

# Hosting a **Low Impact Development** Design Competition

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# Hosting a Low Impact Development Design Competition

The Water Environment Federation  
October 2013

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## **About WEF**

Founded in 1928, the Water Environment Federation (WEF) is a not-for-profit technical and educational organization of 36,000 individual members and 75 affiliated Member Associations representing water quality professionals around the world. WEF members, Member Associations and staff proudly work to achieve our mission to provide bold leadership, champion innovation, connect water professionals, and leverage knowledge to support clean and safe water worldwide. To learn more, visit [www.wef.org](http://www.wef.org).

**Cover photo:** This image was taken by Mark Garvin for the Community Design Collaborative during a design charrette held before the Infill Philadelphia: Soak It Up! competition.

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Teams discuss their concepts during the Houston LID Design Competition finals event. Photograph by Eric Hester.



## About the LID Design Competition Workshop

Throughout sections the U.S., there is a lack of familiarity with low impact development (LID) and green infrastructure (GI) — otherwise known as “green stormwater infrastructure” — in the engineering and design community. This is especially true in areas where stormwater regulations have historically been fairly non-dynamic. LID/GI design competitions (referred to as “competitions” in this document) give engineers, developers, landscape architects, and others a chance to gain experience with LID/GI in a low-risk environment. Competitions can also break down perceived barriers to LID/GI, such as performance and cost, and give the development and permitting community a chance to evaluate the benefits of using LID/GI.

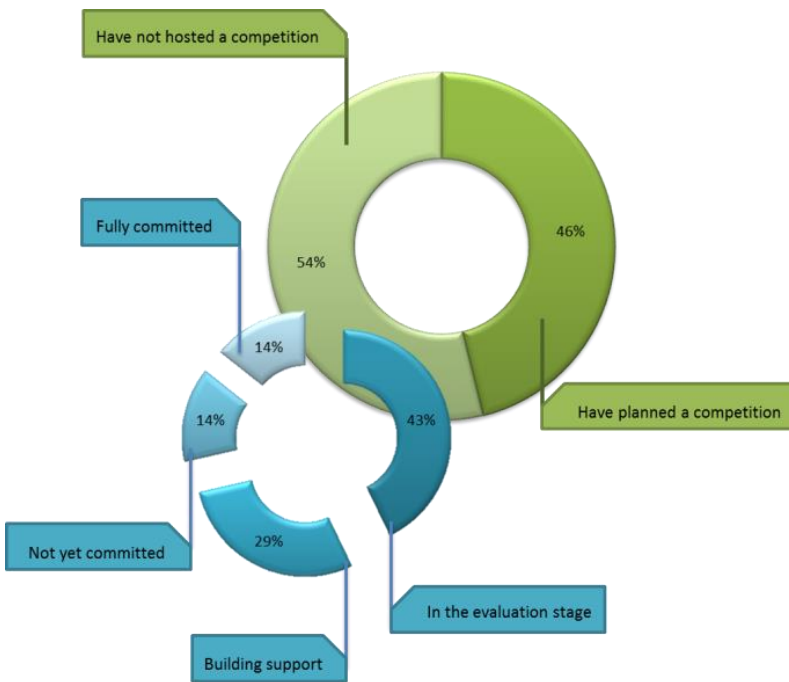
On May 16-17, 2013 WEF hosted a 2-day LID design competition workshop funded by a

Chesapeake Bay Trust grant. The workshop brought together representatives from both organizations with experience and those with an interest in holding such competitions. The goal was to address barriers and provide guidance for those who want to host an LID design competition in their region.

Of the 13 communities who participated in the workshop, six recently held (or attempted to hold) a competition. Of the seven communities that had not hosted a competition, three stated they were in the evaluation process, two stated their communities are generally supportive and the movement is gaining momentum, while one stated that their community has established positive support but has not committed to hosting a competition, and one community claimed to be fully committed to holding a design competition in the near

future. The information listed in the report and associated appendix is a snapshot of the status and background of these communities and their associated events.

Robert Adair, steering committee chair of the Houston Land/Water Sustainability Forum (HLWSF), provided insight from the 2010 Houston LID Design Competition, which has served as a model for many other competitions across the country and facilitated a discussion with other communities on this topic as an information sharing and dissemination effort. The following is an overview on various approaches to hosting an LID design competition based on input from the workshop.



**Figure 1.** A breakdown of workshop participants' experience with LID design competitions

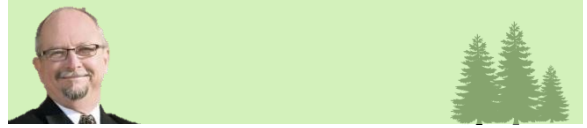
## Meet the facilitators



### Seth Brown

Seth Brown is the Stormwater Program and Policy Director at WEF. In leading WEF's stormwater program, Seth works with WEF members and other stormwater professionals to identify technical sector needs and develop programming and products to meet those needs. Seth has a B.S. and an M.S. in civil engineering, is a licensed professional engineer in the state of Maryland and is currently pursuing a PhD in civil engineering at George Mason University.

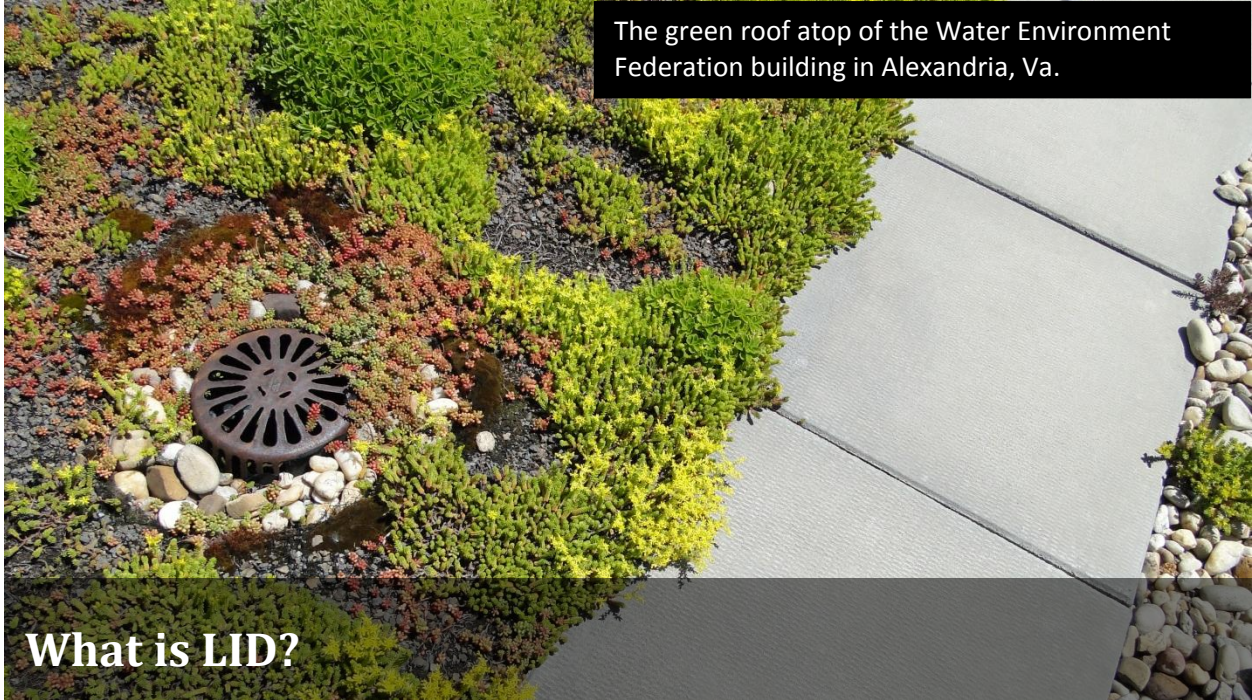
[sbrown@wef.org](mailto:sbrown@wef.org)



### Robert Adair

Robert Adair is president and co-founder of Construction EcoServices and Convergent Water Technologies. He also helped to form the Houston Land/Water Sustainability Forum (HLWSF) in 2007. The HLWSF is actively driving the adoption, adaptation and implementation of LID in the Houston area and has achieved national recognition from the EPA and others for its unique, market-driven approach to driving change. Adair is a passionate driver of new ideas, new technologies and a solutions-oriented approach to solving stormwater management challenges. He spent twenty years building cutting-edge technology companies, preparing him to see the stormwater industry and its myriad challenges in a non-traditional light.

