

A report commissioned by





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BACKGROUND

Large, impervious surfaces such as basketball courts and parking lots, public ownership, and the opportunity to advance environmental education: these things make schoolyards excellent places to implement green stormwater infrastructure (GSI). However, water utilities, water departments, and other municipal environmental agencies seeking to implement GSI projects in partnership with city and county school departments and school districts are facing a variety of challenges.

This report outlines these challenges and highlights examples of partnerships and projects that have had success in addressing them. The report was produced through the Green Infrastructure Leadership Exchange (the **Exchange)** Collaborative Grant Program to help inform future GSI on schoolyards throughout the nation.



METHODOLOGY

The Green Infrastructure Leadership Exchange (Exchange) is a unique and highly connected peer learning network of 60 organizations across North America, whose mission is to build a practical playbook that any community can adopt to implement green stormwater infrastructure equitably and affordably. Exchange members primarily include local governments who are the vanguard of their field.

To create this report, the Children & Nature Network surveyed all Exchange members to get a baseline understanding of how water utilities, departments, and other municipal environmental agencies (water agencies) are engaging with schools, school departments and school districts to implement GSI on schoolyards and the challenges they are facing. Following the survey, eight programs were selected for interviews. Of those eight programs, four were chosen to provide case studies illustrating the most innovative or comprehensive ways of addressing the top-ranked challenges members cited in the initial survey. Information for the report was also gathered from the Exchange's Schools & GSI Working Group learning sessions and from the Exchange's website.

THANK YOU

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BARRIERS & SOLUTIONS TO IMPLEMENTING GSI ON SCHOOLYARDS

Water agencies face many barriers to implementing GSI on schoolyards. Exchange members described a spectrum of challenges: perceived high cost of GSI; staff turnover; concerns around safety; coordination with other capital projects; competition of GSI with other play and educational elements; ADA compliance; seasonal challenges; and legal concerns, risks, and obstacles. While all of these challenges are significant, this report will focus on the four major barriers that were the most frequently cited:

- 1. Gaining buy-in from the school and school district
- 2. Developing partnerships and interagency agreements
- 3. Securing sustainable and flexible funding
- 4. Maintaining GSI

While these challenges are significant, Exchange members and their partners are implementing many different strategies to address them. Many of the water agencies interviewed for this report emphasized that the positive impact of working with schools makes it all worth it. There is no single or universal solution that will solve everything. Solutions depend on specific contexts and local dynamics, and it is likely that a host of approaches and strategies will be required to make any program successful.

Case studies in this report will cover some of the promising approaches that Milwaukee, WI: San Francisco. CA; Philadelphia, PA; and Washtenaw County, MI are using. The next section will highlight additional approaches that are being utilized.



BARRIER GAINING BUY-IN FROM THE SCHOOL AND SCHOOL DISTRICT

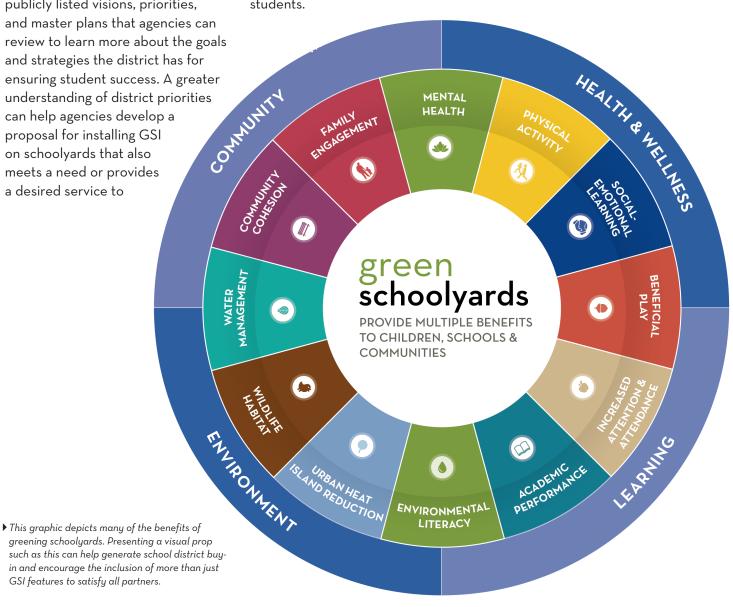
Many water agencies have difficulty gaining buy-in from school and district administrators to implement GSI on schoolyards. It can be hard to know where to start in making connections with the school or school district and it may not always be clear who the best initial contact person might be. At first glance, it might not be clear to the school or school district where the alignment is between schoolyards and GSI.

