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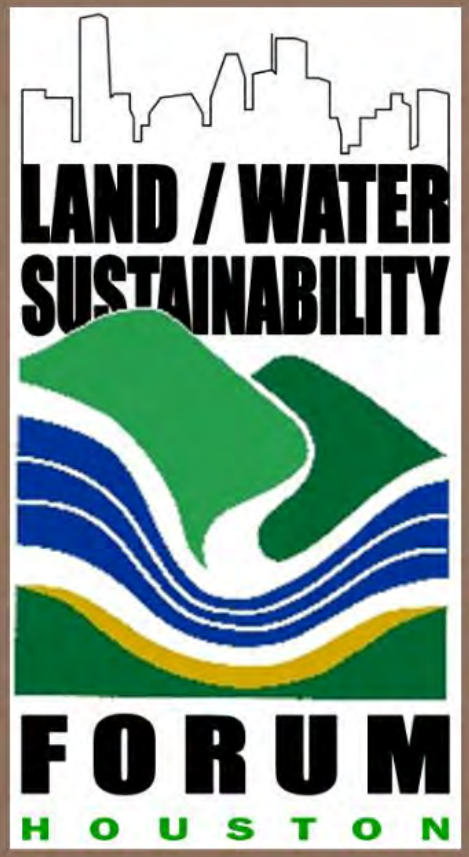
How do you move a huge community with no regulatory driver from gray infrastructure poster child to Low Impact Development model in 3 years?