[adair@convergentwater.com](mailto:adair@convergentwater.com)



*Low Impact Development (LID) is a stormwater management approach focusing on the use of decentralized infiltration- and retention-based practices that primarily rely on soil and vegetation to manage runoff. Practices such as rain gardens, permeable pavement, swales and cisterns are used in conjunction or in place of large downstream facilities such as stormwater ponds.*

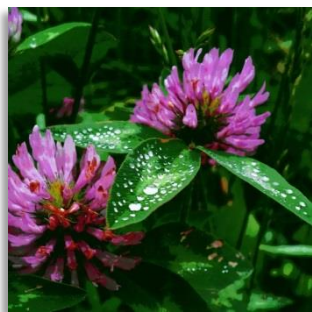
### ***The growing problem of urban stormwater***

Urban stormwater is a significant and growing problem across many regions of the U.S. For instance, it is the only growing source of water pollution in the Chesapeake Bay watershed. In many other watersheds across the country, it is the dominant cause of water quality impairment, particularly in urban areas. The high levels of impervious surface coverage associated with urban areas leads to increased runoff volume and discharges, which dramatically affect downstream conditions. An undeveloped or “pristine” site with average soil conditions and vegetative cover may capture and infiltrate 90 to 95 percent of precipitation that falls in a given year. If the same site were covered by an impervious surface, such



as a parking lot, the amount of runoff increases by a factor of five to ten or more. The long-term result is hydrologic redistribution of flows. Reduced groundwater deprives headwater streams of baseflow — the flow in perennial streams that occurs during dry periods — which reduces the quality of stream ecosystems. Increases in runoff rates and volumes delivered to receiving waters leads to aggressive channel erosion and significant effects on downstream properties and infrastructure. Also, drainage systems may become overwhelmed leading to increases in local flooding frequency and magnitude. Heated impervious surfaces will deliver runoff at an elevated temperature, which can stress sensitive aquatic biota. Lastly, the pollutants associated with various land uses throughout the watershed, from petroleum products to heavy metals to nutrients, are carried by stormwater directly to receiving waters.

### ***Solving urban stormwater issues with LID***



The LID/GI approach seeks to be, as EPA defines it, “hydrologically invisible.” These approaches reduce localized flooding while treating excessive runoff at

or near the source. Practices used in this approach include bioretention facilities (rain gardens), bioswales, green roofs, and rainwater harvesting cisterns among others. These practices can be used to cumulatively capture runoff and filter urban stormwater to minimize downstream impacts to water quality and man-made infrastructure.

Beyond the benefits associated with water, LID/GI provides many ancillary benefits. For instance, studies show that green roofs reduce rooftop temperatures by 40 to 60 degrees Fahrenheit (Gaffin et al., 2010), leading to reductions in HVAC energy demands. Similarly, the cumulative reduction in temperature associated with green practices addresses public health impacts and air quality degradation related to urban heat island effects. Higher temperatures place greater stress on economically disadvantaged populations with little-to-no access to air conditioning and can lead to higher incidence of heat-related physical impacts and even death. Urban forest canopy, including street trees and other deciduous covers used in GI practices, can have direct impacts as well. According to *Banking on Green* (Odefey et al., 2012), co-published by WEF, the American Society of Landscape Architects, and others, several cities have identified economic benefits from urban forests. Berkeley, California and Cheyenne, Wyoming showed an energy benefit of \$11 to \$15 per tree (McPherson et al., 2005), and trees helped Washington D.C. reduce energy consumption costs by \$2.65 million annually (Lyons, 2002).

In addition to producing more vibrant communities and reducing energy demands, LID/GI can also enhance nearby property values. Increases in property values can help to spur economic revitalization and enhance properties in socioeconomically depressed areas. Similarly, the jobs required to install, construct, inspect and maintain LID/GI installations often do not require advanced education, providing financial benefits to economically stressed populations. For instance, a new public-private partnership to provide over \$1 billion in stormwater management infrastructure in Prince George’s County, Maryland (a predominately

African-American community) has the potential to create more than 5,000 green jobs over the next 15 years (Spivack, 2013). Finally, LID/GI often costs the same or less than traditional stormwater infrastructure.

### ***Barriers to implementing LID***

Despite the benefits, there are barriers to the widespread implementation of LID/GI practices. These barriers include misaligned regulations, lack of professional experience and training, misconceptions on the cost-effectiveness of LID/GI, procurement processes that protect the status quo, a risk adverse land development community, outdated design standards, codes and ordinances, and a lack of long-term performance data for LID/GI practices. An overarching theme of these barriers is the local tie. In many areas, engineering and landscape architecture services are provided

by a handful of local firms that support land development in both the public and the private sectors. The goal of these firms is to provide services as needed by their clients, who — in both the public and private sectors — tend to be risk adverse in nature. Private developers tend to use methods and approaches that have worked in the past when developing projects in a jurisdiction, and local governments are not interested in placing taxpayer funds in perceived or real high-risk projects, regardless of benefits to the environment or society.



A design charrette hosted by the Community Design Collaborative gives participants experience with LID before the Infill Philadelphia: Soak It Up! competition. Photograph by Mark Garvin.





Attendees view an exhibit of green infrastructure designs before Infill Philadelphia: Soak It Up! Photograph credit: Mark Garvin

## What is an LID design competition?

LID design competitions (competitions) have emerged recently as a grass-roots effort to challenge designers and developers to overcome barriers to implementing LID and find ways to enhance the integration of LID into the landscape.

### LID design competitions serve several functions.

1. They can help demonstrate the concept of LID and educate designers, developers, municipal staff, elected officials and the general public about the advantages and benefits of LID.
2. Competitions can help to accelerate acceptance and implementation of LID practices into the development process.
3. LID design competitions can induce changes in policies, ordinances and guidance relating to land use planning, site development, and construction.
4. Competitions can promote the development or recognition of champions or experts who can lead, educate and model better design practices.
5. LID design competitions stimulate the formation of relationships and partnerships amongst diverse entities, such as engineers, planners, biologists, municipal, state and federal government officials, architects and landscape architects and public education staff.

The HLSF hosted the first competition of this nature in 2010 in Houston, Texas. This event challenged the land development as well as the engineering and landscape architecture communities to use LID practices on sites where traditional stormwater management

designs were already developed. One goal was to show that LID not only provides enhanced performance but can do so at an equal or lower cost. Over twenty teams comprised of engineers, landscape architects and architects submitted designs (HLSF, 2010). The Houston event was successful in engaging with local technical and development professionals. LID is now seen as an effective and affordable tool for addressing stormwater management challenges in the Houston area.

Innovative and original ideas are often replicated, especially effective ideas that can

**Competitions provide a vehicle for design innovation, engineering advancement, and professional debate.**



change the culture of a sector. The competition concept has been replicated in San Antonio, North Texas, Commonwealth of Virginia, and Philadelphia. They replicated the Houston example with positive changes in their areas as a result. Harnessing the power of competition to drive innovation in a sector is a hallmark of other sectors, including the hi-tech industry where Robert Adair began. He has been the prime mover in the Houston competition. Seeing the lack of innovation and originality in the stormwater sector, he borrowed aspects of the hi-tech field. The value of this approach is evident, which is why WEF's goal is to bring this innovative approach to a national scale.

Design competitions have been used in the past to encourage innovation and improve designs. A research study on the effectiveness of design competitions for bridges was conducted by the Massachusetts Institute of Technology in 2012. A conclusion from this study was that, "bridge design competitions provide a vehicle for design innovation, engineering advancement, and professional debate...Better bridges are born from innovation and creativity; design professionals must recognize the demand for both increased aesthetics and increased value with our built environment" (Goodman, 2012). The study goes on to conclude that, "we must take note of the vast array of benefits offered by bridge design competitions — the public demands better bridges, and our duty as design professionals is to deliver a product that effectively achieves that task." Many similar goals exist between the transportation and stormwater sectors — cost-efficient solutions, consistent and effective performance, wise investment of public dollars, enhanced aesthetics, and maximized benefits to the public. The District of Columbia's current green

infrastructure design competition includes “innovation in design” as the most heavily-weighted criterion in their scoring system. This weighting recognizes the fact that competition drives innovation in the sector.



