THREE

PEOPLE
People are central to solving Buffalo’s stormwater challenge. Buffalo Sewer is creating a green culture to support, advocate for, and implement green infrastructure. This chapter describes how community partners can help solve Buffalo’s stormwater challenge.

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Buffalo Sewer’s leadership begins with strong internal expertise in green infrastructure

Buffalo Sewer continues to be a leader in green infrastructure and is committed to building a culture that supports green investment throughout the City. While green infrastructure is becoming a well established set of technologies, very few agencies have deployed green infrastructure techniques across large regions to reduce stormwater runoff. Buffalo Sewer has taken a number of steps to build sustainable institutional knowledge, including:

- The establishment of Technical Advisory Committees.
- The design and construction of innovative green infrastructure projects.
- Collaboration with University of Buffalo researchers on a range of systems analysis projects.
- Regular discussion of best practices and lessons learned with the Green Infrastructure Leadership Exchange, an organization comprised of green infrastructure practitioners from municipalities across the country.

These initiatives are designed to build knowledge, establish best practices, and create a systemic understanding of green infrastructure so that Buffalo Sewer can implement green infrastructure to be more environmentally sensitive and equitable.

Buffalo Sewer’s Technical Advisory Committee

Buffalo Sewer convened a Technical Advisory Committee (TAC) to advise on best practices and help build a community of action around green infrastructure. The TAC included technical experts from government agencies, academia, community organizations, and local practitioners. The TAC members brought with them a wide range of knowledge and experience. Through regular meetings and focused topic discussions they helped translate national practices to the Buffalo context.

The TAC had three overall goals:

- Identify and provide guidance on technical issues related to green infrastructure.
- Identify opportunities and considerations for green infrastructure.

Figure 3.1: Buffalo Sewer Waterworx Pop-Up Park.
given the current state of knowledge and best practices surrounding the planning, design, construction, maintenance, and monitoring of green infrastructure.

- Provide recommendations for implementation of green infrastructure.

The primary role of TAC members was to participate in 6 monthly meetings and have discussions between meetings as part of Buffalo Sewer’s green infrastructure work. Members provided input to Buffalo Sewer based on their review of technical materials.

A summary of content for each meeting follows:

- **Meeting 1:** Kickoff Meeting - Project Background, TAC overview, Scope discussion for green infrastructure site selection and site investigation work.
- **Meeting 2:** Technical Issues - Site Constraints and Stormwater Soils.
- **Meeting 3:** Technical Issues – Vegetation and Changing Climate Considerations.
- **Meeting 4:** Opportunities Outside the Public Right of Way and Delivery of Green Infrastructure Programs.
- **Meeting 5:** Community Support/Community Awareness and Green Infrastructure Maintenance.
- **Meeting 6:** Draft Opportunity Report and Next Steps.

The outcomes of each meeting were summarized with technical issues and recommendations prepared. These recommendations have informed the findings of this report.

**Innovative Projects**

In addition to gathering experts and consolidating knowledge around green infrastructure, Buffalo Sewer is generating knowledge through the implementation of every project. The innovative projects Buffalo Sewer has completed so far have validated green infrastructure technologies and provided on the ground experience unique to Buffalo. For these projects, Buffalo Sewer examines the whole process including design, construction, and long-term performance. This establishes baseline knowledge and validates assumptions for larger scale planning. Buffalo Sewer has implemented a number of green infrastructure projects including:

- 9 miles of green streets in 17 different projects
- 6 green parking lots
- 224 green post-demolition sites
- Over 1,300 rain barrels

Buffalo Sewer was also the first sewer utility in the country to receive credit for demolitions within their LTCP. Building on the green infrastructure projects already completed by Buffalo Sewer, this report identifies opportunities to increase the scale and scope of green infrastructure implementation in the six priority CSO basins.