driving change

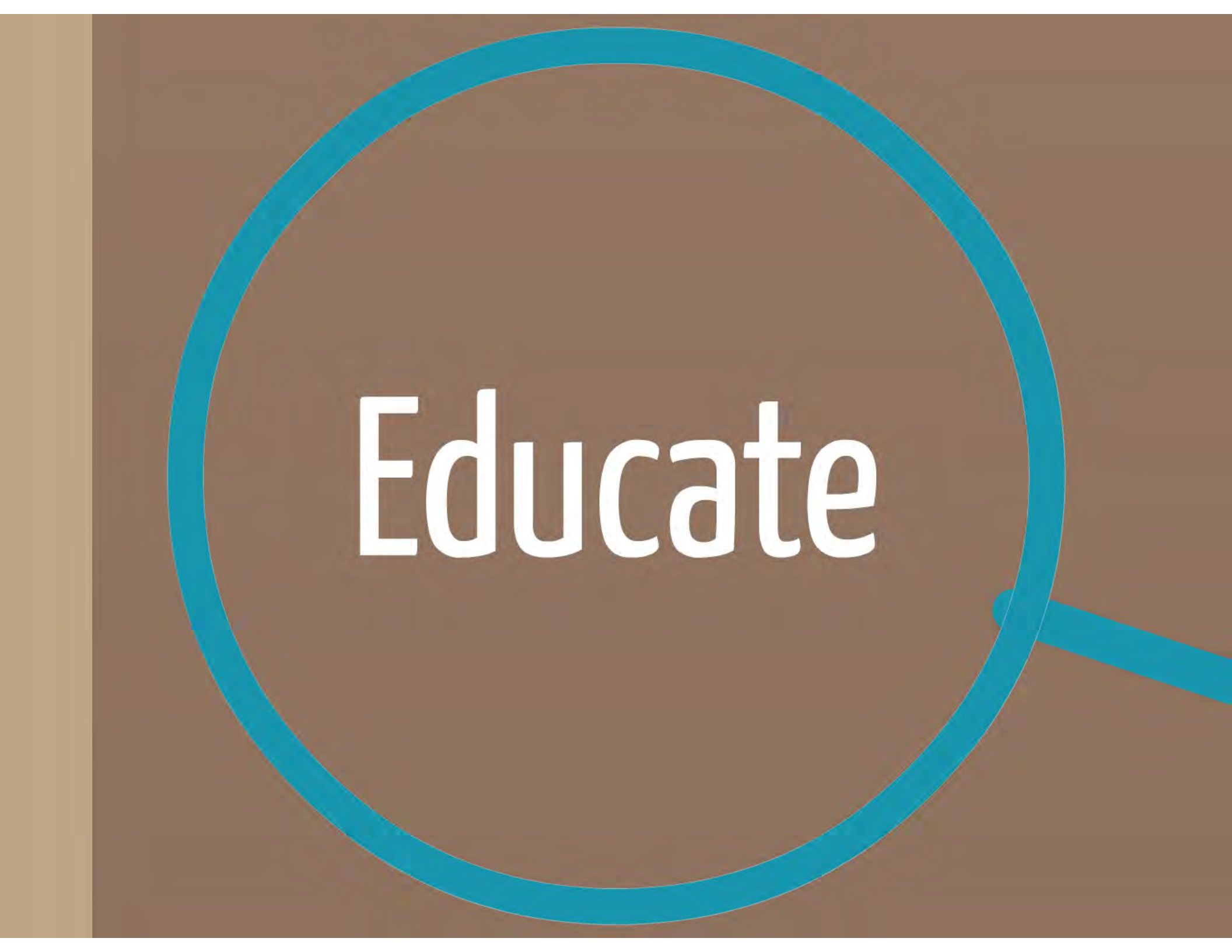


"OUR MISSION IS TO ENHANCE, ENABLE AND INTEGRATE SUSTAINABLE USE OF LAND AND WATER FOR THE HOUSTON AREA'S CONTINUED GROWTH AND ECONOMIC VITALITY."

Collaborate

The HLWSF Steering Committee
Those with a 'Vested Interest'

American Institute of Architects
American Society of Civil Engineers
American Society of Landscape Architects
Associated General Contractors
Bayou Preservation Association
City of Houston
Energy Corridor District
Greater Houston Builders Association
Harris County Public Infrastructure Department
Harris County Flood Control District
Houston Council of Engineering Companies
Houston-Galveston Area Council
International Erosion Control Association
Texas Department of Transportation
United States Green Building Council


Educate

The state of LID/GI adoption…

- Near zero local knowledge base related to LID
- Essentially no LID implementation
- Stormwater quality requirements dramatically lower than most places
- Flood control dominates stormwater thinking

LAND / WATER SUSTAINABILITY FORUM HOUSTON

LOW IMPACT DEVELOPMENT

Design Competition

Catalyst

The Basics

- Integrated design teams required
- Real programatic and site information, from real owners
- Three primary local development types
- Real, typical properties, replicable results
- Cost comparisons between LID and traditional designs for each property

Use Market Forces

Economics as a Driver?

- **ABSOLUTELY**
- **Every competition entry found LID less expensive than traditional approach for the same project**
- **Every team found LID better for the client in every way**