### ***Why host an LID design competition?***

**An educational opportunity.** Throughout much of the U.S., there is a lack of familiarity and expertise related to LID in the engineering and design community, leading to status-quo-designs that call for traditional stormwater infrastructure, such as detention ponds. Competitions give design, construction and development professionals a chance to gain experience with LID in a low risk environment. Karen Bishop, representing San Antonio, stated that, “educational workshops on LID weren’t resulting in much implementation of LID, so one of the goals of the competition was to help get more LID projects on the ground.” A competition can help to provide the pragmatic learning opportunity needed to move from being interested in LID to getting projects in the ground.

**LID buy in.** In order to gain an appreciation for the benefits of LID, the engineering/design, land development and regulatory communities often need to see LID on the ground. A competition can provide the first step toward making LID projects a reality. Competitions can initiate a dialogue on the advantages of using LID, helping to address perceived barriers to LID implementation that are based upon a lack of experience or information. Examples of ill-informed, preconceived assumptions include a lack of effective performance, significant maintenance efforts, and high costs for design and implementation of LID practices.

### **Case Study: Washington D.C.**

DC Water launched its Green Infrastructure Challenge in the spring of 2013. The goal of the competition is to challenge firms to retrofit properties using innovative green infrastructure designs to reduce combined sewer overflows. Design teams are encouraged to illustrate practical and implementable solutions because construction funding will be available for the top finalists. Data from the projects will be used to demonstrate whether large-scale green infrastructure implementation could replace all or a portion of the Potomac and Rock Creek tunnel projects planned under DC Water’s consent decree.

[www.dewater.com/greenchallenge](http://www.dewater.com/greenchallenge)

Adair states that “firms need to work out the design and calculations on their own to really ‘get’ LID.” Competitions can facilitate these opportunities to learn and produce buy-in. One common theme demonstrated during competitions again and again is that LID can cost the same or less to install than traditional design. This cost-efficiency is gained through reductions in the size and amount of grey infrastructure, such as curb and gutter, drainage pipes, catch basins, and flood control basins. Participants also discovered that LID has a host of ancillary benefits from increased property values to enhanced mental wellbeing to water quality improvements. Competitions can go beyond getting buy-in to creating LID champions. Another dimension of buy-in includes backing

efforts by regulatory authorities or other governmental bodies that are committed to pursuing and encouraging LID.

Demonstrations of LID must show that the approach is both technically effective and worthwhile in the eyes of regulatory bodies.

**Generating ideas and development.** An LID competition is one way to generate innovative ideas from local and national companies. Competitions provide an opportunity to tap into new perspectives and add more tools to the toolbox. They can also help to facilitate the transition from conceptual interest in LID to on-the-ground applications through hands-on design work and high-quality presentations detailing the practical ways that LID can be implemented locally.

**Cross-collaboration.** LID competitions can foster new relationships in the development community that last long after the competition is finished. Many competitions require cross-disciplinary teams, which leads to more creative problem solving. For example, Houston required that teams include at least a civil engineer, a landscape architect, and an architect, who could be substituted for a transportation engineer on the city's roadway project. Cross-collaboration can introduce sector leaders to members of unfamiliar disciplines to form long-lasting partnerships. Requiring a multi-disciplined design team is a good way to encourage the formation of new alliances and partnerships in the design community as well as the public sector.

**Preparing for new regulations, standards, and ordinances.** An LID competition can help promote or prepare the development community for new regulations, requirements or design standards. The



### Case Study: North Texas

The North Central Texas Council of Governments encouraged cities to adopt the Integrated Stormwater Management Design Manual for Site Development. Dallas adopted the manual for non-mandatory use. However, its use among the development community was limited. In addition to the challenging economic condition, task force engineers, developers, landscape architects and others had no experience using LID. The cities of Dallas, Arlington and Fort Worth decided to host a regional competition in 2012 to increase exposure to LID. Due to the competition, a bond proposition passed that included specific language for green infrastructure in the right of way. The competition also provided more data and LID experience that North Texas can leverage to encourage the use of LID.

[texaslid.org/page.php?page=dallas](http://texaslid.org/page.php?page=dallas)

Virginia competition, for example, introduced participants to new state stormwater regulations. The Houston competition showed that LID could be used to achieve local enhanced detention requirements, even on clay soils with intense rainfall. The ongoing federal stormwater rulemaking will likely lead to the first national performance standard in the stormwater sector. Competitions could be a critical tool to help introduce and educate local designers and developers on changes to local design codes and ordinances associated with anticipated regulatory changes, such as a new state-level municipal separate storm sewer (MS4) permit.



## Four stages of the LID design competition

Competitions vary in their objectives, scale, and timing. They can be specific to a neighborhood, city, or region or be statewide, like the Virginia LID Design Competition. Some, like the Houston competition, are as quick as 10 months start to finish. Regardless of the time to host a competition, there are four essential stages common to these events to consider: pre-launch, launch, judging and the finals event, and post-competition efforts.

# 1

## *Prelaunch*

**Define the objectives.** Before the competition, it is important to determine how LID fits the region’s objectives and how a competition can further those goals. Communities, covering a variety of regions across the country, have vastly different geology, climate, land development patterns, and infrastructure needs. Some communities, such as Midwestern and East Coast cities, may see the widespread use of LID/GI as a way to reduce combined sewer overflows in addition to providing social benefits in urban

areas. Other communities with separate stormwater systems, such as Memphis and Chattanooga, may see the use of LID/GI as a means to reduce key pollutant loads in downstream waters and to minimize the impacts of excessive runoff peak flows and volumes on headwater streams. Linking regional and local needs with outputs is a good way to define motivations in a community. Support for LID/GI alone will not address the needs in an area. Communities must define goals and the appropriate short-

and long-term actions needed to meet those objectives. Common competition motivations and outputs include changing ordinances, standards, or codes; raising awareness of pending regulatory changes; educating practitioners and decision makers on the benefits of LID/GI; and increasing experience among members of the development community.

**Form a steering committee.** Building a strong, interdisciplinary steering committee is important because members may be involved in promoting the event, providing contacts, securing prize money, and encouraging participation on design teams. Members should include people who are influential and knowledgeable about the local community, such as key developers, city and county staff, and local trade-association leaders. Steering committee members should be prepared to meet regularly leading up to the competition launch.

**Set up program management.** In Houston, a subcommittee of the steering group did the detailed planning and met at least once per week. Volunteer time and roles may differ for staff-driven competitions like the San Antonio LID Design Competition, which was led by a public agency, the San Antonio River Authority. The City of Philadelphia design completion — titled “Infill Philadelphia: Soak It Up!” — was unique in that the organizing entity, the Community Design Collaborative (CDC), was selected by the Philadelphia Water Department through a request for proposals. The intensity of interest by local non-government organizations (NGOs) and relevant local government departments often will dictate the structure of leadership for a competition. Similarly, the presence of a champion at the local level will help to

determine the most effective group or organization to lead a competition.

**Select project sites.** It is important to identify real-world design project sites that could be developed using LID. Select sites based on specific goals. For example, it may be appropriate to select sites that are representative of local conditions or common development types. If possible, focus on worst-case scenarios in a region. By focusing on challenging land development sites, the competition can show that LID is applicable even under unfavorable site conditions. For instance, a site chosen for the Houston competition was once a rice-paddy field dominated by very tight clay soils and extremely flat conditions — both characteristics are challenging in terms of hydraulics as well as stormwater management and treatment. Many of the competitions to date focused on three project sites public/right-of-way, suburban/new development, and infill-redevelopment properties. A mix of land use types is also desirable, such as residential, commercial and institutional, or transportation and linear construction sites. Before approaching a developer for a competition project site, research the development company to determine which aspects of the competition will align with their interests. One advantage is that many teams would put substantial creative effort into developing a winning LID design that is

“Be willing to be creative in the kinds of properties you accept for the competition, and be ready for rejection before you have success.”

- San Antonio

more marketable, environmentally friendly, and less costly to execute than traditional design. According to feedback from the workshop, identifying project sites was also one of the more challenging aspects of hosting an LID design competition.



