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The 2014 National Community Summit on Green Infrastructure: Summary Report

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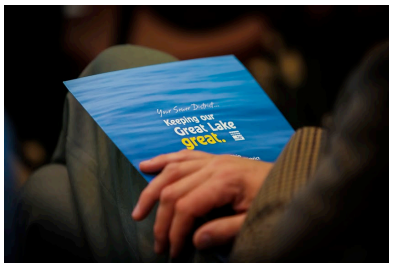

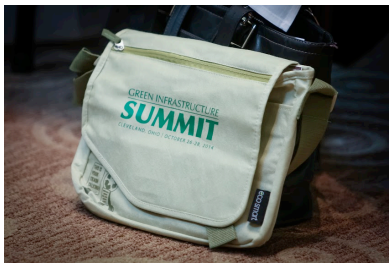

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Sponsorship and Location

The 2014 National Community Summit on Green Infrastructure (Summit) was held October 27-28, 2014 in Cleveland, Ohio. The Summit was co-sponsored by the U.S. Environmental Protection Agency (EPA), the Northeast Ohio Regional Sewer District (NEORSD) and the Great Lakes Environmental Finance Center at Cleveland State University (CSU). The CSU Maxine Goodman Levin College of Urban Affairs also facilitated and coordinated the event.

Goals of the Summit

- To convene communities advancing green infrastructure (GI) projects.
- To engage in dialogue surrounding implementation approaches, opportunities and obstacles.

The Summit is designed as a peer-to-peer dialogue, with community delegates learning from one another while also discussing implementation of green infrastructure directly with senior EPA officials. The primary purpose is to support local GI professionals and decision makers and build capacity for GI implementation by discussing and sharing best practices used to overcome challenges.

Participants

In total, there were 111 participants. They included Summit "delegates" invited from the ten 2011 EPA GI Partner Communities and thirty-nine EPA Technical-Assistance Recipients, as well as representatives from other local watershed planning and stormwater management agencies identified as making advancement in progressive stormwater management.

There were also observers in attendance, including 15 EPA representatives. The list of invited observers included faculty and researchers from CSU; federal, Ohio, and local officials; students; local nonprofit organizations; and additional interested individuals.

Structure

The event began with a welcome by Kenneth J. Kopocis, EPA's Deputy Assistant Administrator of the Office of Water, who also announced a new EPA resource, *Enhancing Sustainable Communities with Green Infrastructure*, a guide to help communities better manage stormwater while achieving other environmental, public health, social, and economic benefits.

The Summit was conducted in a series of four dialogue sessions. Each 80-minute dialogue session commenced with a 10-minute presentation by one or two of the community delegates introducing the dialogue topic. This was followed by delegate discussions focused on the benefits, challenges, and opportunities that GI presents to different types of communities.

The dialogue sessions were facilitated by Kevin O'Brien (Great Lakes Environmental Finance Center), Dr. Wendy Kellogg (CSU), Kathryn Hexter (CSU) and Kirby Date, AICP (CSU). Only Summit delegates engaged in verbal dialogue, but observers could write questions or comments on index cards, many of which were read aloud by the Summit facilitator for the Summit delegates to discuss or answer.

The Summit lasted a day and a half and was preceded by a half-day tour of GI projects in the Greater Cleveland area sponsored by NEORSD and CSU. Each stop was representative of the type of green infrastructure practices being implemented in Northeast Ohio and how they are being integrated into neighborhood developments. The tour stops showcased the following projects:

- West Creek Confluence Project - Restoration at the confluence of the Cuyahoga River, West Creek Conservancy
- Slavic Village Demonstration Project – Residential Bioretention & Rain Gardens, Northeast Ohio Regional Sewer District – Appendix 3 Green Infrastructure Project
- Vacant to Vibrant Project – Slavic Village, Cleveland Botanical Gardens,

And Slavic Village Development

- Cleveland Public Library, Jefferson Branch – Parking Lot Bioretention Northeast Ohio Regional Sewer District – Green Infrastructure Grant Project, Tremont West Development Corporation
- Azure & Outdoor Theater Parking Lot (Waterloo Neighborhood) – Bioretention Northeast Ohio Regional Sewer District – Green Infrastructure Grant Project, Northeast Shores Development Corporation
- University Circle Inc./Marriott Parking Lot – Commercial Pervious Pavement Northeast Ohio Regional Sewer District – Appendix 3 Green Infrastructure Project, University Circle Inc.