![Figure 3.2: Green post-demolition for enhanced stormwater performance](image)
Expert Collaboration

In addition to internal TACs, Buffalo Sewer engages external thought leaders and supports external green infrastructure knowledge building through expert collaborations. Buffalo Sewer is in regular collaboration with University of Buffalo researchers on a range of systems analysis projects and hosts the Research and Education in eNergy, Environment and Water (RENEW) fellowship program. Regular discussion of best practices and lessons learned also occur through the Green Infrastructure Leadership Exchange, an organization comprised of green infrastructure directors from municipalities across the country. Some experts that Buffalo Sewer has worked with in the past include:

- United States Geological Survey (USGS)
- University at Buffalo
- U.S. Environmental Protection Agency (EPA)
- US Army Corps of Engineers
- New York State Department of Environmental Conservation (NYSDEC)
Buffalo Sewer will need to build “communities of action,” or groups of partners and projects that can implement green infrastructure to meet Buffalo Sewer’s stormwater management goals. For example, in early green infrastructure work, Buffalo Sewer was able to work with the City of Buffalo and community groups to create green infrastructure installations on vacant land. By identifying a replicable opportunity, (green infrastructure on vacant land), a key partner (the City of Buffalo), and advocates (community members and neighborhood groups), Buffalo Sewer was able to implement green infrastructure on more than 200 sites. Getting to scale with multiple installations allows Buffalo Sewer and its partners to streamline project administration and can ultimately contribute to the longevity of the installations.

The Challenge of Incentives
Economic benefit is a major motivator for parties to implement green infrastructure. Stormwater fees are assessed in many cities to fund investment in stormwater green infrastructure and property owners may be motivated to implement green infrastructure to avoid fees. Other communities offer incentives to implement green infrastructure. Buffalo does not have a stormwater fee and has only limited incentive funds. Buffalo will need to rely on broader collective action that may be catalyzed by key investments but cannot be fully realized by Buffalo Sewer’s efforts alone.

Encourage Voluntary Green Infrastructure
A variety of strategies can be employed to encourage property owners and communities to implement green infrastructure on a voluntary basis. These strategies include:

- Encourage recognition and praise for green infrastructure projects with awards and media attention.
- Establish financial incentives with a grant program.
- Create resources for designers and developers by publishing standards, guidelines, and details to make it easy to incorporate green infrastructure into projects.
- Establish design and planning competitions.
- Create scholarships or awards for green infrastructure related thesis, dissertations, or research projects.

Fostering a Green Infrastructure Knowledge Base and Skilled Workforce
The more knowledgeable the workforce is about green infrastructure implementation, maintenance, and function, the more successful green infrastructure will be. Specifically, Buffalo Sewer is committed to working on the following:

- Training Buffalo Sewer staff and seasonal workers on green infrastructure with the National Green Infrastructure Certification Program (NGICP), which provides the base-level skill set needed to properly construct, inspect, and maintain green stormwater infrastructure.
• Creating a scholarship program for NGICP training for City of Buffalo residents.
• Incorporating green infrastructure into K-12 public school curricula and programs.
• Developing demonstration sites at schools.
• Hosting field trips for school children to green infrastructure sites.
• Regularly hosting Mayor’s Summer Youth internships for high school students.
• Hosting undergraduate interns and graduate student interns.
• Supporting organizations involved in green infrastructure workforce development.
• Providing tuition assistance to Buffalo Sewer staff.
• Creating a water-based curriculum with associates degree granting institutions.
• Supporting Buffalo Sewer staff with professional development classes and training around green infrastructure and other associated skills.
• Providing a career ladder for workers so they have the potential to develop from seasonal temporary laborers to designers or engineers.
• Creating summer-long youth programs in partnership with community organizations, such as the Waterworx program that was conducted in partnership with the Community Action Organization, to expose children to green infrastructure and green-infrastructure-related career options from a young age.

Focus on Community & Economic Benefits of Green Infrastructure

Green infrastructure can also provide significant economic and workforce benefit to Buffalo. Based on economic analyses conducted as part of Rain Check 2.0, every $1 invested in green infrastructure investment in Buffalo generates $1.52 in benefit to Buffalo’s economy. Also jobs in the green infrastructure sector have a higher median hourly income – $23.04 – than median hourly wage for the Buffalo metropolitan area ($17.77). The complete analysis can be found in Appendix D.
Buffalo Sewer does not have stormwater fees or incentives to encourage green infrastructure on existing properties. Thus, Buffalo sewer is exploring other strategies for encouraging private property owners to implement green infrastructure. Some possible groups for joint implementation or collaborative partnership include:

**Community Organizations**

In some cases, Buffalo Sewer is able to “piggyback” onto existing community improvement projects spearheaded by local groups, to provide additional benefit in the form of green infrastructure. As an example, a community group may be developing new parkland areas, and Buffalo Sewer can contribute funding that would cover the incremental cost of implementing green infrastructure technologies over traditional non-stormwater-based design.

