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Harvesting the Value of Water: Stormwater, Green Infrastructure, and Real Estate.

How Stormwater Retention Paid Dividends for Three Sites

Recently, ULI hosted a webinar looking at how three different land uses were able to economically include stormwater diversion infrastructure in ways that added value. From a park in Washington, D.C., to a former department store warehouse in Portland, Oregon, to a Whole Foods site in suburban Raleigh, North Carolina, these diverse projects are linked by a common ingenuity in handling stormwater challenges.

These three examples were among many showcased in the Institute's recent report, [*Harvesting the Value of Water: Stormwater, Green Infrastructure, and Real Estate*](#), which highlighted the numerous ways in which water is not merely a threat requiring defensive measures, but "one that can be harnessed to make cities more sustainable and livable." These examples ranged from a suburb near Dallas to a flood-prone site in New Orleans to a pier development in Boston—locations prone both to excess water and to too little water—and featured an assortment of tools that can be combined given the circumstances. It is both an address of problems for cities and individual properties and sometimes even a means to make a profit. As the report notes:

"Cities across the United States are embracing green infrastructure approaches because they offer social, economic, and environmental benefits while addressing water challenges. Green infrastructure cost-effectively reduces sewer system overflows and manages stormwater runoff, improves local water quality, decreases the use of potable water, reduces heat-island effects, improves public health, enhances recreational opportunities, increases employment, and stimulates economic growth—all at a lower cost than gray infrastructure solutions alone."

The projects featured in ULI's webinar each involved differing approaches to water, designed to turn an unwelcome guest into a helpful one.

Brad Fennell, senior vice president at W.C. Smith, spoke about the public/private partnership of Canal Park in Southeast Washington, D.C., an infill park built in 2012 as an anchor both for the company's construction nearby and for the neighborhood in general.

Property developers and owners also indicated that design and operation of stormwater projects requires a learning curve, particularly in terms of landscape maintenance for green infrastructure installations such as bioswales and rain gardens. The three-block park replaced a former bus parking lot and public housing, and its foliage and leisure space are immediately apparent. The park is a space for area residents and employees to leave their cares behind, but the park is a warren of underground activity. As Fennell commented, "While lush landscaped areas provide a tranquil area to picnic and engage in a civic way below the surface, the park's hard at work capturing and cleaning stormwater. Most visitors to the park are unaware of the extensive stormwater recycling that's happening under their feet."

A complex system rests beneath the surface: one 40,000-gallon (151,000 liter) holding tank that

pumps water to bioplanters that irrigate the landscape. The water is then routed to a second cistern of the same size, where it is then cleansed through microfilters before use in the park's fountains and restrooms, and seasonally, in the park's 10,000-square-foot (929 sq m) ice rink. This water is tested weekly for quality. It is designed not merely with the idea of collecting water from the park itself, but also from nearby blocks that might not accommodate stormwater as effectively. It remains necessary to augment the site's uses with potable water for human consumption, but most needs can be filled by on-site collection.

One person asked whether this eliminated the need for water entirely; it cannot completely, due to inevitable seasonable variation:

"In a perfect world, we would have a big-enough storage facility to hold all the water necessary, but ultimately it rains during the colder seasons when you don't need the irrigation and it tends to be dry during the seasons when you're in drought, so having the ability to funnel more water into the system will help us in the long run."

The second project profiled was of a substantially different nature—not a permeable park, but a solid warehouse, a historically landmarked former department store warehouse in Portland. Working around the building's historic character, plenty of improvements were still possible. Sidewalk bioswales were located on every side of the full-block building, and accentuated by an 11,700-square-foot (1,100 sq m) green roof also featuring a solar array. All water from the rooftop is collected and reused for toilet flushing.

In renovating the building, Gerding Edlen, the property management company, realized that an entirely new foundation would be necessary. Thus, they decided to seize this opportunity to place a cistern beneath that surface, according to Renee Loveland, director of sustainability, Gerding Edlen, "by going deeper into the basement and creating the floor above." She estimated the necessary cost of reconstruction at about \$60,000 in any case; for an additional "\$80,000 in plumbing costs and pumps and motors and those sort of things," they yielded a 169,000-gallon bunker for water in the building's effective sub-basement.

It is an impressive figure that has yielded other impressive benefits. Loveland said that in 2016 "our harvested rainwater met 93 percent of all nonpotable needs in the building." Reclaimed rainwater provided 52 percent of all water use, potable or otherwise, for the building in that year. This system provided a dramatic reduction of 107 percent in the building's water bill. "We actually saved more money than we paid the city last year due to the water savings we achieved." And that is not the only benefit: the green roof has provided for reduced building heat gain and is an amenity to employees in its own right.

The next project shifted yet again, from city to suburb, to a six-acre (2.4 ha) project, the Market at Collonade, which contains a Whole Foods and a smaller additional building. Chris Widmayer, vice president of Regency Centers, outlined the site's constraints. "One is we did not have enough land to do traditional stormwater detention. The typical aboveground systems that we had looked at were too expensive." The site was additionally adjacent to a watershed and at active and frequent risk of stormwater runoff. They ended up with a site that is 80 percent impervious to water, and yet filled with other features to overcome this deficiency. As Widmayer commented, "A combination of cisterns to take the stormwater from the roof, subsurface infiltration systems, bioswales, and bioretention areas to clean the water, and landscape irrigation systems to use the water that has been reclaimed in a massive underground detention chamber." A cistern beneath the parking lot can contain 350,000 gallons (1.3 million liters) of water, used both for storage and to irrigate the landscaping. Another aboveground cistern next to Whole Foods collects all the water from the retailer's roof, then uses it for assorted purposes within the store. It is a system that can absorb a

remarkable amount of water. According to Widmayer, “with 36 inches of rainfall, only 0.6 inch [1.5 cm] float out of the system and into public storm systems.” In practical terms, “less stormwater runoff than the typical suburban house.”

A question emerged as to how these projects are being funded. These do involve varying amounts of resources from government bodies. The District of Columbia provided 65 percent of financing for the Canal Park project, and the North Carolina Clean Water Management Trust fund furnished around \$500,000 for the North Raleigh Project. There are encouraging signs that these are becoming less necessary. The Portland project received a \$25,000 grant from the city’s Green Investment Fund, but this grant no longer exists—not for lack of interest, but because such practices have become ubiquitous. Loveland said, “I would say that there are fewer financial incentives in this market currently for stormwater strategies because it’s become so much more commonplace.”

The Urban Land Institute

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