About This Report

This report presents key points from each dialogue session, as well as overall themes from the Summit as a whole. These key points and themes were synthesized by dialogue facilitators and representatives from CSU, NEORSD and EPA.

In addition, this report presents narrative versions of the lead presentations for each session. These are meant to serve as case studies of best practices to address each session topic.

Summit Dialog #1

Reducing Stormwater Volume to Control Sewer Overflows

Facilitated by: Kevin O'Brien, Great Lakes Environmental Finance Center, Cleveland State University

Presenter: Kellie Rotunno, Northeast Ohio Regional Sewer District

Green Infrastructure for CSO Control: Lessons Learned from NEORSD

Presented by Kellie Rotunno, Northeast Ohio Regional Sewer District

Created in 1972, the Northeast Ohio Regional Sewer District (NEORSD) is a political subdivision of the State of Ohio. NEORSD serves 1 million customers within a 355-square mile area encompassing the City of Cleveland and many of its suburbs. NEORSD treats more than 90 billion gallons of water a year at three wastewater treatment plants.

The City of Cleveland and several inner-ring suburbs contain combined sewer overflows (CSOs). As of 2014, some 4.5 billion gallons flow through those CSOs, a 50 percent reduction since the 1970s. NEORSD's consent decree with EPA calls for a reduction to 0.5 billion gallons by 2036.

In 2011, NEORSD submitted a Green Infrastructure Plan to the EPA that calls for a "gray plus green" approach to CSO control. Under the Plan, NEORSD will spend $42

million over eight years on GI measures that will result in an additional 44 million gallons of CSO control.

One project will introduce significant GI measures to the Urban Agriculture Innovation Zone in Cleveland, which provides land for small-scale farms. Currently, all of the 7 million gallons of annual stormwater at the site flow to CSOs. After NEORSD's $7.2 million investment, that amount will decrease to an estimated 1.2 million gallons.

In Cleveland's downtown, $3 million in GI measures on the city's rebuilt Public Square will lead to an estimated 3 million gallons of stormwater controlled annually.

These new GI measures will provide additional resiliency for NEORSD's gray infrastructure, freeing up capacity when major storm events occur. They also provide co-benefits for communities, including the creation of new green space on formerly vacant or underused property -- especially important in a city such as Cleveland, which has a declining population and more than 2,000 acres of vacant or distressed properties.

Key points of NEORSD's "gray plus green" approach are:

- CSO volume measurement requires clear understanding of GI-baseline conditions.
- The cost of additional CSO volume control substantially increases when aiming for a 98 percent capture rate, whether using GI or traditional infrastructure.
- Opportunities for increased CSO system performance are identified as long-term control plans are advanced.

- GI can play a significant role in resiliency planning by freeing infrastructure capacity.

NEORSD implemented a Regional Stormwater Management Program where customers will pay a fee based on impervious surface area. The program has faced opposition from some member communities and has been argued before the Supreme Court of Ohio. The program is currently enjoined pending a ruling from the court.

Facilitated Discussion #1:

Identifying how using GI to reduce sewer overflows impacts siting, design and measures of success.

1. The benefits of GI projects should be evaluated when considering their implementation.

- The EPA is asking for agencies to evaluate performance on both water quality and quantity to justify using GI to meet consent decrees.
- Monitoring is important to demonstrate the benefits of GI.
- In evaluating projects, agencies should differentiate between water quality and water quantity effects.