**Municipal Properties**

Public property owners have a portfolio of properties that are likely centrally administered, have a similar land use or physical characteristics, and may have common maintenance requirements. In addition, municipal properties provide public benefit, ensuring that the investment creates common good.

**Portfolio Properties**

There are many owners who have a portfolio of similar properties and who could more easily implement green infrastructure across a building type or project type. These include commercial developers, such as retail property owners, as well as institutional owners who manage campuses of medical or educational buildings. They likely have significant existing land management responsibilities where green infrastructure maintenance could be absorbed.

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Figure 3.9: Educating the next generation of green infrastructure practitioners at Buffalo Sewer Waterworx event.
Proximate Properties
Studies have shown that people are more likely to take action if they see others doing similar things and that investment can inspire additional investment. In this case, being near each other allows for green infrastructure installations to be visible and become part of a community identity. Properties that are near each other can be optimized to function as a network, or can have shared administration or maintenance. These properties might be within a geographic boundary such as a neighborhood or be part of a common resource, such as a commercial corridor.

Properties with Similar Land Use
Properties that have a similar land use, such as churches or “big box” retailers may be interested in programs, incentives, and information sharing aimed to meet their specific needs. For example, most large retailers will have similar green infrastructure opportunities such as roof and parking lot installations. They may benefit from shared educational opportunities, incentive programs, and general community cohesion.

Properties Seeking Perceived Market Advantage
Increasingly, sustainability is becoming important to market advantage in real estate. This is one of the premises behind sustainability rating systems, such as ENVSION, LEED and SITES. In certain types of industries (for example high-tech fields) a highly sustainable development is seen as conferring a market advantage. Sustainability, particularly when it is visible and attractive, can make a property more attractive to prospective tenants or buyers and command higher rents. This may also be an incentive for developers to choose to implement green infrastructure.
Workforce Development is an important strategy in implementing green infrastructure in Buffalo and improving opportunities for City of Buffalo residents. In order for Buffalo to successfully implement green infrastructure projects, Buffalo needs a skilled workforce to construct and maintain these systems. Buffalo Sewer is committed to creating a pool of such skilled workers who can earn a good living working on green infrastructure.

Buffalo Sewer has taken a number of steps toward achieving this goal. Buffalo Sewer has enhanced its connection to schools and summer programs for children to encourage them to think about possible green infrastructure career paths and build a broader knowledge of green infrastructure. By creating internships, fellowships, and research opportunities, Buffalo Sewer is helping to create knowledge hubs, a trained workforce, and greater opportunity for city residents.

Buffalo Sewer will be hosting training through the National Green Infrastructure Certification Program (NGICP) for Buffalo Sewer staff. NGICP training will also be available to city residents to provide skills and training to communities that may not have many opportunities for career advancement, including those with only a high school diploma/GED.

The NGICP certification training offers the green workforce an opportunity to adhere to a nationally recognized standard that promotes exceptional job knowledge, skills, and abilities to build, inspect, and maintain green infrastructure systems. NGICP certification also enables employers to ensure that they are hiring qualified workers. Having certified individuals on staff demonstrates to those looking to install green infrastructure on their properties that a contractor has the relevant experience and skills to properly install these systems.

NGICP certification offers a training pathway for workers to access skills, contractors to find the most skilled individuals to hire, and property owners to know that those installing and maintaining their systems have the necessary skills to complete the work. Training Buffalo residents for these jobs also helps ensure that the dollars spent on green infrastructure stay in the City and its economy.

The only experienced and certified NGICP professionals in New York State are located in the City of Buffalo. Buffalo is also home to 1 of 21 NGICP trainers in the entire country. Buffalo Sewer is committed to developing the most skilled and knowledgeable individuals in the field of green infrastructure and hopes to expand the number of people in the region certified and trained in green infrastructure. Buffalo Sewer will continue partnerships with organizations that conduct workforce training, such as PUSH Buffalo and Groundwork Buffalo.