### Case Study: Virginia

The James River Association, Friends of the Rappahannock, and Potomac Conservancy led the Virginia LID Design Competition. They held a call for sites with little success. “You need to go to property owners to present your needs,” said Adrienne Kotula, policy specialist with the James River Association. “This also helps to ensure that you are achieving your goals in the project sites you pick.” The Virginia competition was statewide and properties included a suburban mixed-use and an urban development property in Fredericksburg, a mid-sized ex-urban community located an hour south of the DC metro area. Another project site was a green roadway project in Arlington, which is a large and densely-populated inner DC suburb in the Northern Virginia area. According to Kotula, community buy-in is key but was lacking in the statewide competition. “We did not have the community buy-in necessary for this to be a meaningful experience,” she wrote.

Workshop attendees recommend that the steering committee select sites rather than releasing a call for sites. This will allow competition staff or volunteers to ensure that sites correspond with the competition goals. One issue with soliciting for sites is that conflicts of interest could arise if someone with community connections or ties to the

competition submits a property that is not selected.

Collect the necessary site data for the design teams. This should include all the information typically provided to designers in a for-profit design effort such as, topography, vegetative cover, soil data, property boundary survey, infrastructure constraints, and environmentally sensitive areas.

**Create competition rules.** Goals and objectives should reflect existing or anticipated local design criteria, so that the competition can lead to designs that could actually be constructed. Examples include ensuring that the project is implementable and including a life-cycle cost comparison between LID and traditional stormwater infrastructure. For example, in Houston peak flow reduction is a key issue, so applicants were required to create LID designs with hydrographs that matched or reduced the peak discharge associated with all ranges of design storms from 5- to 100-year storm events. For the DC Water Green Infrastructure Challenge, there are specific criteria spelling out the need for “implementable solutions,” which is further supported by an actual implementation phase for teams selected in the design phase. Workshop participants advised using standardized criteria for project costs and estimated benefits, so that judges aren’t comparing gallons captured to greened acres. This also helps even the playing field.

**Offer Training.** Provide opportunities for the development community to learn more about LID before and during the competition. Host workshops offering continuing education credits or provide an online database of resources and online training.

**Secure funding.** Funding is needed to award competition winners as well as cover administrative costs for organizations who lead these efforts. Regarding prize money, high dollar cash prizes may draw attention to the competition and differentiate from typical design competitions. However, the ability to generate award money can be a challenge. Based on a survey of the LID workshop participants, 80% said that lack of funding is one of the most significant barriers in launching or holding a competition (see Figure 2). Those experienced with LID competitions suggest reaching out to local chapters representing the engineering, scientific, architecture, and landscape architecture professional community for possible funding. Grant funding through the Clean Water Act Section 319 program along with local and regional grant funding sources and foundations are other potential funding avenues.

**Expenses to consider in the development of a budget include:**

- marketing costs,
- expert-judging travel,
- prize money,
- finals event costs.

While registration fees and finals event tickets can provide sufficient income, funding may be needed ahead of time to underwrite the event. Beyond funding for the prizes, the Houston competition covered all other expenses.

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**NOTE**

Some outside of the workshop suggested a Request for Qualification would be a more consultant-friendly framework. A small number of qualified firms would receive money to develop designs submitted in a competition. This model is similar to the Kansas City Middle Blue River Basin Pilot Project, where four design firms selected based on their qualifications will be provided funds to develop innovative designs. An independent panel will review and judge their designs (Isch, 2013; Kansas City, 2013). This type of competition is inherently different than those described in this document. This framework may limit the exposure of the event and is not consistent with the spirit of open competition reflected by the competitions listed here. However, this could help to provide a more equitable vehicle for getting firms involved. Note that none of the individuals who participated in the workshop suggested this approach.

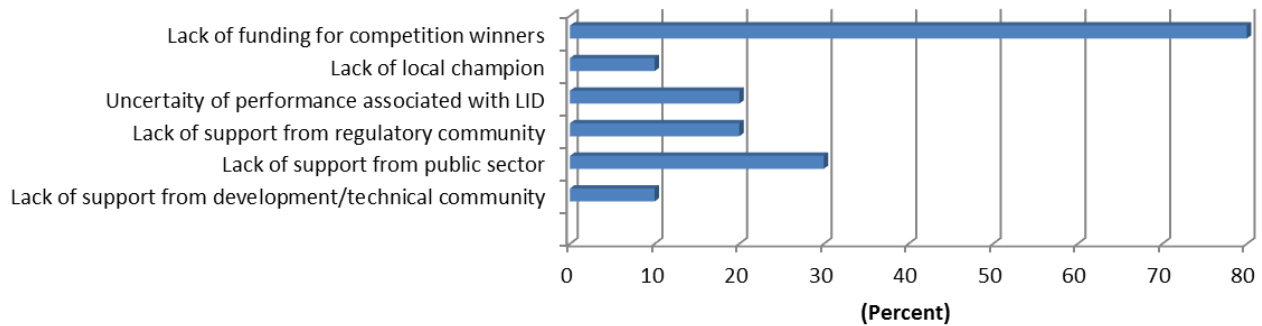
Open competitions can place an undue financial burden on firms in terms of labor costs. The argument against open competitions is that free design services are provided, and that even if a firm wins, the average award is much less than the cost for labor invested by the firm. Firms with a national scope may choose to engage in multiple competitions, which further compound these potential losses. Counter arguments against this skeptical view of open competitions is that firms are not required or forced to enter into competitions, so they choose to make these investments. It is not uncommon for firms to invest a great deal of labor into developing proposal for contracts that they may not win – competitions could be viewed as another marketing effort.



**Prize Awards.** The most common prize funding framework for competitions thus far is awarding cash prizes for each category, generally three to four, with each winner receiving \$15,000. The DC Water Green Infrastructure Challenge is unique in offering cash prizes totaling \$1.02 million, but it should be noted that a majority of these awards focused on the implementation phase of the competition. For government

entities, using private funds could present a conflict of interest, and they may not want to use public funds as a prize. In Philadelphia, the CDC was able to secure funding in place of the Philadelphia Water Department. Dallas worked with the North Central Texas Council of Governments and the Land/Water Forum to raise the money.

### What was or what do you expect will be the greatest barrier to holding a successful competition in your community?



**Figure 2.** Barriers to holding a competition



One of the winning teams from the Infill Philadelphia: Soak it Up! design competition. Photo credit: Mark Garvin

LID design competitions can help facilitate the transition from conceptual interest in LID to on-the-ground applications. Participating teams, winners, judges, and even finalist attendees can see the benefits of LID in practice. The competition has the power to not only change mindsets but turn participants into advocates.

# 2

## The launch

**Create a calendar.** In Houston, the competition, from launch to finals, took five months. The Houston experience focused on the positive aspect of the short time frame to quickly capture the attention of the local land development community and maintain momentum through the competition and beyond. The concern was that if the competition timeframe was drawn out, participating groups and teams may get distracted and lose focus on the topic and the event, leading to potential team drop outs.

Several important milestones on the competition calendar are the launch party, events or training leading up to the finals event, the submission deadline, the expert judging process, and the finals event. Workshop attendees recommended being prepared to extend the submission deadline by a week and to be available during that time to answer last minute questions.

**Market.** Develop a relationship with local media and help them to understand the basics of LID. Schedule a kick-off event with an influential speaker to make a splash and get media involvement. Throughout the competition, send press releases to local news outlets for major milestones and design team registration updates. Announcing competing teams serves the twofold purpose of marketing and peer-pressure to incentivize others to get involved. A blog, website, and e-newsletter are additional ways to reach out to the community. Utilize stakeholder mailing lists, and pass news along through national organization outlets, such as trade magazines and association websites.



### Case Study: Philadelphia, PA

Infill Philadelphia: Soak It Up! correlates with Philadelphia's Green City, Clean Water program. The program is an effort to transform one-third of impervious areas served by Philadelphia's combined sewer system and reduce CSOs by 80% using green infrastructure. The Philadelphia Water Department put out a request for proposals, and selected the Community Design Collaborative (the Collaborative) to run its LID design competition. The Collaborative hosted a series of events, including a design charrette and a precedent exhibition with projects from across the U.S. to inspire people before the competition.