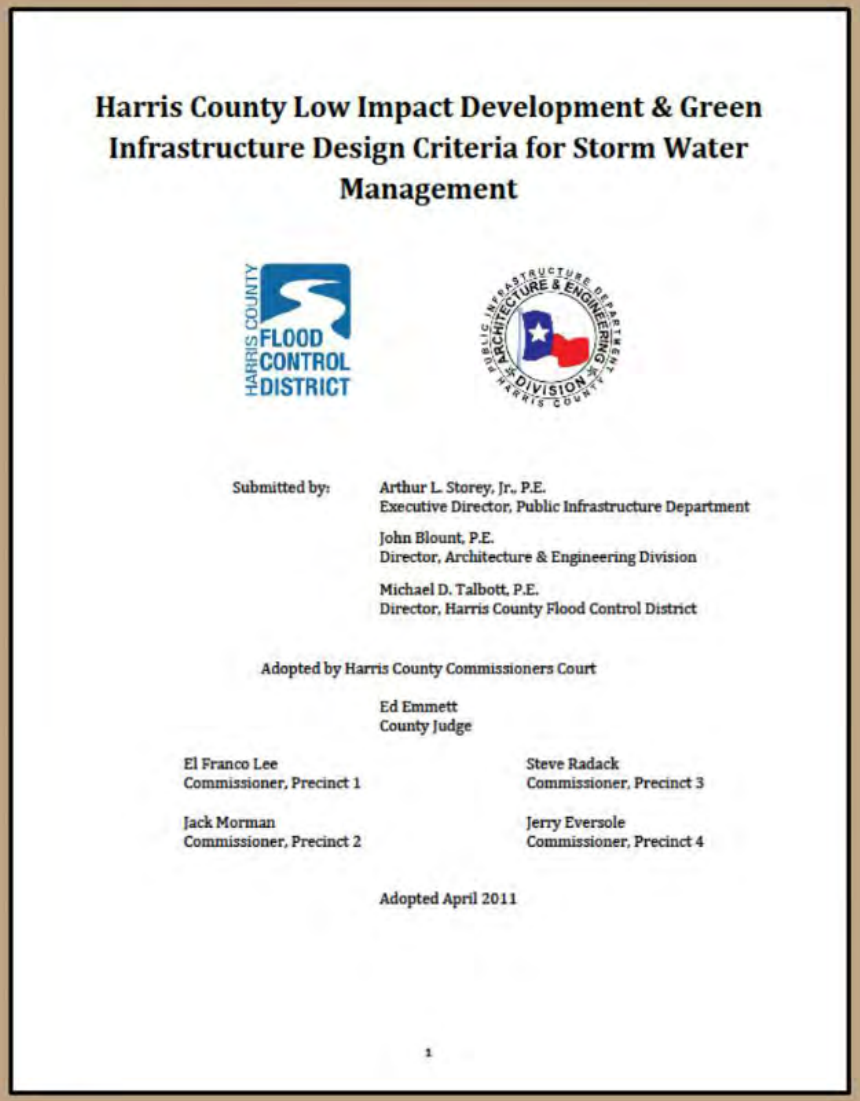
Other Consistent Results

You roll the dice and take your chances. It's sweet when it all works out.

- Major reductions in runoff were almost always possible
  - The post-development property can function hydrologically like the pre-developed property
- Mimicking nature really works
- Conservative civil engineering firms proselytize for 'green infrastructure.'