SOLUTION #1

IDENTIFY SCHOOL DISTRICT PRIORITIES

Before reaching out to the school or school district, it is useful to be familiar with their priorities, and to be able to speak to the ways in which a GSI project would promote them. Most school districts have publicly listed visions, priorities, and master plans that agencies can review to learn more about the goals and strategies the district has for ensuring student success. A greater understanding of district priorities can help agencies develop a proposal for installing GSI on schoolyards that also meets a need or provides a desired service to

the school. For example, adding or integrating features such as outdoor classrooms and nature play areas to a schoolyard through GSI development can support hands-on and socialemotional learning opportunities for students.



SOLUTION #2

FIND A CHAMPION, THEN BUILD A TEAM

Once a school's or school district's priorities are identified, finding an "inside" champion or advocate can be the best way to make inroads with the district or an individual school. For example, Boston Water and Sewerage Commission contacted the Sustainability Director for Boston Public Schools to start the GSI conversation. This district staff member's scope of work overlapped with the Commission's interests, and they were able to bring them in for

deeper engagement with the school district as a whole.

These champions serve as an entry point for larger discussions, but should not be the main or only contact for all work going forward. The champion can help open the door and build a team to ensure diverse perspectives and project sustainability, including continuity during staffing transitions.

SOLUTION #3

USE GSI FOR LEARNING

ENLIST STUDENTS TO LEAD DESIGN. MAINTENANCE. AND RESEARCH

In Washtenaw County, MI (one of the case studies presented in this report) school district buy-in is supported and sustained through ongoing student engagement with GSI. Green schoolyard programs, such as Evergreen in Canada, and those in San Francisco and New York City, put students in the driver's seat for designing and stewarding their green schoolyards by devoting class time and after-school clubs to GSI. This student engagement is what keeps some districts invested.

Suitable Standards for Stormwater/GSI



- GI curriculum intended for all schools, not just 5 pilot schools
- · Curriculum Team identified the following suitable standards:

Grade	Standard	Notes
5 th	5-ESS2-1	 Use a model to describe the cycling of water on Earth between the geosphere, biosphere, hydrosphere, and atmosphere through evaporation, precipitation, absorption, surface runoff, condensation, and transpiration.
5 th	5-ESS3-1	 Obtain information about ways communities reduce the impact on the Earth's resources and environment by changing an agricultural, industrial, or community practice or process. Sewage/water/stormwater treatment
5 th	5-ESS3-2 (MA)	Test a simple system designed to filter an impurity out of water and propose one change to the desig to improve it. Gl is primarily a filter for pollutants in stormwater
7 th	7.MS-ESS3-4	Construct an argument supported by evidence that human activities and technologies can be engineered to mitigate the negative impact of increases in human population and per capita consumption of natural resources on the environment. Gi's impact on the amount and quality of water/groundwater/runoff Pollutant removal, flood reduction, impervious cover removal, etc.
7 th	7.MS-LS2-5	 Evaluate competing design solutions for protecting an ecosystem. Discuss benefits and limitations of each design (also fits well with 7.MS-ETS1-2).

▶ This chart depicts the Boston Public Schools curriculum that best aligned with teaching students about GSI.