<http://infill.cdesignc.org>

**Encourage participation.** More than 230 design professionals in 22 teams were involved in the Houston LID Design Competition, representing 42 firms and organizations. Most of these organizations were Houston-based. Pressure from peers and local government was significant in getting participants in the game. Government officials from the city and county levels should convey the internal significance of the design competition. Also, draw on the influence of the steering committee to increase participation.

Make participation easier by setting up a team/teammate finder. Houston and others used Google Groups for this. Also, maintain a level playing field by posting all participant questions and the answers online. This way no one team has access to more information than another.

# 3

## *Judging and the finals event*

**Expert panel.** In most competitions held to date, there has been a two-stage judging framework. The initial judging is done by a panel of professionals local to the competition with a strong knowledge of landscape architecture and engineering with a focus on stormwater management, land development, or environmental science. It should be noted that to be considered an expert for the technical panel, one does not need to have strong knowledge in or experience with LID/GI practices but be well-versed in basic technical elements of stormwater management. The second stage is a panel that judges presentations made during the finals event.

Expert judges's scores should carry the most weight. For instance, in the Houston experience, 80% of the total final scores for teams advancing to the final judging event came from the expert judging panel, while the finals jury accounted for 20%. This weighting ensures that the influence of highly qualified judges will dictate that winning teams have technically strong designs. In the judging process, judges received submissions one month in advance and were given a scoring sheet with key criteria and a point system. At the end of the month, the panel convened for an Expert Judges Meeting.

In Houston, the six expert judges represented an even mix of key local influencers with expertise in LID and traditional infrastructure. Serving as a judge can be a very subtle but strong positive influencer for those who either have doubts or know little about LID. In addition, having high-profile judges review the teams' work can attract participation on design teams.

The expert panel should have tie-breaking power. In Houston, expert judges ended up with several tied scores. The resolution was to reward projects that could be permitted with the least amount of variances. This responded to one of Houston's objectives, which was to get LID on the ground as quickly as possible.

**Finals panel.** In the Houston experience, the goal was to develop a finals panel made up of well-known local developers, politicians, and public agency leadership. The strategy for selecting this type of panel is that the jury members are then likely to promote the competition and the results and to advocate about LID after the event.

For example, Dov Weitman, who was a section chief with the U.S. Environmental Protection Agency's Nonpoint Source Control Branch, participated as a finalist judge in the Houston LID Design Competition. After the event, Weitman praised the event by stating:

"I was one of the finalist judges down there, and it ranks among the most exhilarating experiences of my 31-year career at EPA...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, EPA

Creating supporters who can further the message on LID locally and beyond should be a goal when considering finals event panelists.

Houston's 20 finals judges did not review the projects in advance but made decisions based on the team's pitches. Make sure to create a simple jury scorecard to easily tabulate the results during the finals event. Solid technical merit should come from the expert judges, but if the scores are close, the finals jury should be able to impact final winners.

**Collect the materials.** HLWSF made it clear that participants were not giving up rights to intellectual property but that the organization would have the right to use the materials submitted for promotion. The San Antonio Land/Water Sustainability Forum collected short descriptions and feature images for press releases along with longer pieces to use online and during judging. In addition, all competitions required teams to submit foam core boards for display at the finals event and for future exhibits.

To ensure the anonymity of design team members, it is important that the submitted

materials have no identifying marks. In Houston, a volunteer received and assigned each team a number as they registered. That number was used as the assigned team's identifier until the finals event.

Setup a cloud-based file sharing system, such as Dropbox, or an FTP site where users can submit large presentation files 24-hours in advance of the finals event. Competition volunteers or staff should ensure that presentations meet the required guidelines (time limit, slide count, etc.).

The HLWSF required presentation boards in addition to the following materials submitted in electronic format:

- Images and drawings,
- Site, drainage and landscape plans,
- Elevations and details,
- A written overview of their design concept,
- Hydrologic/hydraulic and water quality modeling used to develop design conclusions,
- Explanation of project costs and a cost comparison between LID and traditional infrastructure.

**Determine the logistics.** Make the finals event the "place to be," and consider locating this event in a high-visibility and upscale location. It is suggested that networking opportunities, such as an opening reception, be included to further the social experience. An agenda that is compact and has high-value entertainment elements, such as a well-known and well-established professional to emcee the event and fast-paced presentations, will add to the overall energy and momentum of the event. Use a videographer and photographer to capture future marketing materials.



Teams display their projects on foam core boards during the Houston LID Design Competition finals event. Photograph by Eric Hester.

Also keep in mind that the number of finalists and length of presentations will determine the overall length of the finals event. Philadelphia had nine finalist teams that each presented for seven minutes in an automated fashion. In addition, a short introduction to LID could benefit those who know little about the topic. However, the event should remain fast-paced in order to maintain the audience's attention.

Consider the number of volunteers or staff needed to make ticket sales ahead of time and onsite, setup display boards, help ready speakers, and set up presentations.

**Finalist presentations.** In the Houston competition, finalists were given three weeks to prepare for the finals event. On the night of the event, finalists gave 7-minute lightning presentations that resembled a pitch to developers. The goal was to challenge groups to “sell what they are bringing to the table” in terms of design. To ensure that presentations lasted only 7 minutes, Philadelphia finalists had to use automatic timing of 20 seconds per slide and could not touch the controls. The Houston event had a

similar automated presentation requirement. This “lightning round” style of presentations aids entertainment value and keeps the event moving forward, reducing the opportunity for unnecessary discussion of technical details that hamper the audience's interest.

Providing guidance on what finalists should include in their PowerPoint, the number of team members who can present, and the non-technical background of judges in the finals event will increase the quality and consistency of presentations.



Photographer Mark Garvin captures attendees watching teams present their proposed designs during the Infill Philadelphia: Soak It Up! finals event.

# 4

## *After the competition*

**Create a ripple effect.** Competitions can show that LID is cost-effective and confers a host of other benefits. Be sure to capitalize on both lessons learned and experts who participated in the competition. The finalists in the competition become LID leadership candidates because they now have a vested interest. Put the design team materials online and continue to showcase their work. Also continue to host events and training that promote LID, and share the competition

experience at conferences and through other outlets.

Gather feedback from design teams and judges, and track the spread of LID in the community. HLWSF hosted a one-year anniversary party for those who participated. The organization found that about 60% of participants had opportunities to work on LID during the last year, and about 70% of participant's clients were receptive to LID.

The competition has the power to not only change mindsets but turn participants into advocates. An example is that in Houston, engineering firms with a record of being generally unsupportive of LID now promote LID designs first, and hundreds of LID-based projects are under way in the Houston area.

**Break down barriers to LID.** Codes and regulations in a given marketplace might not support LID. Some municipalities have design criteria that require more traditional infrastructure to be provided as a back-up when LID is used, creating more costly designs leading to the incorrect assumption that LID is always a more costly option. An LID design competition can show that LID, by itself, is capable of achieving volume and rate reductions, enhanced detention, and water quality benefits in a variety of climates, soils, site conditions, and land development types. Competitions can also provide the argument locally that economics can be a driver for LID rather than a barrier. Once the typical barriers begin to recede, take advantage by supporting efforts to encourage the incorporation of LID practices into regulations and codes.

**Competitions can provide the argument locally that economics can be a driver for LID rather than a barrier.**



### Case Study: Houston, TX

After the Houston competition, HLWSF organized a series of collaborative workshops involving the design community, developers, and city and county staff that examined impediments to LID in Houston-area design and development codes. The end result was the *Harris County Low Impact Development and Green Infrastructure Design Criteria for Stormwater Management*. The document outlines simple, performance-based LID design criteria and a collaborative and expedited permitting process for LID-based projects. The goal, Adair said, is to get as much LID on the ground as possible during the next 3 to 5 years. Every stage of the process will provide opportunities for learning and collecting data to develop more formal code.

[www.houstonlwsforum.org/designCompetition](http://www.houstonlwsforum.org/designCompetition)

**Seize opportunities.** Regulatory drivers, such as consent decrees and MS4 permits, as well as capital improvement planning, such as roadway improvements or school expansions, can be viewed as opportunities to encourage the use of innovative stormwater approaches. LID design competitions give communities experience in LID and encourage a higher level of comfort using this approach to manage stormwater runoff. With greater experience, communities can begin to take advantage of the myriad of LID opportunities.