Expedite

Expedited LID Permitting



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

HARRIS COUNTY FLOOD CONTROL DISTRICT

PUBLIC INFRASTRUCTURE DEPARTMENT HARRIS COUNTY ARCHITECTURE & ENGINEERING DIVISION

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

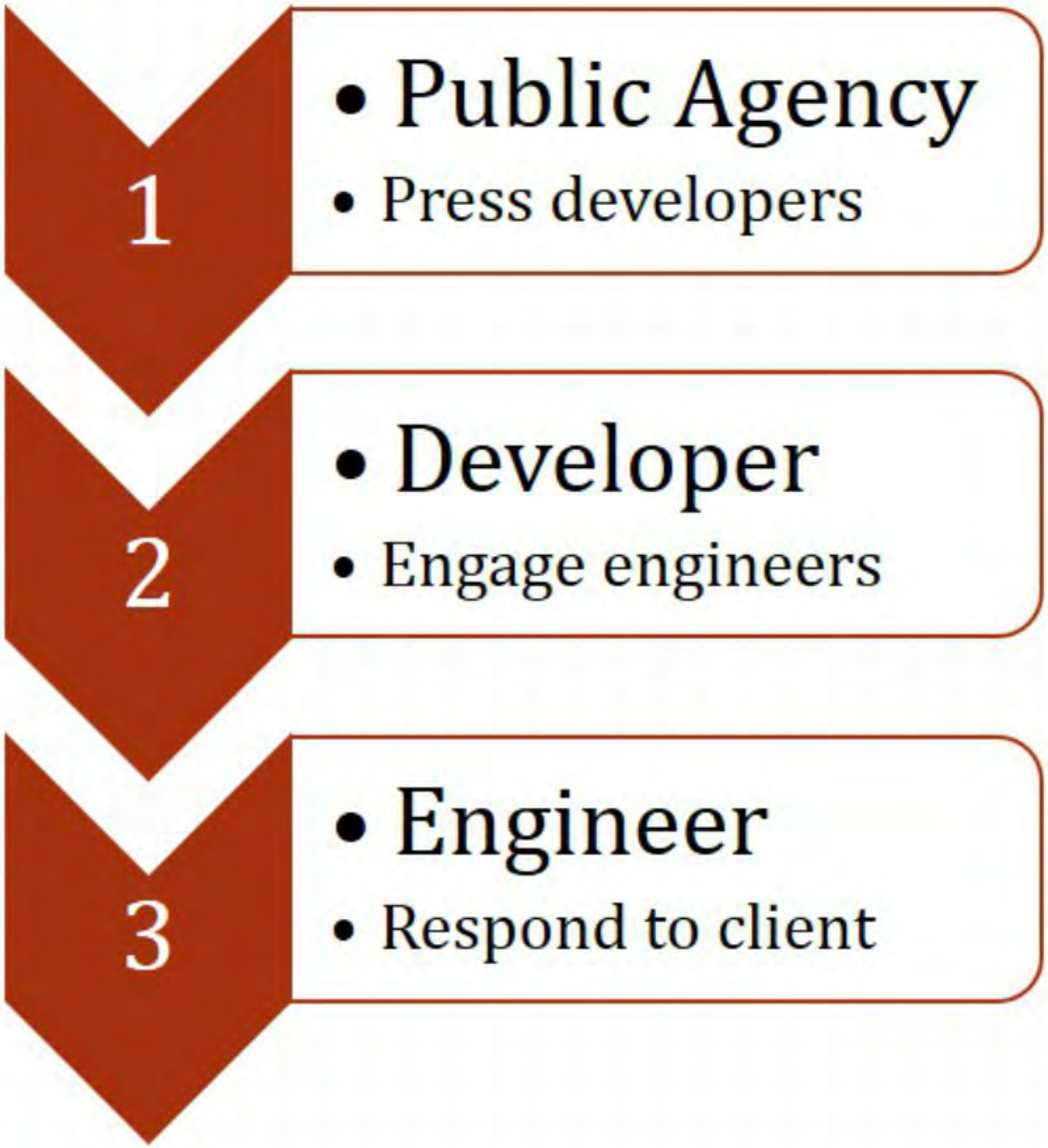
Adopted April 2011

1

- Collaborative and expedited permitting process
- Innovation friendly
- Drove rapid implementation and maximizing learning experience for all parties
- Crucial to implementation
- Future code to be based on 'interim' experience

