



Driving Adoption, Adaptation and Implementation of Low Impact Development: The Houston Story

The following synopsis of the Houston Land/Water Sustainability Forum's Low Impact Development Design Competition, which concluded in January 2010, was written by Dov Weitman, Chief of the EPA's Nonpoint Source Control Branch, and widely distributed via e-mail on his return to Washington. This message is shared with Mr. Weitman's permission.

RE: "Amazing Houston LID Competition"

I want to let all of you know about an incredible, energizing experience I had last week in Houston. I participated as a member of the Jury Panel for the Finals Event in the Houston Land/Water Sustainability Forum's Low Impact Development Competition on January 27. The bottom line is they just implemented an amazing consciousness-raising process that has hundreds (at least) of developers, civil engineers, architects, landscape architects, etc., thinking differently about stormwater than they did 6 months ago. And the way they did it seems to me to be replicable in cities across the country. I hope you'll read on, follow up on a couple of the links, and think about what you could do in a particular city or state.

First, as general background, here is the Forum's Mission Statement:

"Our mission is to enhance, enable and integrate sustainable use of land and water for the Houston area's continued growth and economic vitality."

"Across this country and the world, new ideas, methods, materials and technologies aimed at positively impacting the sustainability of land and water resources have been widely adopted, some are even being developed right here in Houston. This forum has been formed to provide exposure to the full range of these practices, to encourage their adoption, their adaptation where needed for the conditions found in our community—and to foster creativity in both the development of new solutions and the regulatory infrastructure that enables them."

"Maintaining the pace of growth and development in the greater Houston area requires that those with a vested interest adopt new ideas and employ new methods that will insure that growth can be sustained. The forum seeks to engage the broadest possible range of constituent groups, in a collaborative effort that focuses on practical application rather than abstract theory in the exploration of incremental answers to some of the Houston area's most significant land/water sustainability issues."

As you can see, this is not an LID forum or WQ forum. But the Forum (which consists largely of organizations and people concerned with boosting Houston's economic growth and sustainability, including businesses, nonprofits and local government) had the vision to recognize the role that LID can play in the Houston area's growth and economic vitality. They decided that a competition to develop the best LID project(s) would be a great way to publicize the issue and increase the comfort of professionals to propose LID projects to their clients. They expressed their goal as follows:

"Our goal in this competition is to dramatically accelerate the adoption, adaptation and implementation of Low Impact Development and other sustainable development practices in the Houston area."

They implemented the entire process in 5 months. They launched it in September 1, implemented a semi-final process, and then held the "finals" on January 27. They identified 3 actual projects that will be implemented in Houston or Harris County (where Houston is located), and solicited the submission of proposed LID plans for one or more of these projects. Contest rules required that each applicant include a licensed civil engineer, architect, and landscape architect on their team. In the vast majority of cases, 3 or four firms would partner (e.g., a civil engineering firm, landscape architecture firm, and a developer). At the other end of the spectrum, at least one submittal was submitted by a single large company (AECOM) that had all of the required licensed professional staff in-house. A few teams included a partner from outside of Texas, but the vast majority of participants were from Texas, and most of those were based in the Houston area.

It is notable that, to date, Houston doesn't have many LID projects. There are a few green roofs (it seems like all of them are on medical facility buildings -- don't ask me why, maybe doctors are moved by the air pollution reduction benefits). **Most of the participants in this competition did not have experience designing or implementing LID projects, so the whole concept, and what it can accomplish, was a total eye-opener for many participants.** What brought them to the table was civic pride (I learned that there is a lot of that in Houston); the competitive urge; enhanced reputation; a hope to be hired to participate in implementation of the project; and \$15,000 in prize money to the winners in each of the 3 categories, provided by American Society of Civil Engineers; Architecture Center Houston Foundation; and Mischer Investments (a development company). (Houston's chapter of American Institute of Architects, and numerous other organizations, also participated.)