Commissioner Sylvia R. Garcia, part of the finals panel jury, stands to greet the audience at the Houston Low Impact Development Design Competition. Photograph credit: Eric Hester



## Conclusion

Innovative approaches are clearly needed to motivate changes that adequately address the significant challenge of managing urban stormwater runoff. Engaging with the public is among the toughest challenges facing stormwater managers. Further, professionals in the stormwater industry seeking to advance non-traditional, progressive solutions have the added challenge of overcoming assumptions and preconceived notions by those in both the public and private sector who seek to protect the status quo.

An effective approach that engages the public and challenges status quo thinking is LID design competitions. In a short amount of time, this approach has spread from Houston throughout Texas to many other parts of the U.S. The momentum of these competitions continues to build with cities from Sacramento to Pittsburgh considering design competition to further thinking on LID

and GI. In cities facing consent decrees, MS4 permits, and urban total maximum daily loads, this approach is proving effective in garnering support for LID and GI both in the technical community and with decision makers. Public officials often become champions for LID and GI once they fully understand the advantages and benefits this approach provides to the environment, their budgets, and the public.

There are many drivers for hosting an LID design competition but perhaps the best reason is because LID and GI practices lead to improved water quality and enhanced biological integrity in receiving waters. Our aim, as a sector, should be to encourage sustainable growth and development that respects our shared water resources. It is our responsibility to future generations that will depend on these valuable resources for their health, happiness and security.

## Appendix: References

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## Appendix: Online resources

### Water Environment Federation

#### **A Roadmap to Developing a LID Design Competition**

[bit.ly/1a6vxDy](http://bit.ly/1a6vxDy)

This three-part webcast provides an overview of the LID design competition. The key is changing the conversation from “will it work” to “show us it will” by moving the focus from water quality requirements to economic benefits. The information presented reflects experiences from the Houston LID Design competition, which took place in 2010.

#### **LID Design Competition Website**

[www.wef.org/LIDcompetition](http://www.wef.org/LIDcompetition)

A webpage created to house and share resources from WEF’s LID Design Competition workshop.

### Houston

#### **Houston Land/Water Sustainability Forum LID design competition Website**

<http://www.houstonlwsforum.org/>

This webpage provides information on various aspects of the Houston LID design competition.

#### **Houston Land/Water Sustainability Forum LID design competition white paper**

[bit.ly/GACnsj](http://bit.ly/GACnsj)

The white paper provides a summary of the Houston LID Design Competition experience, from planning to execution through the finals event and beyond. Houston’s white paper provides more extensive details on the HLWSF competition for those interested in following their model.

#### **Harris County LID and GI Design Criteria for Stormwater Management**

[bit.ly/1aShgLM](http://bit.ly/1aShgLM)

This document was created in part due to the response and rise in interest in LID and GI in the Houston and Harris County area.

#### **Re-Visioning Landscapes with LID: The Houston Experience**

[bit.ly/1aShgLM](http://bit.ly/1aShgLM)

An EPA Watershed Academy webcast featuring participants from all portions of the Houston competition—competition organizers, winners, and design judges. This webcast features a discussion of the competition's ripple effect on Houston's design/build community as well as the building ordinances in Houston.

## North Texas

### Dallas/North Texas LID Design Competition

[bit.ly/1aSk77k](http://bit.ly/1aSk77k)

This webpage provides information related to the North Texas LID design competition, including videos of finalist presentations. Watch videos of the finalists' seven-minute lightning presentations. Videos of the presenters are shown next to their slides.

## Philadelphia

### Infill Philadelphia: Soak It Up! Website

<http://infill.cdesignc.org/>

This webpage provides information on various aspects of the Philadelphia GI design competition.

### Infill Philadelphia: Soak It Up! EPA Webcast

[bit.ly/18XfE44](http://bit.ly/18XfE44)

This webcast features three winners from the Infill Philadelphia: Soak it Up! Design Competition. In Philadelphia's competition, teams were asked to address the unique stormwater management challenges and opportunities at one of three sites (industrial, commercial, or neighborhood). Winners were selected from 28 teams consisting of 101 firms and 315 professionals from across the nation.

### Infill Philadelphia: Soak It Up! Finals Video

<http://vimeo.com/62213497>

This video presents an overview of the Infill Philadelphia: Soak It Up! Design Competition with a focus on the finals event, held at the Academy of Natural Sciences of Drexel University in Philadelphia where nine teams presented their entries to the public. Winners in each of three categories were awarded \$10,000 prizes.

### Infill Philadelphia: Soak It Up! Summary Publication

[bit.ly/19mYw9T](http://bit.ly/19mYw9T)

This 32-page supplement was produced to recap Infill Philadelphia: Soak It Up! programs, events and competition for a broad audience. It was created in conjunction with Grid, a regional sustainability magazine. It will also serve as a take-away for the Soak It Up! Recap Exhibition, October 7 – December 7, 2013 to coincide with Greenbuild 2013 in Philadelphia.

## San Antonio

### San Antonio LID Design Competition website

[bit.ly/1gaKxFp](http://bit.ly/1gaKxFp)

This website provides information related to the San Antonio LID design competition.

## Washington, D.C.

### DC Water Green Infrastructure Challenge website

[www.dcwater.com/greenchallenge](http://www.dcwater.com/greenchallenge)

This webpage provides information related to the DC Water green infrastructure design competition.



## Appendix: Design competition status

*Information Dated September, 2013*

### Competitions Held/Attempted:

Houston, TX  
Philadelphia, PA  
San Antonio, TX  
Dallas, TX  
State of Virginia  
Johnson County, KS

### Pending Competitions:

DC Water (Washington, DC Water)

### Potential Competitions:

Pittsburgh, PA  
Chicago, IL  
Chattanooga, TN  
Memphis, TN  
New Orleans, LA  
District of Columbia  
Chesapeake Bay Region

## Appendix: Meeting participants & pre-workshop survey results

<b>Adrienne Kotula</b>	Policy Specialist at James River Association – State of Virginia
<b>Beth Dutton</b>	Program Manager, 3 Rivers Wet Weather, Inc. – Pittsburgh
<b>Beth Miller</b>	Executive Director, Community Design Collaborative – Philadelphia
<b>Bob Adair</b>	President, Co-Founder at Convergent Water Technologies – Houston
<b>Christine Donhardt*</b>	Senior Planner, Memphis and Shelby County Office of Sustainability – Memphis-Shelby County
<b>Dana Brown</b>	President at Dana Brown & Associates, Inc., Secretary, Louisiana Urban Stormwater Coalition – New Orleans
<b>Don Green</b>	Water Quality Supervisor, City of Chattanooga – Chattanooga
<b>Hal Sprague</b>	Water Policy Manager, Center for Neighborhood Technology – Chicago
<b>Jacob Baukman</b>	RiverWise Program Coordinator, Alliance for the Chesapeake Bay – Chesapeake Bay Region
<b>James Stitt</b>	Sustainability Coordinator, Pittsburgh Water & Sewer Authority – Pittsburgh
<b>Jamie Shairrick</b>	Public Education and Outreach Coordinator, Allegheny County Conservation District – Pittsburgh
<b>Karen Bishop</b>	Leader, Sustainable Watersheds Implementation Program, San Antonio River Authority – San Antonio
<b>Lee Kellenberger*</b>	Stormwater Program Manager, Johnson County Department of Public Works and Infrastructure – Johnson County, KS
<b>Mohsin Siddique</b>	Supervisor, Environmental Planning at DC Water, District of Columbia
<b>Nick Russo</b>	Environmental Team Leader, Harris County Public Infrastructure Department – Houston
<b>Susan Alvarez*</b>	Senior Program Manager, Stormwater at City of Dallas, Trinity Watershed Management Department – Dallas
<b>Tiffany Ledesma Groll</b>	Outreach Specialist and Program Coordinator, Philadelphia Water Department – Philadelphia
<b>Kristina Twigg</b>	Assistant Manager, Water Environment Federation
<b>Robert Goo</b>	Environmental Protection Specialist, Office of Wetlands and Watersheds, U.S. EPA, Headquarters
<b>Rebecca Hammer</b>	Project Attorney, Water Program, Natural Resources Defense Council
<b>Kevin O’Hara</b>	Manager, Government Affairs, American Society of Landscape Architects
<b>Seth Brown</b>	Stormwater Program and Policy Director, Water Environment Federation



\*Participated remotely via web conference



**Community:** Cities of Dallas, Arlington, Fort Worth and North Central Texas Council of Governments

**Affiliated organizations in event:** North Central Texas Land & Water Sustainability Forum

**Contact person/info:** Dorcy Clark, Chief Planner, Trinity Watershed Management  
214-671-9583 | 1500 Marilla | Room 6 BS | Dallas, Texas 75201

**Competition award amount and associated information:** Four categories at \$15,000 each (green roadway, mixed used development, urban infill, redevelopment)

**Competition award evaluation/criteria:** Provided under separate cover

**Describe your goals/objectives for a competition:**

1. Enhanced understanding and acceptance of LID techniques by development and professional design community.
2. Cost differential between traditional design and LID.
3. Information on barriers to implementing LID within current codes/regulations.