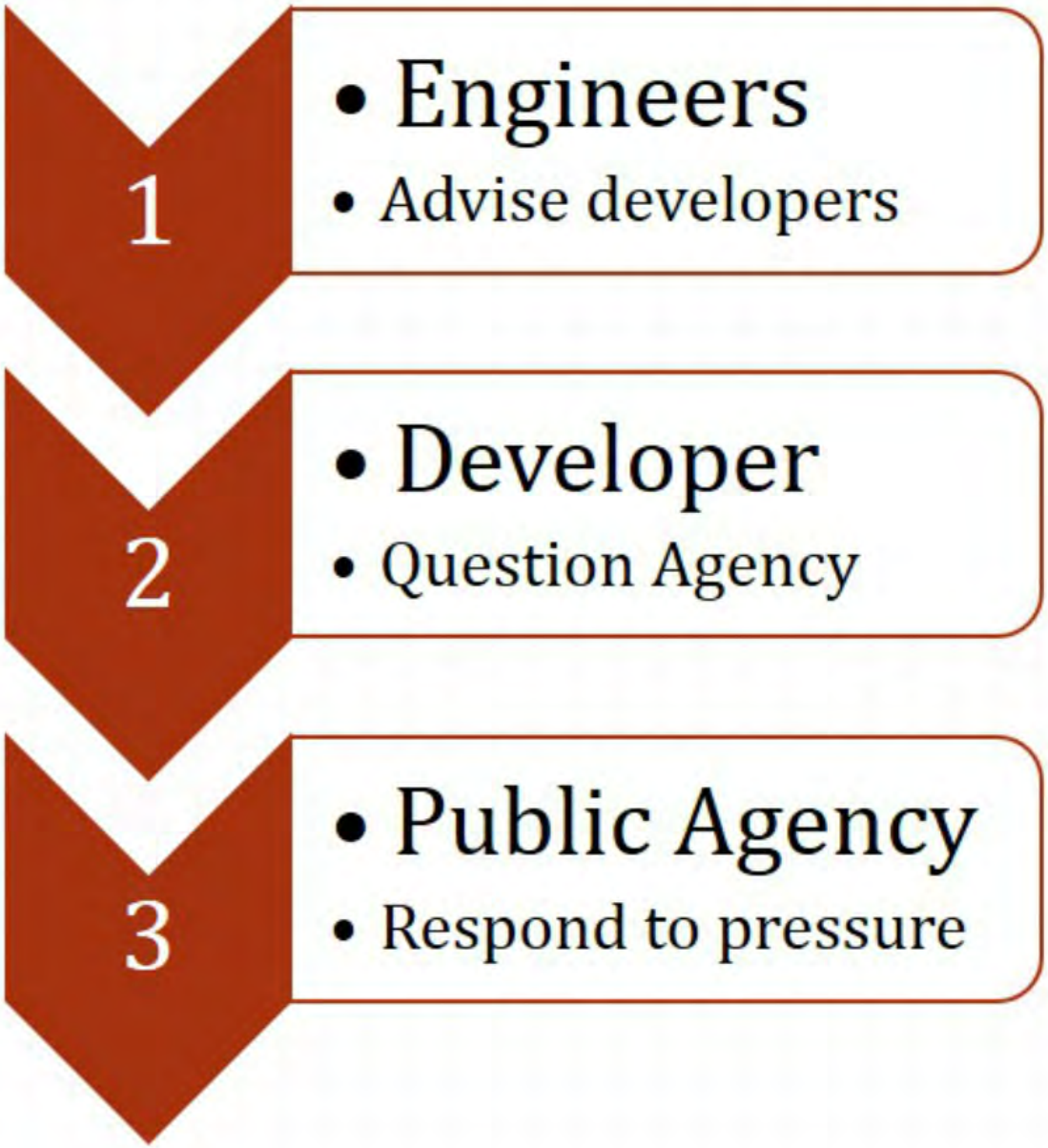
Traditional Approach to LID Adoption

Uses regulatory pressure to drive change.



The Competition Approach

Uses market forces to drive change.