Figure 3.12: Workers installing a rain garden facility at JFK community center.
BUFFING A GREEN CULTURE
Working Collaboratively

Buffalo Sewer is committed to collaborating with property owners, organizations, and individuals across the City, ranging from homeowners to large institutions. Engagement with stakeholders throughout the process will lead to better projects, open more implementation possibilities, and allow more neighborhoods to benefit.

Finding Partners
Implementing green infrastructure in Buffalo will require partnerships on many levels — local government, community organizations, national organizations, and the private sector. Through series of meetings in 2018, Buffalo Sewer focused on publicizing its green infrastructure efforts in the City, future work and collaboration, and the challenges in implementing a large scale green infrastructure program.

Buffalo Sewer can support the vision and goals of other institutions and organizations by offering technical assistance, logistical support, data sharing, potential funding, co-applications for other grant applications, and shared outreach events with individuals and organizations interested in collaborating with Buffalo Sewer on implementation of green infrastructure.

Throughout the Rain Check program Buffalo Sewer has been coordinating with local government departments and agencies. The Buffalo Green Code emphasizes that landscape, parking and street design must go hand-in-hand with stormwater management and watershed protection efforts to be effective. Collaboration with local government is a key value and approach for Buffalo Sewer and is critical to implementing the LTCP and building a green culture.

Potential partnerships with local government agencies include:
- Buffalo Department of Public Works
- Buffalo Employment and Training Center
- Buffalo Municipal Housing Authority
- Buffalo Public Schools
- Buffalo Urban Development Corporation
- Buffalo Urban Renewal Agency
- City of Buffalo Permits and Inspections

Figure 3.13: Buffalo Sewer Community Meeting.
• City of Buffalo Mayor’s Office of Strategic Planning
• Empire State Development
• Erie County Environment and Planning
• Niagara Frontier Transportation Authority

In addition to local government, Buffalo Sewer is interested in partnering with local organizations and community groups. In addition to implementing green infrastructure projects, these partnerships can also further Buffalo Sewer’s equity goals through workforce development and training programs.

Potential partnerships with local organizations include:
• Buffalo and Erie Niagara Land Improvement Corporation
• Buffalo Green Fund
• Buffalo Niagara Waterkeeper
• City of Buffalo Block Clubs and neighborhood associations
• Clean Air Coalition
• Community Action Organization of WNY
• Community Foundation for Greater Buffalo
• Garden Walk Buffalo
• Grassroots Gardens
• GroundWork Buffalo
• GrowWNY
• Native Plants Working Group
• Olmsted Parks Conservancy
• PUSH Buffalo
• Western New York Land Conservancy
• Western New York Stormwater Coalition

Potential partnerships with national organizations with similar missions, include:
• Center for Neighborhood Technology
• The Nature Conservancy
• Trust for Public Land

Figure 3.14: Demonstrating porous asphalt on Clarendon.

Figure 3.15: Rain Check rain barrel being installed at a residential property.
Finally, many projects will need to be implemented by private property owners. Partners were identified in the **private sector**, including:

- Institutional or nonprofit land owners
- Design professionals
- Commercial property owners
- Developers
- Business trade groups

Property owners also play an important role in making green infrastructure a success by maintaining installations on or near their property. Meetings were held in 2018 to educate private developers on easily implementable, cost-effective green infrastructure measures that also comply with the Buffalo Green Code.

As planning and implementation progresses, Buffalo Sewer will continue to reach out to developers, businesses, organizations, institutions, and large property owners to identify more partners and expand green infrastructure opportunities. This engagement will ensure green infrastructure designs are responsive to the needs of all local partners and will foster a willingness for maintenance and support.

Buffalo Sewer can offer technical assistance, logistical support and potentially funding to individuals and organizations interested in collaborating with Buffalo Sewer to implement green infrastructure.
Buffalo Sewer is committed to partnering with local government agencies and departments as well as collaborating with partners across the City and from many types of groups and organizations. Green infrastructure is a new part of the Buffalo landscape and it is important for Buffalo Sewer to share how green infrastructure works and how it contributes to improving the performance of the sewer system and water quality.

Buffalo Sewer has been working to develop a robust set of educational tools and knowledge sharing platforms to communicate green infrastructure benefits.