WRITE SPECIFIC. STANDARD-ALIGNED LESSONS AND IMPLEMENT **PROFESSIONAL DEVELOPMENT TO** SUPPORT THEIR USE

The Boston Water and Sewer Commission created GSI curriculum that was developed with a local consultant for 5th and 7th grades (a scan of grade-level standards that best support GSI on schoolyards identified these age groups). The curriculum is intended for use in all public schools in the district, not just those with GSI. In 2018, the project team piloted a professional development training for teachers, and they plan to incorporate participants' feedback on the curriculum prior to rolling it out across the Boston Public School District. The curriculum can be found here, with a snapshot shown on the previous page.

The City of Omaha's Stormwater Program similarly supported the development of elementary, middle, and high school lesson plans that align with state standards and incorporate the use of GSI into the curriculum. The lesson plans were developed through an Urban Waters Grant with the University of Nebraska. Graduate students reviewed the state math and science standards to see which ones aligned with GSI and stormwater. The sample lesson plans were then developed to share with teachers so they could easily utilize them in their classrooms, adapt them to their own ideas and students, and share with others.

▶ GET TEACHERS **COMFORTABLE WITH TEACHING OUTSIDE.** AND IDENTIFY WHICH OF THEIR CLASSES COULD BE **TAUGHT OUTDOORS**

Many programs believe that crosscurricular lessons that are being taught inside can be adapted to be taught outside, given appropriate support. The biggest barrier to doing this seems to be classroom management in an unstructured outdoor space. By identifying classes and curriculum that are well-suited to outdoor learning and by providing training and support to teaching staff, GSI can be further integrated into student learning.

The sunsetted Boston Schoolyard Initiative transformed every elementary and middle school in the district into a place of learning and play between 1995 and 2013. The initiative, in partnership with Boston Public Schools, helped to develop science and reading curricula as part of its core programming, but it also designed its schoolyards to facilitate the endorsed curricula. The initiative provided professional development for teaching staff to support outdoor instruction and developed a corollary guide to showcase what can be installed in schoolyards to support student learning, such as local stone for geology, rain gauges and thermometers for weather tracking, and whiteboards in the outdoor classroom area.



BARRIER DEVELOPING PARTNERSHIPS AND INTER-AGENCY AGREEMENTS

It is not enough to gain buy-in for the project; there must also be an intentional process of partnership development to ensure the long-term success of any project. There are many barriers (real and perceived) to establishing and maintaining collaborative partnerships with water agencies. Building relationships, developing ways of working together, and understanding agency processes and concerns takes time and presents hurdles and obstacles that can be difficult to navigate.

One common challenge is creating an inter-agency agreement. Creating a legal agreement with a water agency can be challenging enough; adding another agency such as a school district, with its own processes and procedures, is even more difficult. In creating memorandums of understanding (MOUs) and memorandums of agreement (MOAs), agencies often realize that they have different considerations and concerns that need to be articulated. These may create conflicts that need resolving within the agreement, or one agency may simply not see the need for including a consideration or concern of another agency. Sometimes, just the idea of setting up an MOU or MOA can slow or even stop partnerships from developing. Such agreements and negotiations can be even more daunting when land ownership and long-term maintenance are part of the discussions.

SOLUTION #1

DEVELOP A PARTNERSHIP BETWEEN THE WATER AGENCY AND THE SCHOOL DISTRICT

Building partnerships at the school district level is instrumental for the long-term success of GSI on schoolyards. Partnership development takes time, effort, and regular meetings, but the impact of building strong relationships is pivotal. Giving each agency the opportunity to explain their priorities, goals, and visions is essential for a committed partnership.

Space to Grow: Greening Chicago Schoolyards is a partnership comprised of three municipal agencies (Metropolitan Water Reclamation District of Greater Chicago, Chicago Department of Water Management,

and Chicago Public Schools) and two non-profit partners (Openlands and Healthy Schools Campaign). The program partners spent 18 months building a shared vision and goals for Space to Grow while they piloted four schoolyard transformations that included GSI. During the pilot stage, partners built trust and worked through existing issues before a larger program commitment was made. As a result of the pilot project, partners agreed on a school selection process that weighs each of their priorities to ensure that everyone's needs and interests are met in exchange for their investments.