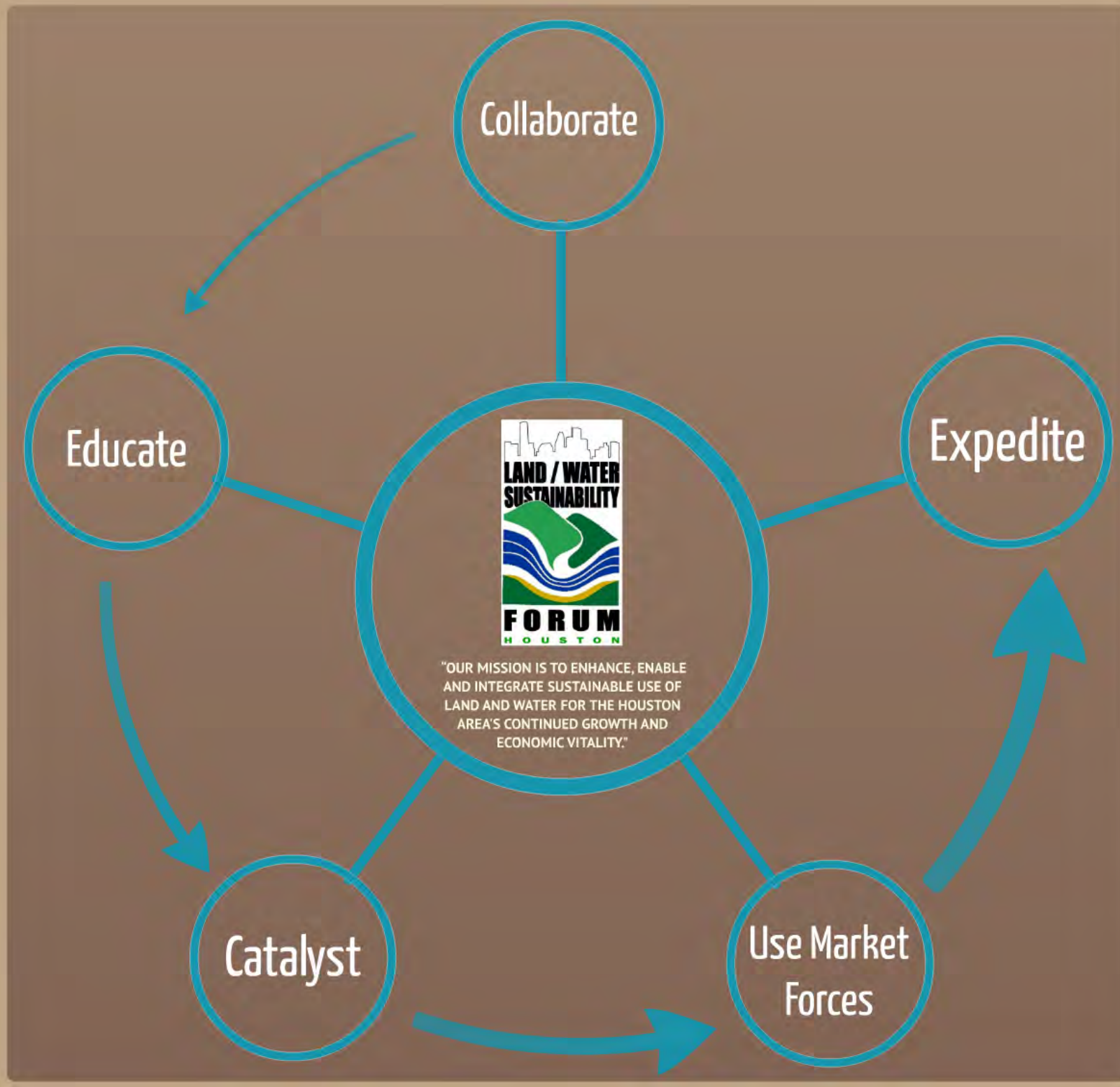


The state of LID/GI adoption... AFTER

- Local know-how and LID-based project count grew exponentially
- Engineering firms moved rapidly to LID focus
- Collaborative teams fostered long term working relationships between disciplines
- City and County have definite bias towards LID-based public projects
- Competition participants became leaders in the new marketplace

What was the overall impact?

- Drove a ‘make it happen now’ approach in local government as well as design community
- Hundreds of LID-based projects in play, of all sizes
- This competition model has been, is being followed by communities across the country to drive change


Collaborate
Educate
Expedite
LAND / WATER SUSTAINABILITY FORUM HOUSTON
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Catalyst
Use Market Forces

AND NOW FOR SOMETHING
COMPLETELY
DIFFERENT.

2 A personal soapbox event

What Will It Take to Drive Widespread Implementation of Large Scale Rainwater Harvesting?

got technology?

In a word....

ECONOMICS

It worked for Low Impact Development.

How Many Rain Barrels Does It Take To Make a Difference?

And,
another word....

SCALE

YouTube

Why Don't Commercial Developments Implement Rainwater Harvesting Now?

Typical payback period is 20 years

Why Waste the Water In Detention Facilities?

The Detention Facility Must Be Empty Before the Next Rain Event

Rainwater is temporarily stored as it's collected from the site during a rain event and typically drains out of the pond within 48 hours.

'Catch and Release' Stormwater Rules

Huge Opportun Missed

Typical Commercial Developments must provide facilities to detain .5 Acre Feet to 1 Acre Foot for every Acre developed.

.5 ACRE FOOT = 162,925 GALLONS

1 ACRE FOOT = 325,851 GALLONS

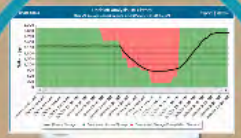
Dual Use Detention-Harvesting Facilities Can Change the Future of Rainwater Harvesting

Why Will Commercial Developments Implement Dual Use Harvesting?