2. The public must be educated about the benefits of GI.

- The public often has their rates increased to help pay for CSO fixes, so it is important to inform them about the potential benefits of GI.
- Many members of the public do not understand the difference between gray and green infrastructure; agencies must convey these differences and the benefits of GI.
- Agencies should particularly aim to engage citizens in low-income neighborhoods, where there is often less awareness of stormwater issues.
- The public has the potential to view GI as helpful for community development.

- In planning projects, it is important to connect with nearby property owners and residents.
- Incentives include reduced sewer fees in exchange for GI and assistance with stormwater design.
- Maintenance agreements can be a tool for ensuring longevity of stormwater best management practices (BMPs) on properties receiving storm water credits.

3. Administrative concerns may affect -- but should not prevent -- using GI as a component of meeting consent decrees.

- The EPA has a good track record of allowing cities to modify plans to include more GI.
- The EPA prefers to adjust permits rather than master plans.
- Permits are inherently more flexible than master plans because they are only valid for five years, and are negotiated to meet specific goals for the time period.

4. GI projects should be designed to reflect their surroundings.

- Green conveyance measures, perhaps as a component of parks, may help reduce size of gray containment structures.
- The ecology and topography of a site -- e.g., determining soil types and presence of steep slopes -- are important design considerations.

5. Gray infrastructure will likely need to be part of CSO strategies for the foreseeable future.

- Districts currently cannot get to end goals of compliance through GI alone.
- Atlanta finished its consent decree in 2014, largely through gray infrastructure.

- Everyone wants GI, but it is expensive and difficult to come back and build a tunnel later if GI is not adequate.
- Gray infrastructure could possibly be phased out over time if projects are planned strategically.
- Monitoring and project evaluation should help clarify what is the maximum stormwater treatment volume that could be handled by GI, an amount that will likely vary by project.

Summit Dialog #2

Creating Effective Stormwater Management Opportunities

Facilitated by: Kirby Date, AICP, The Center for Community Planning and Development, Cleveland State University

Presenter: Neal Shapiro, The City of Santa Monica, California

Green Infrastructure & Urban Water Management: Sustainable Management Practices

Presented by Neal Shapiro, The City of Santa Monica

Santa Monica, California, is located on the Pacific Ocean in western Los Angeles County. It is surrounded on three sides by the City of Los Angeles. Santa Monica is a built-out city, highly urbanized and with high levels of impermeability. Although it has no CSOs, all stormwater runs off to the ocean untreated. The city receives 12 inches of rainfall, on average, mostly between December and March.

The Southern California Coastal Water Research Project, a leading marine research group in Southern California, has reported that urban runoff is the leading source of water pollution in the Los Angeles area. Stormwater pollution has increased between 200 and 700 percent during the last 20 years.

To address this, Santa Monica has set the following watershed objectives:

- Harvest urban runoff for use (infiltrate or direct use) and pollution treatment.
- Connect land use/design to the Hydrologic Cycle, reducing the disconnection and disruption of water flow.
- Mimic nature and blend into the land.
- Take a proactive, watershed approach to reducing urban runoff problems.
- Use GI and low impact development to retrofit urbanized areas.
- Convert a perceived “waste” into a valuable resource for use.

The city has enacted several ordinances to support these objectives. For example, the Urban Runoff Pollution Mitigation Code says that mitigation costs must be borne by property owners via post-construction structural BMPs. It also has a stormwater utility parcel fee and a special tax to fund projects, and operation and maintenance, leading to cleaner beaches.

In considering stormwater projects, city leaders prefer projects that lead to reduction in stormwater (e.g. stormwater harvesting and onsite use; indoor flushing and subsurface infiltration) over treat-and-release solutions (e.g. detention).

For example, the city has implemented a green alleys program using permeable pavement, as well as pervious gutters and intersection swales, both leading to on-site infiltration. In-line stormwater harvesting is also supplying a new source of fresh water.

Finally, parks throughout the city are being retrofit with green features that lead to on-site retention, and infiltration and direct use.

Santa Monica also partnered with Los Angeles on the Santa Monica Urban Runoff Recycling Facility (SMURRF). SMURRF recycles an average of 225,000 gallons of harvested non-stormwater (dry weather runoff) per day, accounting for about three percent of the city's daily water use. The facility offers tours to educate the public.