The three projects were:

1. Green Roadway: A re-development of a mile-long road/highway (expanding 2-lane to 4-lane of a road that has historic significance as well as proximity to a major tank farm near the water)
2. Urban Re-development: About 6 blocks of a street in East Houston that is intended to be a major redevelopment (complete with a large stadium, residences, shopping, restaurants, etc.) and provide a model for applying smart growth principles to redevelopment
3. Suburban Residential: A new square-mile development in Harris County

Much more detail on the structure of and rules pertaining to the competition is available at <http://www.houstonlwsforum.org/designCompetition/program.html#Judging>. I'll just mention a couple of key points about the rules: Applicants had to demonstrate that the hydrograph for their LID proposal matched or was below the conventional development option for the 5-year, 10-year, and 100-year storm. In addition, they were required to rely principally on LID to handle the stormwater. Thus, while some of us might prefer to have seen a matching of hydrographs for e.g., the one and/or two-year storms, their rules did have the effect of "forcing" reliance on LID approaches, and indeed a few proposals completely eliminated traditional infrastructure. There was provision for some non-LID storage of excess water in large storms for at least the suburban development (contest rules required identification of an outlet), whereas the green

roadway designs typically handled all water without any auxiliary storage. (I believe Houston's 90th percentile storm event is 1.8 inches, but I'm prepared to be corrected on this one. I couldn't quickly find out its 95th percentile.)

Another rule was that the LID alternative could not be more expensive than the conventional stormwater treatment alternative. More on that below.

22 teams entered the competition. These teams comprised 49 firms, and many firms had multiple participants in the projects. Indeed, when the three winning teams came up to the stage at the end of the evening to be awarded their prizes (big fake checks pending the real ones), they generally had more than 10 participants. I would estimate that there were 300-400 people in the room at the final presentation, and not all participants were present.

The Bottom Lines

1. Many of the participants (and apparently some of their CEO's) were blown away by the results of their own analyses, in particular the following:

a. LID can practices can in fact manage all or most storm events on site and can in fact replace traditional infrastructure.

b. LID is cheaper than or as cheap as the conventional alternative and provides so many attractive features that it is a "no-brainer" (in the words of one engineer in his presentation). The main savings identified were the elimination or reduction of pipe and pavement. One presenter also noted the savings in long-term maintenance -- i.e., no need to inspect and to pull up and replace aging pipes. The co-presenter for the winning submission in the suburban development category (who also participated on one of the green roadway submissions) told me later that he had never worked on LID before, and when his firm asked him to participate on the project he figured, OK, sounds interesting. And now that he's been through the project analysis and saw the cost savings, he appears to be a total evangelist for it.

2. Almost all of the teams "got" the aesthetic aspects of the project. Whether it was the green roadway, urban re-development, or suburban development, there were tons of green and colorful flowers thrown in and just great efforts to link the project to its setting. (One presenter in the Green Roadways competition proudly noted that their design would assure color in all seasons.) The winner of the suburban development competition placed so many rain gardens that the presenter stated that every property has a rain garden within close view of the front or rear of the house. The presenter also pointed out that one advantage of distributed LID practices is that it spreads the amenities throughout the development

3. Apparently, some CEO's/managers participated with the idea that was a good thing to do civically but it was not going to be a big deal and change the way they do business. After the work was done and their staff came to them to show the cost savings and aesthetic benefits, that was a real wake-up call. Several companies have already instructed their staff to promote future projects based on LID to their clients.

4. One fascinating thing: Among the 9 finalist presentations I saw and materials I read, nobody once mentioned the benefits that LID provide to protecting stream structure. I guess that's just not something

they think about when they look at the Houston Ship Channel! There was some recognition and discussion of pollutant reduction in several presentations; pride in reducing water use by X% by collecting and reusing rainfall; and lots of good feelings about saving on stormwater infrastructure. Even the suburban residential development presentations, which do have a small stream in the neighborhood (Ventana Run), never discussed hydrologic impacts on the water body. What this says to me is that you don't need to fully appreciate all of the water quality benefits of LID to be in favor of it.

5. The 9 finalist projects that I saw did not include any green roofs, and I don't know if any of the other projects included green roofs. What I saw primarily was a lot of bio-infiltration/rain gardens and some pervious pavement (at least one project was very heavily reliant on the latter).

6. Both of the urban re-development projects that made it to the final competition were very creative and showed how to integrate LID into the broader redevelopment framework (large sidewalks and a plaza designed to promote public use of the space also served as useful areas for infiltration).

7. One jury panelist, a landscape architect whose work focuses on office parks, told me that her clients are very interested in "green development" because they want to attract young talent, and that's what those prospective employees want.

