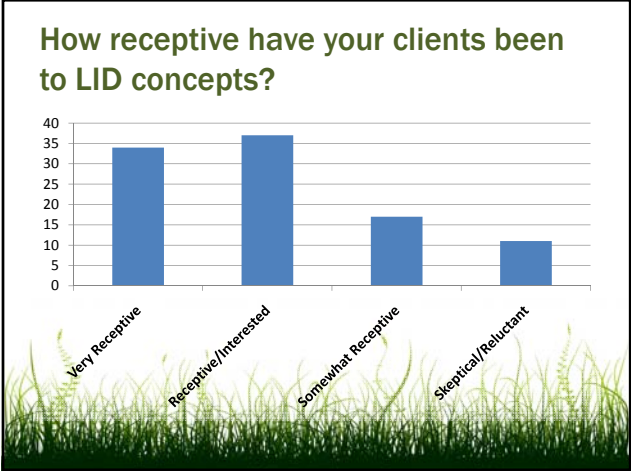
What obstacles have you experienced when designing or permitting a LID project?

Have your clients been receptive to LID?

### Have you had opportunities to implement LID since the Competition?







### Change is Good When It...

- Saves money on infrastructure construction and maintenance costs
- Makes development more livable, attractive and marketable
- Improves and protects our environment
- Eases the burden of meeting regulatory requirements

### 2011 Houston Land/Water Sustainability Forum

- Local agency 'Interim' period guidelines launch session
- Collaborative Workgroup to provide guidance to landscape design for Green Roadways
- Developing LID-based project tracking system and clearinghouse for data
- Joint LID education with developer groups aimed at bringing them up to speed

# Resources



[www.houstonLWSforum.org](http://www.houstonLWSforum.org)