Facilitated Discussion #2:

Developing strategies for adopting GI that improve stormwater management, reduce pollutants and improve water quality including the impacts of local stormwater regulations, financing and operations and maintenance.

Key Points of Facilitated Discussion #2:

Operations and Maintenance

1. Tiered levels of service should be implemented in maintaining GI projects.

- Communities are now deep into building many GI projects. Rather than isolated demonstration projects, most have a wide portfolio of projects.
- It is impractical and costly to use a one-size-fits-all approach to maintaining all of them.
- Agencies should consider cost, but also make a conscious policy decision about what level of service is important to provide depending on the situation.
- Level of service (e.g. frequency of visits, type of services per visit) should depend on the BMP and its location, with some requiring more intensive maintenance than others. Factors include type of BMP, visibility, volume and capacity of BMP, proximity to other BMPs, likelihood of public interaction, opportunities for collaboration/support with other organizations/individuals (see below).

- Kansas City uses a tiered system, A through C, to determine level of service for each GI project.

2. Partners can assist with Operation and Maintenance (O&M).

- Partnerships can remove some O&M burden from municipalities and sewer districts.
- Potential partners include property owners, nonprofits, neighborhood groups and parks districts.
- Each partner should take on responsibilities for which it is best suited.

3. GI projects should be monitored and regularly checked to determine how they are conforming to standards.

- Regular monitoring is important for adjusting GI projects to be more effective.
- Some agencies use written manuals; others have less formal strategies.
- Communities need to define effectiveness standards themselves, because different agencies have different budgets, sizes and partners, and BMPs also differ.
- Monitoring plays an important role in evaluating the effectiveness of both BMPs and maintenance procedures.

<u>Financing and Funding</u>

1. A variety of mechanisms can fund GI projects.

- Stormwater fees and sanitary sewer fees are both valid strategies that have been used by delegates.

- Savings (e.g. from reductions in energy consumption) can help fund GI projects.

2. Operations and maintenance must be included in budgets at project outset.

- Construction-only budgets fail to safeguard initial investment.

Regulations v. Incentives

1. Communities should use both regulations and incentives to encourage GI.

- A combination of incentives and regulations is ideal.
- Incentives may encourage early adopters, but at some point GI must become a requirement.

2. How you implement a regulation is as important as whether you're regulating.

- Transparency and education about community benefits are important in earning support.
- Tying GI to economics -- "replacement is less expensive than system failure" -- can also help persuade people of the importance of regulations and even stormwater fees.

Summit Dialog #3

Maximizing Multiple Benefits

Facilitated by: Kathryn Hexter, The Center for Community Planning and Development, Cleveland State University

Presenter: Jay Squires, The City of Spartanburg, South Carolina

The Northside Initiative: Building a Neighborhood of Choice

Presented by Jay Squires, City of Spartanburg, South Carolina

Spartanburg's Northside neighborhood is a low-income community near the headwaters of the impaired Fairforest Creek. Northside boasts an impressive constellation of assets, including the Spartanburg Regional Hospital System, Wofford College, the Edward Via College of Osteopathic Medicine and a number of large apartment complexes. It is located only two blocks from downtown. Yet it has continued to struggle with ongoing problems of poverty and disinvestment.

To make the neighborhood safer and stronger, the nonprofit Northside Development Group (NDG) is using a variety of tools, including land acquisition, organizational partnerships, and raising money from local and national foundations and corporations alongside strong ongoing funding and staff support from the City of Spartanburg.

NDG's environmental vision for Northside included a strong green infrastructure component centered around Fairforest Creek. The organization aims to make the creek a focal point of the community while removing 1,800 of traditional sewer pipe. It also plans to add a 150-foot buffer of green space around the creek.