Next Steps:

1. It will take a few months, but 2 gigabytes worth of presentations, data, graphs, etc., will be made available on their web site cited above. Please note the information that we will have access to will provide:

a. A large number of cost comparisons between LID and conventional stormwater solutions applied in 3 different types of real-life settings.

b. Lots of creative LID designs that show how to integrate LID into smart growth designs and into highway designs, both of which are greatly needed, as well as new residential developments.

c. References to Houston-based firms who now have some experience designing such projects.

2. Some information may become available sooner. I'll keep you posted.

3. This process can be replicated anywhere: New York City, Los Angeles, Boston, Miami, you name it. It's a simple yet amazing idea. We keep talking about how to get the word out on the effectiveness of LID as well as the costs savings and benefits that it provides. Here's a way to encourage the industry to convince itself rather than have us do it! I hope that we all can think of ways to use this example to think of and implement processes that can be used effectively to promote LID.

PRESS RELEASE



COMPETITION FINALISTS ANNOUNCED

FAST-PACED FINALS EVENT TO UTILIZE INNOVATIVE 'LIGHTNING' FORMAT

HOUSTON - January 13, 2010 Nine finalist teams competing in one of three design challenge categories in the Houston Land/Water Sustainability Forum's Low Impact Development Design Competition have been chosen and will make their presentations to a finals jury panel on Wednesday evening, January 27 at the Rice Hotel's Crystal Ballroom, in downtown Houston.

The finals event will feature a fast-paced 'lightning' presentation format, requiring presenters to use no more than 20 automatically advanced PowerPoint slides and to complete their presentation in 7 minutes or less. Attendees and Jury panel alike can expect each presentation to be lively, entertaining and thought-provoking.

The competition was designed to underscore the economic, environmental and quality of life gains to be had by adapting Low Impact Development and other sustainable development practices to local conditions. The HLWSF expects this competition to accelerate the speed with which these practices are adopted and implemented in the Houston area and it is expected that the finals presentations will demonstrate why, in dramatic fashion.

[Click here for list of finalists, ticketing information and event details.](#)

The finals Jury Panel, whose names will be released soon, is made up of important leaders in the development, construction, political and civic communities in the Houston area.

DESIGN CHALLENGE CATEGORIES AND SPONSORS

The finals Jury Panel will select \$15,000 prize winners in three categories:

SUBURBAN RESIDENTIAL

Prize money sponsored by Mischer Investments, LP

URBAN REDEVELOPMENT

Prize money sponsored by Architecture Center Houston Foundation (ArCH)

GREEN ROADWAY

Prize money sponsored by American Society of Civil Engineers, Houston Chapter (ASCE-Houston)

The finals event is underwritten by the Bayou Preservation Association (BPA) and civic leader and Board Member Terry Hershey. Challenge property donors include Harris County Precinct 2, City of Houston TIRZ 15 and Mischer Investments, LP.

STAGE ONE EXPERT JUDGES

Finalists were selected by the panel of expert judges listed below. Their backgrounds, experience and expertise were invaluable in making the selections. The task of judges in stage one was exceedingly difficult given the overall high quality of the entry submittals.

CIVIL ENGINEERING

Arthur L. Storey, PE

Executive Director, Harris County Public Infrastructure Division

LANDSCAPE ARCHITECTURE

Dana Nunez Brown, ASLA

Principal, Brown + Danos Landdesign Inc., Baton Rouge, LA

LOW IMPACT DEVELOPMENT

Larry Coffman

President, Stormwater Services Group, Chesapeake Beach, MD

ARCHITECTURE

Greg Papay, FAIA

Principal, Lake|Flato Architects, San Antonio, TX

HYDROLOGY

Stephen Costello, PE

Principal, Costello Inc. and City Councilman, Houston, TX

RESIDENTIAL DEVELOPMENT

Ted Nelson

Regional President, Newland Communities, Houston, TX

“The design competition has far exceeded our expectations in terms of interest and participation,” says Robert Adair, Houston Land & Water Sustainability Forum steering committee chairman and President at Construction EcoServices. “We had 22 integrated design teams involving more than 225 individuals submit design challenge solutions. They represent the ‘best and brightest’ from 48 of the top design firms in our area and include civil engineers, hydrologists, architects, landscape architects, land planners and environmentalists, among others. The quality of the submittals was outstanding.”