SOLUTION #2

MAINTAIN COMMITMENT AND BE CREATIVE IN CREATING INTER-AGENCY AGREEMENTS

A shared commitment to the vision of the program is key to getting to a signed agreement between agencies, as well as understanding where there are potential points of tension or conflicting needs or interests. While difficult to create, these agreements can provide a mechanism for collaboration between departments and detail important logistics: how

bidding and payments to contractors will work, who owns and/or is responsible for the GSI and for how long, how payments will be made, and what budget allowances exist. Taking the time to lay out each agency's needs and terms is also integral to building and maintaining trust, as these agreements usually last several years or more.

Exchange members have found other strategic, creative ways of supporting the process of creating inter-agency agreements. Milwaukee Metropolitan School District (MMSD) staff helped to gain buy-in to the process by engaging their legal staff from the beginning so that they were invested and able to offer insights into potential barriers. The City of Southfield, MI was engaged in a regional peer network supported through an EPA watershed grant that allowed agencies to share materials and MOAs, enabling them to avoid

starting from scratch in creating agreements. Internal champions like those in Boston Public Schools and Boston Water and Sewer Commission literally walked their MOA to their respective departments to speed up the process.

SOLUTION #3

CREATE DESIGN GUIDELINES IN PARTNERSHIP WITH THE SCHOOL DISTRICT

Many schoolyard greening programs have either created or are creating GSI design guidelines for their programs. While they take time to develop, these design guidelines help to ensure that GSI and other features meet the competing needs and concerns for the school district. Space to Grow has created internal design guidelines for contracted designers that meet the needs of their program and partners. Providence and Oakland are looking to do the same for their green schoolyards programs. The City of Omaha Stormwater Program worked with Omaha Public Schools to create design guidelines for GSI that were eventually integrated

into Omaha Public Schools design requirements for all new construction and renovations. Miami Dade School District created school boardapproved school garden design guidelines to ensure support and alignment of school gardens from the central office.

SOLUTION #4

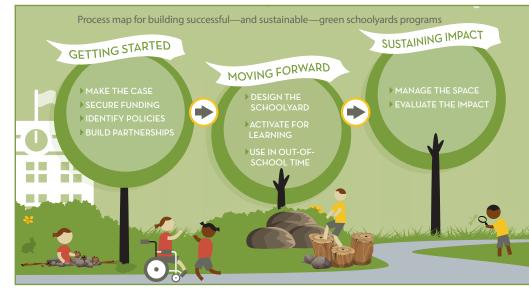
EXPAND PROGRAM PARTNERS BEYOND SCHOOL DISTRICT AND WATER AGENCY

At a minimum, the school district and water agency need to be part of a partnership to implement GSI on schoolyards, but inviting more organizations or agencies to the table can result in more kinds of support for all facets of the project. Partners, such as parks departments, community-based organizations, or a local nonprofits, can support more schoolyard features and help with community engagement for designing, use, and stewardship of the GSI features. They can also take some of the pressure off of the two municipal agencies, which may have narrower missions. See the graphic on the right for examples of how additional partners can support the holistic design, use, and stewardship of GSI on schoolyards.

Space to Grow: Greening Chicago Schoolyards is one model where many partners have come together to create a shared vision for what Chicago Public schoolyards could be. In contrast, Boston's pilot GSI on schoolyards program between Boston Sewerage and Water Commission (BWSC) and Boston Public Schools began with just those two partners. After the pilot phase of the program, BSWC's commissioners decided that they should not be leading this effort themselves and expanded the partnership to include Trust for Public Land, which will work with the school community to design the schoolyard as well as help raise funds for other aspects of the program.