To support the neighborhood's environmental vision, NDG in 2013 won a $65,000 grant from EPA's Green Infrastructure Technical Assistance Program. The grant is paying for assistance to support the development of conceptual designs for green infrastructure practices throughout Northside, including:

- Incorporating water quality techniques into the master plan
- Planning a stream restoration project
- Provide storm water quality educational opportunities for the citizens of the City and, the region.

Cities must be the "guinea pigs," implementing progressive stormwater projects of their own volition before requiring them of private developers.

Facilitated Discussion #3:

Designing projects to provide socioeconomic, recreational and ecological benefits through infrastructure improvements and innovative and sustainable financing approaches.

Key Points of Facilitated Discussion #3:

1. Evaluate GI benefits differently from gray infrastructure benefits.

- While GI may not significantly impact CSO reduction, it is still "the right thing to do," both for "co-benefits" -- e.g. added green space, public education -- and because scalability may increase over time.
- GI creates community value that gray infrastructure doesn't.
- When it comes to GI, communities must consider "co-benefits" in addition to consent decree impacts.

2. Form partnerships to achieve multiple goals.

- Single agencies generally cannot identify or implement all the potential goals of a project.
- Partnerships, formed early in planning process, are the best way to maximize benefits.
- Agencies should communicate regularly with each other and with the public to ensure highest number of benefits.

3. Measure GI benefits in ways that go beyond direct impacts on CSO reduction and overall runoff reduction.

- GI benefits cannot be compared dollar-for-dollar with gray infrastructure benefits.
- GI has many benefits that gray does not: improving property values, creating jobs, even reducing crime because they reduce vacant lots.
- Need metrics to quantify GI's social, economic, ecological and recreational benefits.
- Data may be difficult to obtain.

Summit Dialog #4

Building Resilient Communities and Infrastructure

Facilitated by: Dr. Wendy Kellogg, The Maxine Goodman Levin College of Urban Affairs, Cleveland State University

Presenters: Evan Canfield, Pima County Reg. Flood Control District

Debbie Mans, New York-New Jersey Baykeeper

Building a Resilient Community: Tucson, Arizona

Presented by Evan Canfield, Pima County Regional Flood Control District

Pima County, home of Tucson, measures approximately 9,000 square miles in area. It has minimal non-surface water resources and is heavily dependent on the Colorado River for drinking water. This has created long-term concerns about the vulnerability of the county's drinking water supply.

The county's 2011-2015 Action Plan for Water Sustainability set the following goals:

- Manage demand
- Continue to supply water
- Respect the environment
- Use comprehensive integrated planning

The Action Plan also called for increased use of stormwater. It called for preparation for design guidelines for neighborhood stormwater harvesting. Stormwater could then offset potable water use for irrigation of desert vegetation.

A low-impact development (LID) working group was formed to collaborate on regional implementation of LID and Green Infrastructure. The working group developed 15 case studies to demonstrate successful implementation of GI/LID.

The working group also collaborated on a Low Impact Development and Green Infrastructure Guidance Manual - a collaboration between Pima County, the City of Tucson, EPA and Tetra Tech. This manual serves as the neighborhood scale water harvesting guidance called for in the 2011-2015 Action Plan.

An appendix to the Low Impact Development and Green Infrastructure Guidance Manual evaluated each of the eight GI construction practices described in the manual. It also looks at the costs and benefits of building projects with GI in comparison to traditional practices. The evaluation used the Envision Rating System developed by the Institute for Sustainable Infrastructure (ISI) to evaluate the costs as well as the direct and indirect benefits. The evaluation is implemented through the AutoCASE tool and the Business Case Evaluator (BCE) spreadsheet.

For one commercial site, the BCE calculated that the government, community and environment all benefit from the use of GI/LID features. Overall, the GI implementation of the commercial site created greater net value than the traditional approach. The government benefits from lower irrigation costs, higher economic activity

and lower health costs due to reduced air pollution. The community benefits from lower heat mortality rates and better air quality. The environment benefits from reduced pollution and carbon emissions.