**Rain Check 1.0**

The Rain Check 1.0 report described the stormwater challenge, the unique role green infrastructure plays in addressing it, Buffalo Sewer’s work, and Buffalo Sewer’s plan to take green infrastructure to the next level. Rain Check 1.0 focused on green streets, green parking lots, green demolition and vacant lot restoration, and rain barrels and downspout disconnection. The report is a valuable tool for engaging and educating the public around the stormwater challenge.

**Rain Check 2.0**

Building on Rain Check 1.0, this report is an engagement tool for the next set of projects in the Rain Check program. This report communicates the descriptive characteristics and contexts of the priority areas, possible approaches to implementation, and equity implications, as well as provide locations and strategies of potential opportunities for green infrastructure.

**Educational Materials**

Buffalo Sewer is developing tools and techniques to deliver green infrastructure content to audiences both inside and outside Buffalo Sewer.

In seeking to expand the scale and diversity of green infrastructure planning in Buffalo, Buffalo Sewer will need to meet with many partners to spread the word on how green infrastructure is a positive investment that will benefit individuals and the community. This will mean holding additional one-on-one meetings with potential partners, having open community meetings, and providing resources for private citizens to learn on their own. In order to reach diverse audiences in many different forums the Rain Check project has prepared a series of strong, clear, and easy to understand materials that provide the core of Buffalo Sewer’s educational material. These materials are briefly described here.
Why green Infrastructure works here

Depending on the size of your project, different requirements will apply. Post-construction stormwater runoff, using green infrastructure tools where practicable. The Green Code requires that all land development activity must manage construction and limiting impervious surfaces, can work together to keep water where it falls. Additionally, de-paving reduces the amount of paved surfaces to offer more green space to absorb water. These tools keep water out of the sewer system and transform your parking areas.

Green infrastructure solutions

Green infrastructure can make parking lots and driveways safe, attractive, and environmentally friendly. Porous pavement, or permeable asphalt, allow water to pass through to the ground. Rain gardens and street trees surrounding parking areas collect runoff and see how they might manage stormwater on a city street.

Who can use these solutions?

Anyone who owns a property with more than 1/4 acre (including most parking lots). Often lower, allowing developers to maintain green infrastructure are structures - the costs of installing and maintaining green infrastructure are generally lower than 1/4 acre ($1,000). They can also prevent stormwater runoff. These tools can improve the beauty, safety, and usability of your property.

One Page Partnership Handouts

These everyday spaces often include large stretches of asphalt that produce heavy loads of water. These tools keep water out of the sewer system and transform your parking areas. These everyday spaces often include large stretches of asphalt that produce heavy loads of water. These tools keep water out of the sewer system and transform your parking areas.

One Page Handouts

Everyday places for green opportunities

Trees, rain gardens, and permeable walkways in parking lot safer. Porous asphalt (on the Broderick Park’s porous parking lot) adds beauty to your property. Your parking lot add beauty and sustainability to your property.

Palm Card

This tool can be utilized in tabling events and can be left with groups after in-person meetings. It directs people to the Rain Check website to discover green opportunities and learn more about green infrastructure.

Signage

will accompany Buffalo Sewer green infrastructure projects. These signs will be installed at the site of any new green infrastructure and provide descriptions of how the green infrastructure works and some of the installation’s environmental benefits. These help residents to understand why these new landscape elements have been installed and their value to the environment.

Demonstration Games

can be used in conjunction with the palm card and presentation for groups that have interest in partnering with Buffalo Sewer to take green infrastructure to the next level. The tool describes the Rain Check 2.0 project, the desire of Buffalo Sewer to partner with developers, businesses, churches, and large property owners to explore green infrastructure opportunities, and shows examples of how green infrastructure can be incorporated into different kinds of spaces. It also directs people to the Rain Check website to learn more.

Green Infrastructure Online tour

offers highlights from Buffalo’s first generation of Rain Check to show a number of green infrastructure projects on roadways, parking lots and vacant lots across Buffalo.

Figure 3.20: One Page Handouts.

Figure 3.21: Screen Shot of the Online Tour.

Figure 3.22 Buffalo Sewer Waterworx session using demonstration game
Website

During the Rain Check 2.0 process a **Website** was created and raincheckbuffalo.org is home to a wide range of materials including easy-to-understand articles, interactive content, and a catalogue of Buffalo Sewer’s Completed projects. These have been developed such that they can be used privately by visitors to the site and by Buffalo Sewer staff in meetings with a wide range of forums. The website includes education resources about green infrastructure and the Rain Check 2.0 program.