Typical paybackperiod 4-5 years

Simple Off the Shelf Technology

Used for decades in SCADA applications in many industries

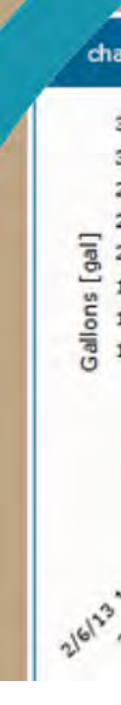


NWS Micro Forecasts

15 minute updates on 2.5 Sq Mile grid

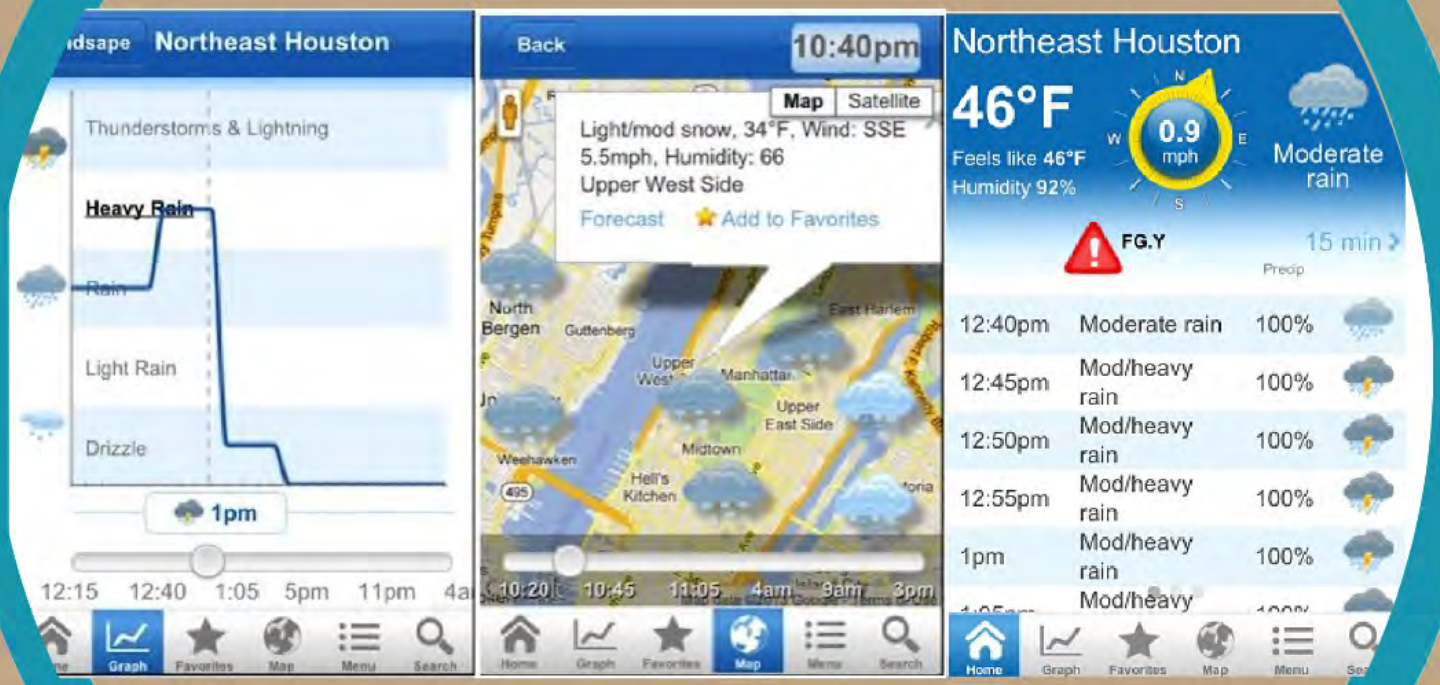
Simple Off the Shelf Technology

Used for decades in SCADA applications in many industries



Thunderstorms
Heavy Rain
Rain
Light Rain
Drizzle
12:15
12:40
Graph

NWS Micro Forecasts



15 minute updates
on 2.5 Sq Mile grid

ADA
ny

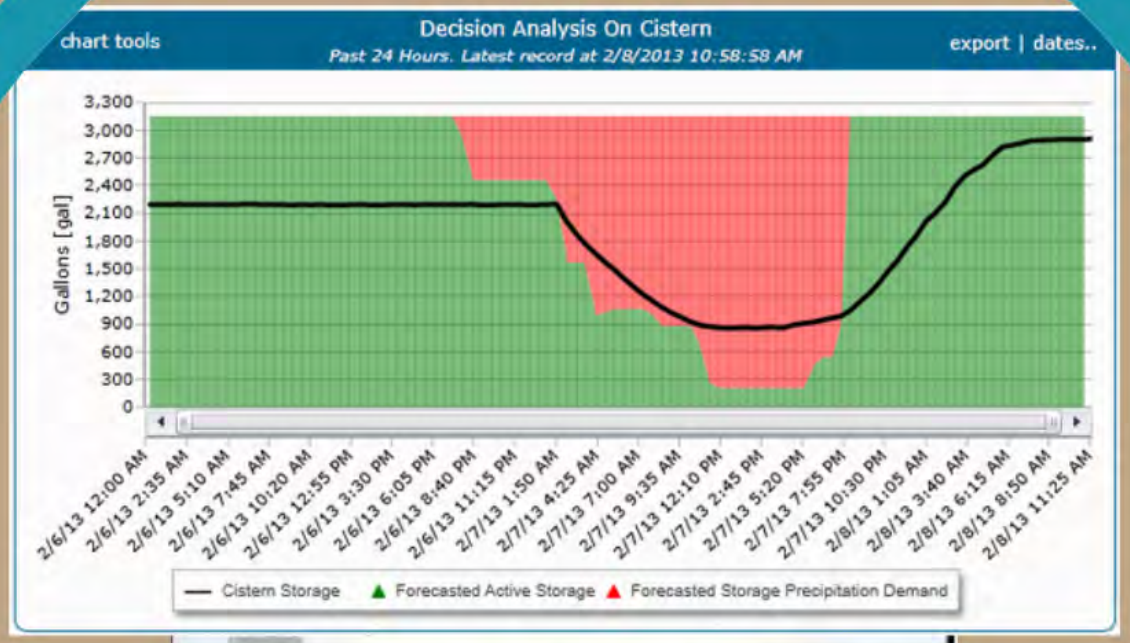


chart tools
Decision Analysis On Cistern
Past 24 Hours. Latest record at 2/8/2013 10:58:58 AM
export | dates..
Gallons [gal]
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3,000
2,700
2,400
2,100
1,800
1,500
1,200
900