The county and its partners have concluded that even though Tucson and Pima County do not have combined sewers, GI and LID practices are beneficial on a number of levels. Tucson and Pima County use regulatory and non-regulatory approaches to encourage the adoption of GI and LID practices. And although Pima County is a water-scarce region, the co-benefits provided by GI and LID practices appear to have an even greater financial benefit than the value of the water itself.

Building Resilient Communities and Infrastructure from the Ground Up

Presented by Debbie Mans, NY/NJ Baykeeper

NY/NJ Baykeeper (Baykeeper) is a nonprofit organization whose mission is to protect, preserve, and restore the ecological integrity and productivity of the Hudson-Raritan Estuary. The organization shapes and enforces water quality, land use, and coastal policies that impact the estuary and actively patrol the waterways to identify and stop polluters.

As one of its efforts to improve water quality in these watersheds, Baykeeper participated in a community-based climate resiliency plan in the City of Newark. The plan involved working with a group of nonprofits and Rutgers University to complete climate risk mapping and develop steps toward community and social resiliency.

Plan partners formed the Newark DIG (Doing Infrastructure Green) initiative to establish GI as the first line of defense to better manage stormwater runoff, improve water quality and resilience to flooding and reduce combined sewer overflows (CSOs). Newark DIG focuses on the Passaic River and its tributaries.

In one project, the City of Newark's Office of Sustainability, Engineering Office, Water & Sewer, Traffic & Signals have been working with the Rutgers Cooperative Extension Water Resources Program to turn a traffic triangle into a stormwater planter. The triangle, now entirely paved, will be redesigned to catch stormwater draining from one street and divert it into a central planter. A seating area will be enhanced with chess tables and benches for public use in collaboration with the local community members.

Meanwhile, the Trust for Public Land led a project at the Sussex Avenue School playground that incorporates GI solutions. The project features a new turf field, painted track, community garden, and rain garden.

Such projects further Newark DIG's overarching objectives of improving the quality of life, health, and viability of the City of Newark and its residents through the use of community-driven urban design, public policy planning, environmental and social justice advocacy, education and local capacity building.

Facilitated Discussion #4:

Using GI to create holistic, integrative water management strategies that address climate change, reduce water pollution and flooding, and increase local water supplies.

Key Points of Facilitated Discussion #4:

1. Design both systems and processes to be resilient.

- Resilience is increasingly important due to uncertainty regarding climate change.
- Communities should consider the role that GI can play in helping bounce back from emergency weather conditions such as flooding.
- GI is more adaptable than gray infrastructure, making it in some ways more adaptable to future conditions that might play out; GI projects can be moved, expanded or contracted more cheaply and easily than pipes.
- Integrated and flexible agency processes -- e.g. planning and management -- also can help avoid vulnerabilities.

2. Use modeling to design resiliency strategies, but don't expect models to provide all the answers.

- Most agencies are performing risk analyses to prioritize GI and gray infrastructure projects.

- Hydrological models are challenging in the face of climate uncertainty, because most modeling is based on historic trends. How do agencies assess risk when the baseline is going to move?
- Modeling 3 or 4 scenarios based on different climate assumptions (temperature, rainfall patterns, water levels, etc.) and developing strategies that can be modified depending on what drivers and conditions develop over time is best practice, but many agencies don't have necessary technical support or staff.
- EPA offers online "climate resilience evaluation and awareness tools" (CREAT), but agencies want more data about the effectiveness of these tools prior to adoption predicting utility operations and supporting missions.

3. Build capacity for monitoring.

- Given limitations of modeling, monitoring of implemented strategies has become increasingly important.
- Agencies must develop staff capacity to monitor how systems are working overtime.
- Effective monitoring can lead to new ideas for GI projects or innovative financing.

4. Share information and monitoring data with peers.

- Statewide programs and permit process can bring agencies together to share information.
- Experiential knowledge -- hearing stories of how situations were addressed -- is more helpful than raw data.

5. Collaborate with partner agencies to improve resiliency.

- Public and private partners should collaborate on resiliency strategies.
- Integrative planning can help agencies manage drinking water, stormwater and wastewater as part of a larger and stronger resiliency strategy.
- Collaboration is difficult but worthwhile: Different agencies have different mandates, and it takes staff time to reach out to potential partners.