“The rapid-fire presentation format we’ve chosen for the Finals event levels the playing field and forces the presenters to make concise, understandable and exciting presentations that will appeal to the judges and the audience. It is actually quite a challenge to communicate and explain the attributes of a LID design project in seven minutes,” says Adair.

The finals event is expected to draw more than 250 attendees from the local design, planning, development and construction communities. The general public is also invited.

PRESS RELEASE-UPDATE



FINALS JURY PANEL ANNOUNCED

TOP DEVELOPERS, CIVIC AND GOVERNMENT LEADERS TO CHOOSE \$15,000 PRIZE WINNERS

HOUSTON - January 21, 2010 Finals presentations in the Houston Land/Water Sustainability Forum's Low Impact Development Design Competition will be judged by a Jury made up of some of the area's top developers, along with civic and governmental leaders interested in the direction of Houston area development. The competition was designed to explore the economic, environmental and quality of life gains to be had by adapting Low Impact Development and other sustainable development practices to local conditions.

The Finals Jury Panel and the organizations they represent include:

Commissioner Sylvia R. Garcia
Harris County Precinct 2 Commissioner

David Nussbaum, Vice President-Development
Mischer Investments, LP

Mike Talbott, Director
Harris County Flood Control District

Perry Senn, Principal
Peron Development

David Hightower, Ex VP & Chief Development Officer
The Wolff Companies

Amer Al-Nahhas, President-Civil
SpawGlass Construction Corporation

Frank Liu, Principal
Lovett Homes

Jimmy Pappas, Principal
Corinthian Development

Richard Johnson, Director of Sustainability
Rice University

Dov Weitman, Chief, Nonpoint Source Control Branch
United States Environmental Protection Agency

Terry Hershey
Bayou Preservation Association

John Blount, Director of Architecture & Engineering
Harris County Public Infrastructure Department

Ed Wulfe, President
Wulfe & Company

Carol Haddock, Sr Asst Director PW&E, City of Houston
American Society of Civil Engineers – Houston

Bill Huntsinger, VP-Planning
Metro National Corporation

Ian Powell, President-Elect, AIA Houston
Architecture Center Houston Foundation

Ralph DeLeon, TIRZ 15 Program Manager
City of Houston TIRZ 15

Christopher Gilbert, Project/Construction Manager
General Growth Properties, Inc.

Dan Gilbane, Development Manager
Gilbane Building Company

Andrew Steffen, Project Manager
Hines Interests

Nine finalist teams competing in three design challenge categories in the Houston Land/Water Sustainability Forum's Low Impact Development Design Competition will make their presentations to the finals jury panel in a public event at the **Rice Hotel's Crystal Ballroom, in downtown Houston on Wednesday evening, January 27.**

The finals event will feature a fast-paced 'lightning' presentation format, requiring presenters to use no more than 20 automatically advancing PowerPoint slides and to complete their presentation in 7 minutes or less. Attendees and Jury panel alike can expect each presentation to be lively, entertaining and thought-provoking.

[Click here for list of finalists, ticketing information and event details.](#)

The HLWSF expects this competition to accelerate the speed with which these sustainable development practices are adopted and implemented in the Houston area and it is expected that the finals presentations will demonstrate why, in dramatic fashion.

DESIGN CHALLENGE CATEGORIES AND SPONSORS

The finals Jury Panel will select \$15,000 prize winners in three categories:

SUBURBAN RESIDENTIAL

Prize money provided by Mischer Investments, LP

URBAN REDEVELOPMENT

Prize money provided by Architecture Center Houston Foundation (ArCH)

GREEN ROADWAY

Prize money provided by American Society of Civil Engineers, Houston Chapter (ASCE-Houston)

The finals event is underwritten by the Bayou Preservation Association (BPA) and civic leader and Board Member Terry Hershey. Mission-critical support for the competition has been provided by the American Institute of Architects-Houston. Design Challenge properties were provided by Harris County Precinct 2, City of Houston TIRZ 15 and Mischer Investments, LP.

Robert Adair, Houston Land & Water Sustainability Forum steering committee chairman and President at Construction EcoServices reports, "Twenty-two integrated design teams involving more than 225 individuals representing the 'best and brightest' from 48 of the top design firms in our area submitted design challenge solutions. Teams include civil engineers, hydrologists, architects, landscape architects, land planners and environmentalists, among others. The quality of the submittals was outstanding."