- Water Utility
- Park Agency
- Mayor's Office
- **Community Organizations**
- Transportation and/or Planning **Departments**
- School District, Superintendent's Office, Capital Improvements, Curriculum Department
- Health Departments
- Nonprofits
- Universities
- After School Program Providers

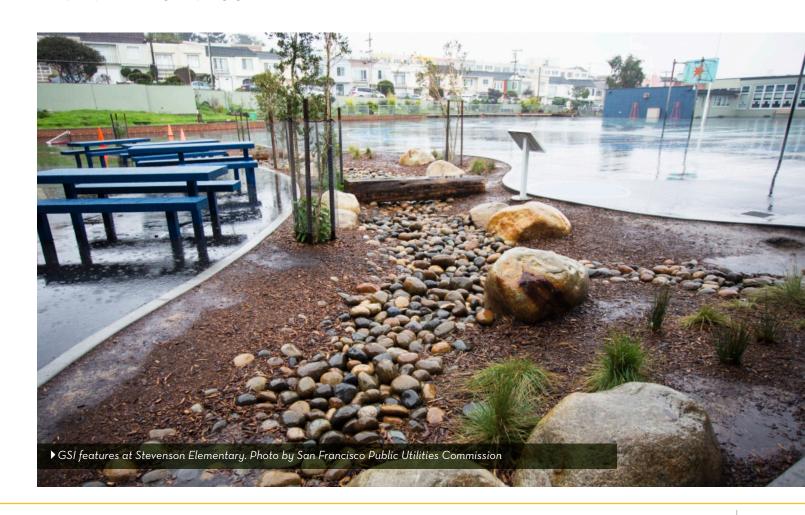


SOLUTION #5

COMMUNICATE FREQUENTLY AND FOLLOW UP AFTER IMPLEMENTATION

Some of the City of Southfield, Michigan's success in bringing GSI to schoolyards is due to its commitment to regular communications with partners and schools, including following up after the GSI is installed. Understanding that GSI needs to function for the long-haul to be a worthwhile investment, Southfield set up a system to regularly engage

partners and schools to ensure this sustainability. Their staff are committed to emailing, calling, and meeting with project participants from the schools that they have worked with to learn about their successes and any challenges they may be facing.



BARRIER SECURE SUSTAINABLE AND FLEXIBLE FUNDING

Exchange members described a variety of specific challenges related to funding GSI on schoolyards. In some situations, water agencies involved in schoolyard programs face challenges in justifying the allocation of funds for non-GSI features. While water agencies generally direct their funding solely to support stormwater capture on schoolyards, the school community may also be interested in the addition of features such as benches, playground equipment and signage.

Conversely, if a water agency is not fully funding the GSI on a schoolyard, it can sometimes be hard to convince schools to pay or fundraise for it. When a green schoolyard initiative is balancing multiple priorities and interests, it can be difficult to make the case for paying for GSI features that may be perceived as providing little value outside of stormwater capture.

SOLUTION #1

DIVERSIFY FUNDING SOURCES

Partnerships between multiple entities that share a capital budget can develop a larger pool of money for features beyond stormwater capture. (Additionally, economies of scale can lower costs for all partners.) For example, Space to Grow's nonprofit partners, Healthy Schools Campaign and Openlands, raise philanthropic and corporate dollars to support partner and community engagement, programming, professional development, and stewardship of the transformed schoolyards. Another example is the Trust for Public Land's (TPL's) New York City Playgrounds Program. The

program began transforming New York City schoolyards in 1996, originally to meet walkability goals. The program's goals were expanded through the city's sustainability plan, OneNYC. The Playgrounds Program has since partnered with the city's Department of Environmental Protection to fund green infrastructure interventions for school campuses. To date, the program has transformed over 200 schoolyards throughout the city's five boroughs. The program uses money earmarked for city park development and GSI, as well as philanthropic dollars, to fund the capital and maintenance costs of these projects.

SOLUTION #2

SEEK MUTUALLY BENEFICIAL SOLUTIONS

When programs need to raise the additional funding needed for GSI on schoolyards, a clear and explicit explanation of the unique and multiple benefits of GSI on schoolyards-and how those benefits support other project priorities-can strengthen the case. Designing these features with multiple benefits in mind, such as porous playground surfacing under playground equipment, or a seating area that doubles as a detention area during heavy rains, can deliver features that double as stormwater capture. In

Boston, partners identified alignment between the current Boston Public Schools 10-year capital plan and the Boston Water and Sewer Commission's areas of concern for phosphorus loading in the Charles River. This overlap in interests created a stronger argument for the installation of GSI in tandem with other features, such as playground equipment and outdoor classrooms, at five schools.