Keynote Address

Milwaukee's Experience

Presenter: Karen Sands, Milwaukee Metropolitan Sewerage District

The Milwaukee Metropolitan Sewerage District (MMSD) serves 1.1 million customers across 28 municipalities. It averages 2.3 combined sewer overflow (CSO) events per year, with an overall CSO capture rate of 98 percent.

MMSD's 2035 Vision is a voluntary plan that calls for two strategic objectives: integrated watershed management; and climate change mitigation and adaptation, with an emphasis on energy efficiency.

It also sets the GI goals of capturing the first half-inch of rainfall that falls on impervious cover, and capturing and reusing the first quarter-gallon of rainfall per square foot. The 2035 Vision is the first permit to require GI. Cumulatively, GI measures put into place in 2013 as a result of the vision must have a design retention capacity of at least 1 million gallons. Each following calendar year during the permit term an additional 1 million gallons of GI retention capacity must be put in place.

MMSD also has a Regional GI Plan that calls for implementing the 2035 Vision and prioritizing regional funding decisions. Capital for projects comes from property taxes, while operations and maintenance come from user charges. GI projects are

determined by reviewing RFP's. Some funding is also allocated to municipalities and for small-scale neighborhood outreach programs. Among funded programs are:

- The Lake Michigan Rain Garden Initiative, which has subsidized the sale of some 30,000 rain garden plants since 2006;
- Rain barrels, with 20,000 distributed across the city collecting an average of more than one million gallons per storm event;
- Green roofs, subsidized at a rate of $5 per square foot;
- Green Seams, a program that has set aside properties of more than 24 acres through conservation easement or deed restriction, totaling more 2,600 acres since 2002.

The co-benefits of the Regional GI Plan are social, economic and environmental. Social co-benefits are projected to include 633 green operations and maintenance-related jobs at full implementation and 161 green construction jobs on average for 25 years.

Projected economic benefits include an increase in property values by $706 million across residential, commercial and industrial properties. The reduction in cooling needs is projected to be 16.5 million kWh per year, leading to a cost savings of $1.5 to $2.1 million per year.

Projected environmental benefits include 740 million gallons of new GI storage available per storm; and a reduction in total suspended solids of more than 15 million pounds per year. Carbon dioxide will be sequestered and emissions avoided at a rate of

some 73,000 tons per year at full implementation. Added trees will also remove criteria air pollutants.

As of December 2013, new GI was capturing 9.8 million gallons of additional stormwater out of the 740 million gallon goal.

General Conclusion & Summit Synthesis

While each discussion highlighted different themes as outlined above, some general conclusions and themes also emerged from the conference as a whole. Specifically:

CSOs and Municipal Separate Storm Sewer Systems (MS4s)

The type and scale of green infrastructure projects may vary in CSO and MS4 contexts. The large volume capture requirements of CSO control plans may emphasize larger, more centralized GI systems; MS4s emphasis on water quality may allow for a larger distributed network of installed practices.

Evolution of Maintenance

Discussion is no longer focused on barriers to maintenance. Instead the emphasis is on how communities are partnering to maintain GI and to maximize maintenance activities on both public and private property, and also to cover the costs of maintenance more effectively.

Partnerships

Communities are effectively partnering with other departments such as parks departments and non-profits such as watershed organizations to meet GI implementation goals. Timing becomes very important as communities build partnerships. This is especially true when independent sewer districts are implementing

GI and must coordinate with municipalities on project sites and project types. The need to time projects with all partners is an important key to reaching the best economic and community outcomes. Making connections to climate resiliency, disaster preparedness, and transportation goals opens the door to green infrastructure in unexpected places.

Community Amenities and Multiple Benefits

When evaluating stormwater or CSO control alternatives, the lowest cost option may not always be the best option because of the multiple social, economic, and environmental benefits possible with GI. While water quality is very important, the selling point is actually GI as a community amenity.