**Were public projects included in the event, and if so, please describe.** Yes - green roadway project, Arlington Library (urban infill)

**Were private projects included in the event, and if so, please describe.** Yes - Cedars West, a mixed-use development, and Northern Crossing, a redevelopment project

**Were institutional/commercial projects included in the event, and if so, please describe.** Yes - Please see above (mixed use/redevelopment).

**Have award projects been constructed?** No – The contest took place only 6 months ago. South Lamar has bond funds and is under design.

**If yes to above, how do design/actual costs compare?** All finalists showed LID estimated costs to be less than traditional design. No actual bids to allow comparison to date.

**If yes to above, has pre/post construction monitoring been performed, and if so, how does design/actual performance compare?** Pre-construction monitoring is performed as part of the city's ongoing water quality monitoring program.

**If projects have not been constructed, please explain.** See above.

**Describe lessons learned from event.** It is important to leverage lessons learned from city departments and the design community in a timely manner following the event, so the momentum is not lost.



**Community:** Philadelphia, PA

**Affiliated organizations in event:** Philadelphia Water Department, U.S. Environmental Protection Agency (Region 3), and Community Design Collaborative

**Contact person/info:** Beth Miller, Community Design Collaborative (beth@cdesignc.org); Joann Dahme, Philadelphia Water Department (Joanne.Dahme@phila.gov)

**Competition award amount and associated info:** Cash prizes in the amount of \$10,000 were presented to three winners, one in each of the three design challenge categories.

**Competition award evaluation/criteria:** see website: [http://infill.cdesignc.org/participate-2/design-competition/competition-packet/#design\\_goals](http://infill.cdesignc.org/participate-2/design-competition/competition-packet/#design_goals)

**Describe your goals/objectives for a competition:**

1. Encourage greater use of sustainable site design, green stormwater infrastructure, and low impact development.
2. Provide design, construction and development professionals in the Philadelphia region with meaningful, hands-on experiences working with green stormwater infrastructure methodologies that can be applied to their everyday practices.
3. Demonstrate the benefits (economic, environmental, social) of green stormwater infrastructure to local public officials (policy makers), developers, property owners, design professionals and community leaders.
4. Accelerate the process and implementation for three real-life sites which may act as prototypes for similar sites throughout the city.
5. Produce design solutions that motivate private property owners to invest in clean water technologies that manage stormwater.
6. Recognize innovation and creativity in creating high impact designs using green stormwater infrastructure and low impact development.

**Were public projects included in the event, and if so, please describe.** Neighborhood site had public, private and nonprofit components.

**Were private projects included in the event, and if so, please describe.** Industrial and commercial site

**Were institutional/commercial projects included in the event, and if so, please describe.** Commercial site

**Have award projects been constructed?** Not yet



## Virginia LID Design Competition

**Community:** Commonwealth of Virginia

**Affiliated organizations in event:** James River Association, Friends of the Rappahannock, Potomac Conservancy

**Contact person/info:** Adrienne Kotula, James River Association | 804-788-8811 | akotula@jrava.org

**Competition award amount and associated info:** Three \$15,000 awards

**Competition award evaluation/criteria:** How well does the submittal comply with the Competition Objectives? Does the proposal utilize LID methods as the predominant storm water infrastructure system?

**Describe your goals/objectives for a competition:**

1. Provide a hands-on learning experience through which design, construction and development professionals in Virginia will gain meaningful experience working with LID methodologies that can be applied to their everyday practices.
2. Demonstrate to statewide design professionals and to development and civic communities, the economic, environmental and marketing benefits available to those developers and local governmental entities who adopt and innovate with respect to sustainable site development.
3. Encourage through the body of work represented by the entries submitted greater use of these beneficial techniques for sustainable development in Virginia.
4. Recognize the participants and finalist design teams for their creativity, innovation and application of sustainable site design.

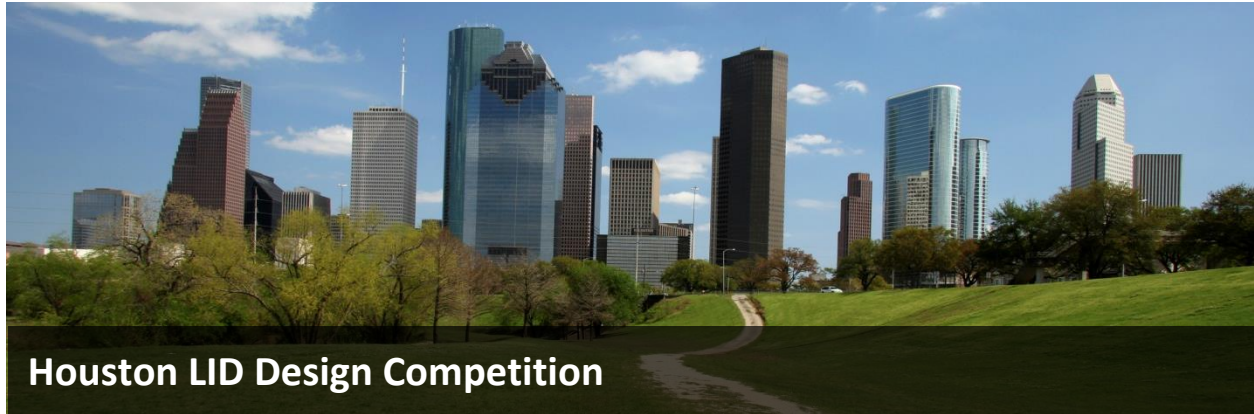
**Were public projects included in the event, and if so, please describe.** Yes, a public street in Arlington, Virginia

**Were private projects included in the event, and if so, please describe.** Yes, two private development sites, one suburban mixed-use and one urban redevelopment.

**Were institutional/commercial projects included in the event, and if so, please describe.** One mixed use site was used.

**Have award projects been constructed?** No. In order to acquire design sites, we had to promise that the winning designs would not necessarily be constructed. Owners were not willing to allow this.

**Describe lessons learned from event.** Marketing and outreach are key, as well as community buy-in. With a statewide competition, we did not have the community buy-in that is necessary for this to be a meaningful experience.



## Houston LID Design Competition

**Community:** Harris County (Houston, TX)

**Affiliated organizations in event:** Harris County and Houston Land/Water Sustainability Forum

**Contact person/info:** Nick Russo, Environmental Team Leader, HCPID-Architecture & Engineering Division | 1001 Preston, 7th Floor Houston, Texas 77002 | (713) 755-2804 | Nick.Russo@hcpid.org

**Competition award amount and associated info:** \$15,000 for each of the three design categories.

**Competition award evaluation/criteria:** See competition white paper listed in the resources.

**Describe your goals/objectives for a competition:**

1. LID experience was lacking, and we wanted to get more experience for design professionals, as well as agency employees.

**Were public projects included in the event, and if so, please describe.** Yes, a county public roadway and an inner city redevelopment project

**Were private projects included in the event, and if so, please describe.** Yes, one private suburban residential development

**Were institutional/commercial projects included in the event, and if so, please describe.** Yes, the inner city residential.