BARRIER MAINTAINING GSI

Maintenance of GSI on heavily used schoolyards can be challenging. Concerns include the lack of staff to maintain GSI, supporting the coordination of maintenance, and the need for long-term maintenance. Maintenance staff at schools, whether contract or employee, may be transient or lack appropriate professional training. Additionally, the schoolyard is often owned by the school district and not the water agency that installs the GSI. Spending public funds on property owned by another taxing body is often hard to justify to the voting public. However, the majority of a school district's funds are allocated for teacher salaries, with comparatively little money allocated for the capital or maintenance costs of facilities.

SOLUTION #1

JOB TRAINING

Partners in Baltimore, MD have led all-day or part-day trainings for school district facilities staff who maintain school grounds. The training is conducted by the Maryland Association of Environmental and Outdoor Education and the National Wildlife Federation's Green Schools Program. Stormwater capture work is led by Blue Water Baltimore and is tailored to facilities staff, teachers, and grounds crew members.

In the summer of 2019, Baltimore, MD and Gary, IN will be piloting high school youth summer programs to maintain green infrastructure on school grounds and park property, respectively. This is a great opportunity to expose youth to green infrastructure, green jobs, and to have trained staff and supervisors overseeing GSI during the summer months, when volunteer capacity to maintain green schoolyard features often wanes.

Additionally, America's Water Infrastructure Act, which was passed in 2018 with the help of San Francisco Public Utilities Commission's advocacy work, focuses on having a skilled

workforce to support the development and repair of US water infrastructure. As a result, the US EPA will administer a grant program to support innovative workforce development programs. This budget is \$2M over two years and seems to allow for GSI, but will depend on the grant program guidelines. This funding stream could potentially help support water agencies in creating or expanding job training programs to include GSI installation and maintenance, which may help address the lack of GSI maintenance knowledge in the field as a whole (a known barrier to implementation).

SOLUTION #2

MAINTENANCE GUIDES AND INTERPRETIVE SIGNS

Another way to bolster maintenance efforts is by providing supplemental guidance, both directly to trained staff and on-site. Water agencies such as Seattle Public Utilities in Washington and Montgomery County Maryland's Department of Environmental Protection have both created sitespecific maintenance guides for

installed GSI. Montgomery County's guides include detailed information about what is planted at each site and how to maintain the plantings. Seattle has designed and installed interpretive signs to help in a similar way.

SOLUTION #3

SUSTAINED, ONGOING COMMITMENT

When starting a new program, all involved agencies and organizations should be realistic about how they will support the program and its GSI elements going forward. The City of Southfield recommends regular communications and dedicated follow-up after implementation, even if a program has sunsetted. Seattle Public Utilities suggests that dedicating sufficient and consistent staff time to support GSI on schoolyards is imperative for the

long-term sustainability of the capital investments being made. Ideally, all partners need to be able to increase current capacity or re-allocate existing resources to ensure longterm success.

CASE STUDIES AN INSIDE LOOK

Green Infrastructure Leadership Exchange members were surveyed and interviewed about GSI implementation with schools. Water agencies in Milwaukee, WI; Philadelphia, PA; San Francisco, CA; and Washtenaw County, MI, are finding unique ways of addressing the barriers identified in this report. These barriers include garnering school district buy-in; interagency agreements; funding models; and maintenance of GSI. Case studies of these four communities offer an

in-depth look into their successful use of creative strategies such as conservation easements, outside funding, intensive partnership development, and master rain gardeners.