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300
0
2/6/13 12:00 AM
2/6/13 2:35 AM
2/6/13 5:10 AM
2/6/13 7:45 AM
2/6/13 10:20 AM
2/6/13 12:55 PM
2/6/13 3:30 PM
2/6/13 6:05 PM
2/6/13 8:40 PM
2/6/13 11:15 PM
2/7/13 1:50 AM
2/7/13 4:25 AM
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2/7/13 12:10 PM
2/7/13 2:45 PM
2/7/13 5:20 PM
2/7/13 7:55 PM
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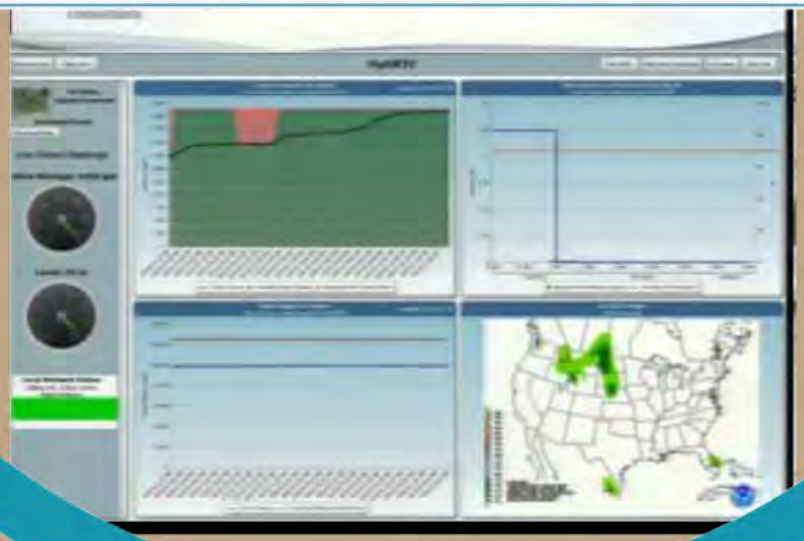
Forecasted Storage Precipitation Demand



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got technology?

What if the storm water industry thought like the technology industry?

"INNOVATE or DIE"

Robert Adair
President, Construction EcoServices
Steering Committee Chair
Houston Land/Water Sustainability Forum
adair@ecosvs.com