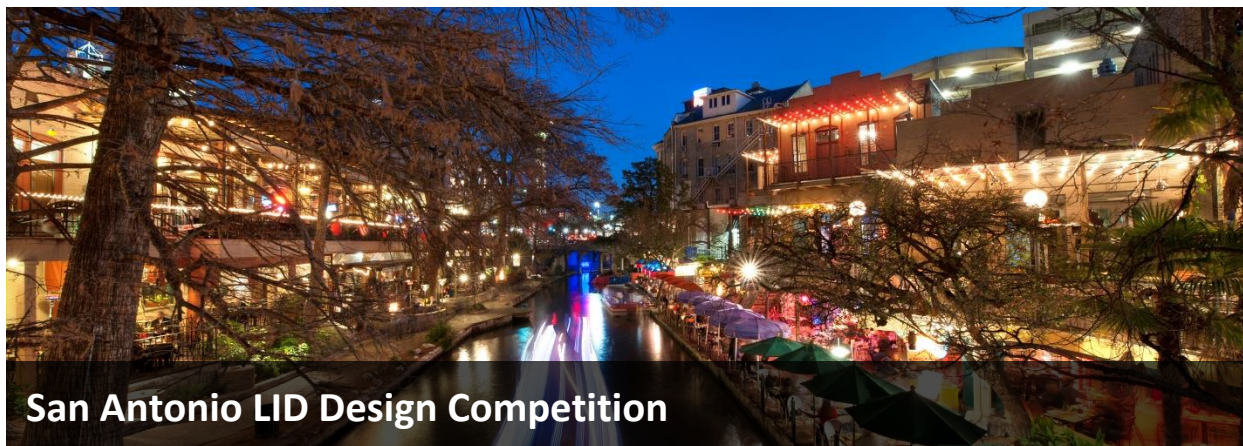
**Have award projects been constructed?** LID projects have been constructed as a result of the competition, but they are different projects from those featured in the design competition.

**If yes to above, how do design/actual costs compare?** LID design costs have been less expensive than the traditional design cost.

**If yes to above, has pre/post construction monitoring been performed, and if so, how does design/actual performance compare?** We are in the preliminary stages of monitoring our Birnamwood LID roadway project.

**Describe lessons learned from event.** HLWSF has developed a white paper on the website <http://www.houstonlwsforum.org/>. We also surveyed contestants one year after the finals event. Those results indicate that most of the contestants learned something, most of them realized future business opportunities using LID, and indicated that their clients were becoming more open to LID solutions.





**Community:** San Antonio/Bexar County, Texas

**Affiliated organizations in event:** San Antonio River Authority, San Antonio Land/Water Sustainability Forum

**Contact person/info:** Karen Bishop, San Antonio River Authority | (210) 302-3642 | kbishop@sara-tx.org

**Competition award amount and associated info:** \$15,000 in each of three categories

**Competition award evaluation/criteria:** Can be found at <http://bit.ly/15MMiGK>

**Were public projects included in the event, and if so, please describe.** City of Leon Valley (Bexar County, Texas) roadway and Hemisfair, which is a City of San Antonio project being run by an appointed government corporation board, the Hemisfair Park Area Redevelopment Corporation (HPARC).

**Were private projects included in the event, and if so, please describe.** Port San Antonio is a tax-exempt, self-sustaining enterprise that uses no public tax dollars, created by the City of San Antonio.

**Were institutional/commercial projects included in the event, and if so, please describe.** See above. Port SA may be included in this category instead of private.

**Have award projects been constructed?** Our finals event is July 10, 2013, so I cannot answer this question yet.

**Describe lessons learned from event.**

- 1) Provide some LID education to your design/development community before launching a competition.
- 2) Have both public and private entities on the committee putting on the competition. This broadens your reach, and gives you plenty of resources at hand should you run into problems of any sort.
- 3) Take time to educate your local media about LID in advance of any major competition milestones, so they have the basic understanding necessary to find clever ways to present your story to their audience.
- 4) Be willing to be creative in the kinds of properties you accept for the competition, and be ready for rejection before you have success.
- 5) Bring both LID supporters and detractors into your planning process. You will need both in your corner as the competition gets momentum and more people start to hear about it.
- 6) It takes a village to put on one of these things!



**Community:** Washington DC

**Affiliated organizations in event:** DC Water, the District Government, and EPA

**Contact person/info:** Kimberly Isom, DC Clean Rivers Project | [kimberly.isom@dcwater.com](mailto:kimberly.isom@dcwater.com) | 5000 Overlook Ave, SW, Washington, DC 20032 | (202) 787-4470

**Competition award amount and associated info:** \$1.02M

**Competition award evaluation/criteria:** see briefing document: <http://dcwater.com/greenchallenge>

**Describe your goals/objectives for a competition:**

1. Advancing innovative GI technologies in retrofit applications in the urban environment for CSO control with the goal of increasing runoff capture from impervious surfaces and reducing the associated costs of such retrofits.
2. Illustrating practicality by showing what is feasible and developing actual projects that will later be constructed in each area/design category.
3. Accelerating the implementation of innovative GI technologies that will support DC Water's GI implementation plan.

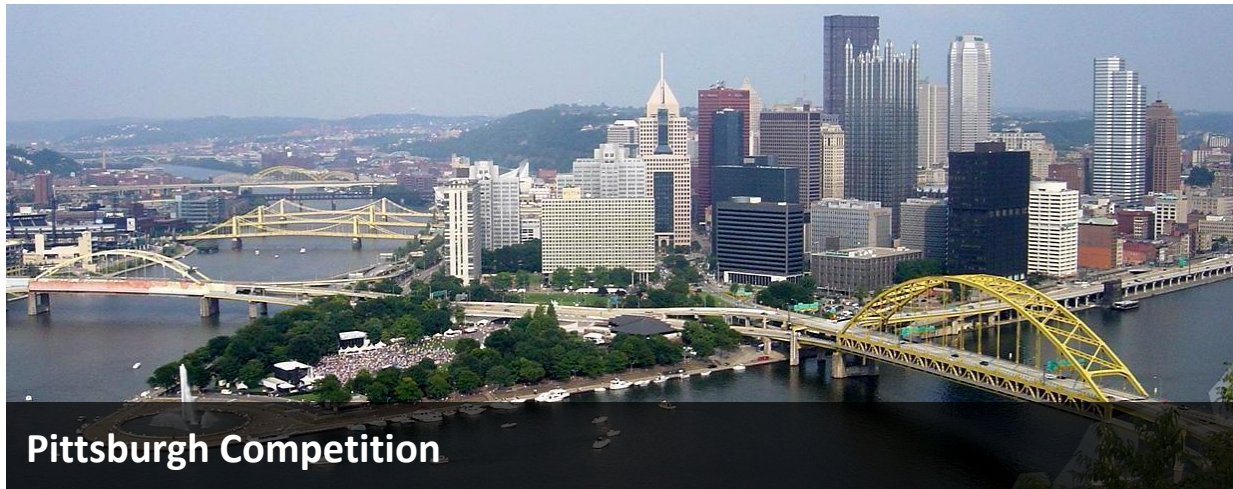
**Were public projects included in the event, and if so, please describe.** Yes, a public right-of-way. Two suggested sites were given, but the category is open to any projects within the watershed.

**Were private projects included in the event, and if so, please describe.** Yes

**Were institutional/commercial projects included in the event, and if so, please describe.** Yes

**Have award projects been constructed?** No, but the competition provides finalists in each category with construction funding. Projects are expected to be under construction in 2014.

**Describe lessons learned from event.** The competition was announced in April, and submissions are not due until October 1, 2013. Having an established method for issuing addenda and answering questions has been beneficial.



**Community:** Pittsburgh, Pennsylvania

**Affiliated organizations in event:** Pittsburgh Water and Sewer Authority, Allegheny County Conservation District, and 3 Rivers Wet Weather.

**Contact person/info:**

- James Stitt, Pittsburgh Water and Sewer Authority, (412) 255-8800 x8544, JStitt@pgh2o.com
- Jamie Shairrick, Allegheny County Conservation District, (412) 241-7645, jshairrick@accdpa.org
- Beth Dutton, 3 Rivers Wet Weather, (412) 578-8376, bdutton@3rww.org

**Competition award amount and associated info:** TBD – July 2015 is anticipated date of competition. Details are still being determined at this time.

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601 Wythe Street  
Alexandria, Virginia  
22314-1994  
703.684.2400  
[www.wef.org](http://www.wef.org)