"The rapid-fire presentation format we've chosen for the Finals event levels the playing field and forces the presenters to make concise, understandable and exciting presentations that will appeal to the judges and the audience. It is actually quite a challenge to communicate and explain the attributes of a LID design project in seven minutes," says Adair.

The finals event is expected to draw more than 250 attendees from the local design, planning, development and construction communities. The general public is also invited.

PRESS RELEASE



‘HOUSTON, WE HAVE WINNERS...’

LOCAL COMMUNITY LIKELY BIGGEST WINNER AS COMPETITION PROVES BENEFITS OF LID

HOUSTON – January 28, 2010 Finals presentations, conducted in rapid-fire ‘lightning’ format were judged last night by a Jury made up of some of the area’s top developers, along with civic and governmental leaders interested in the direction of Houston area development. The competition was designed to explore the economic, environmental and quality of life gains to be had by adapting Low Impact Development (LID) and other sustainable development practices to Houston area conditions.

Nine finalist teams competing in three design challenge categories in the Houston Land/Water Sustainability Forum’s Low Impact Development Design Competition made their presentations to the finals jury panel in a public event, attended by more than 300 people, at the Rice Hotel’s Crystal Ballroom on Wednesday evening. Prizes of \$15,000 were awarded to the winners in each category, but the real winners were the citizens of the Houston area.

The winners, finalists and all of the participants in the Competition proved very clearly through their design solutions that Low Impact Development (LID) practices can be adapted to Houston area conditions, and that doing so can bring a host of benefits, including improving water quality in our streams, bayous and bays; reducing rainfall runoff flows that contribute to flooding; creating and restoring natural habitat; enhancing the natural aesthetics of our surroundings and improving quality of life in a variety of other ways.

The fact that their presentations demonstrated that all of these benefits can be had at a lower cost to developers bodes well for their rapid adoption and implementation. The winners in each category are:

GREEN ROADWAY DESIGN CHALLENGE

AECOM

SID EDMONDS, JIM SIPES, RUSSELL BYNUM,
JENNIFER HUNDL, ROSS GORDON,
JUNE TSOU, ADAM GUERRA, YOUNG-AE CHUNG,
ANNA HANSEN, JOHN SEXTON, KURT SMITH

URBAN REDEVELOPMENT DESIGN CHALLENGE

WALTER P. MOORE

KEVIN SULLIVAN, GARETH YOUNG, ANIRUDDHA DUTTA

GENSLER

RIVES TAYLOR, DAVID WILLIAMS, KIM KELLY, LISA GRAIFF

CLARK CONDON ASSOCIATES

JOSH LAMARTINA, ETHAN PRIMM, MATT DAWSON,
JOHN SCHNURE, PAUL WEATHERS, ELIZABETH GILBERT,
RILEY ANDERSON

DAN POPE ASSOCIATES

DAN POPE

SUBURBAN RESIDENTIAL DESIGN CHALLENGE

EDMINSTER HINSHAW RUSS & ASSOCIATES

JUSTIN RING, CHRISTOPHER BROWNE, STACI DUNCAN

LEGEND HOME CORPORATION

DAVID CARLSON

DAVIDSON LANDSCAPE ARCHITECTURE

KOLBY DAVIDSON

Harris County, the City of Houston and local constituent groups which are key to driving the adoption and implementation of these practices, including the American Society of Civil Engineers, Bayou Preservation Association, the American Institute of Architects and local developers, represented by Mischer Investments, LP, were all involved in sponsoring the Competition.

The HLWSF expects this competition to accelerate the speed with which these sustainable development practices are adopted and implemented in the Houston area and the finals presentations demonstrated why, in dramatic fashion.

The \$15,000 prizes in each category were provided by:

SUBURBAN RESIDENTIAL

Prize money provided by Mischer Investments, LP

URBAN REDEVELOPMENT

Prize money provided by Architecture Center Houston Foundation (ArCH)

GREEN ROADWAY

Prize money provided by American Society of Civil Engineers, Houston Chapter (ASCE-Houston)

The finals event was underwritten by the Bayou Preservation Association (BPA) and civic leader and Board Member Terry Hershey. Mission-critical support for the competition was provided by the American Institute of Architects-Houston. Design Challenge properties were provided by Harris County Precinct 2, City of Houston TIRZ 15, and Mischer Investments, LP.