**Green Opportunities** – under this section there are three pages to introduce people to the Rain Check program and partnership opportunities with Buffalo Sewer. They also give people ideas for everyday actions that they can take to improve the local environment.

**Learning** – these pages provide a range of educational pieces and people interested in learning more about green infrastructure and Rain Check should be directed to these pages.

**Green Infrastructure Tools** – this page includes descriptions of the various green infrastructure tools available.

**Our Stormwater Challenge** – this page describes the stormwater challenge and why Buffalo needs to find ways to address it.

**How Green Infrastructure Works** – this page describes how green infrastructure works and can be part of the stormwater solution.

**Benefits of Green Infrastructure** – this page lays out the benefits of green infrastructure including cost savings, investment in neighborhoods, greening and beautifying neighborhoods, improving safety and public health, and creating jobs.

**Green Infrastructure in Buffalo** – this page describes how green infrastructure has been implemented in Buffalo, including an online tour, a link to the Rain Check 1.0 report, and a link to the Long Term Control Plan.
Buffalo Sewer is committed to collaborating with partners across the City and across many types of groups and organizations. Public outreach by Buffalo Sewer should be a team effort in partnership with other local government agencies and departments. As Buffalo Sewer leverages these communication tools to advance implementation of Rain Check 2.0, it will be critical to build on the lessons learned through the first generation of Buffalo green infrastructure programs. In order to make decisions and install projects that can minimize harm and promote benefits to marginalized communities, Buffalo Sewer and its partners will prioritize engagement that leads to building relationships and building trust with communities, especially communities that have been historically underserved.

**Principles of Successful Engagement**

Highlighted in the Rain Check 1.0 report, key lessons for leveraging communication tools are as follows:

**Tailor engagement approaches to meet the needs of diverse communities.** Buffalo is made up of many different neighborhoods shaped by diverse cultures and histories. Engagement approaches must respect this diversity and find ways to make green infrastructure concepts relatable. This includes presenting materials in several different formats and tailoring materials to reflect the specific population, languages, buildings, institutions, landscapes, and climate of the project location.

**Engage individual property owners.** Property owners play an important role in making green infrastructure a success, as they can act as stewards to maintain installations on or adjacent to their property. As Buffalo Sewer broadens its range of projects and the areas of the City where it is installing green infrastructure, it will need to continue to bring individual property owners into the process early, and secure their support and commitment over the long run. To the extent that Buffalo Sewer will rely on private property owners, large businesses, or major institutions to install and maintain green infrastructure, it may be challenging to promote green infrastructure in areas where residents are less likely to own their own properties, live on smaller properties with less available space for green infrastructure installation, or lack the financial resources to feel confident about long-term maintenance of the green infrastructure installations. Communities with these challenges could be targeted for additional support.

**Leverage green infrastructure as a visioning tool that can help shape the future of communities.** Green infrastructure can be a tool to shape the physical environment residents and stakeholders envision for their community. Implementation of Rain Check 2.0 can greatly benefit from partnering with community groups and neighborhood-level planning efforts. Communication materials can help position green infrastructure as a tool to advance neighborhood goals and aspirations.

**Build “Champions” for green infrastructure in neighborhoods across the City.** Neighborhood-level stakeholders play an important role...
in connecting community members to public engagement processes, while opening doors to a range of audiences — property owners, tenants, customers, community institutions and their members, neighborhood or block clubs and business organizations, real estate professionals, and/or regional, issue-focused organizations. Buffalo Sewer will continue to explore opportunities to identify and empower community champions or local ambassadors for green infrastructure.

**Build Trust** through transparency, creation of a technical resource committee, public awareness campaign, clear, open and honest communication, and prompt, courteous, and respectful customer service. This work requires sustained investments of time, energy, and resources into building relationships and building trust with communities, interaction by interaction, meeting by meeting, project by project.

**Listen First** to the goals and aspirations of partners, stakeholders, and the community. Buffalo Sewer recognizes that engaging the community must be a conversation and is committed to listening first to the community vision. Only then can Buffalo Sewer understand how its green infrastructure work can support that community vision.