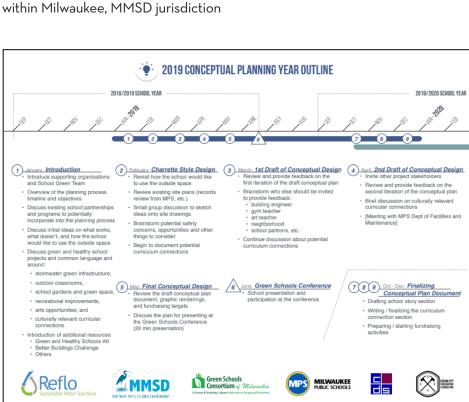
PROGRAM BACKGROUND

The Milwaukee Metropolitan
Sewerage District's (MMSD's)
commitment to green stormwater
infrastructure (GSI) is one piece of
a multi-tiered approach to meeting
their 2035 vision for zero basement
backups, zero overflows, and improved
water quality. MMSD staff believe that
schools offer great opportunities for
GSI because the impact of GSI on
schoolyards goes beyond removing
impervious surfaces.

In 2015, MMSD made a strategic effort to work with schools to capture stormwater. Rather than pursuing projects with individual schools, they focused their efforts on gaining district-wide buy-in. While they started by partnering with schools within Milwaukee, MMSD jurisdiction

reaches beyond the city's borders. In coming years, MMSD would like to expand these efforts to other school districts as well.

MMSD supports GSI on schoolyards in two ways. The agency funds five conceptual schoolyard designs per year, a process led by their nonprofit partner Reflo. Schools are chosen through an application process and are supported for a year in developing the concept plan (see graphic below). During the conceptual planning process, MMSD outreach coordinators and project managers attend the meetings to link attendees to programs and opportunities with MMSD beyond the schoolyard for more holistic engagement.



▶ Outlining processes and setting expectations can help ensure success of GSI at schools.



PROGRAM PROFILE

ORIGIN:

Compliance with WI Department of Natural Resources, WI Pollutant Discharge Elimination System Permit

SERVICE AREA:

MMSD is a regional government agency that provides water reclamation and flood management services for about 1.1 million people in 28 communities in the Greater Milwaukee Area.

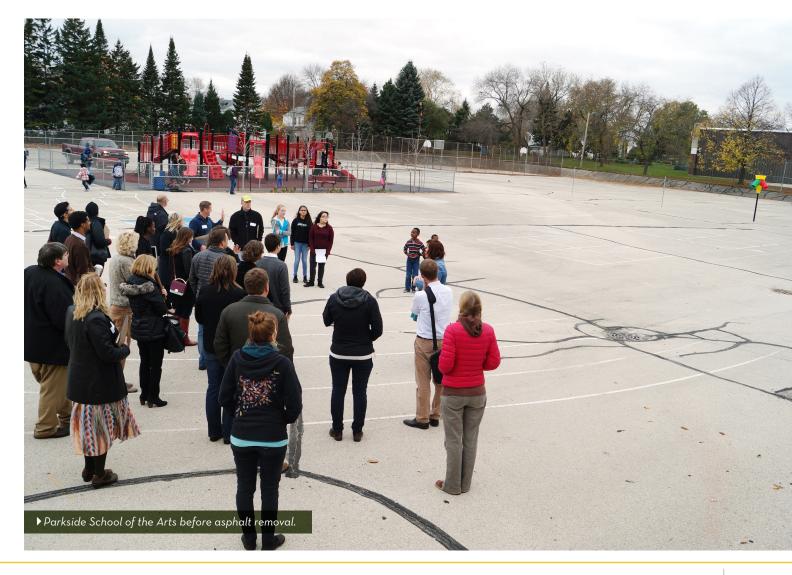
STRUCTURE:

MMSD is a separate agency from the City of Milwaukee (which owns the land that the schools sit on), and the Milwaukee Public School District (MPS) is an independent agency with a voter-elected school board.

MMSD is currently the main funder of the conceptual plans, though the Fund for Lake Michigan is also a supporter. Other nonprofits and universities donate their time and materials. MMSD has a two-year contract (2019-2020) with Reflo for \$250,000 to lead the staffing for 10 conceptual plans and to support schools to secure additional funding for implementation.

MMSD also provides reimbursable funding for larger capital costs through their Green Infrastructure Partnership Program (GIPP). The process to obtain GIPP funding includes submitting

an eight-page application that is reviewed by a five-person team. GIPP applications must come from the property owner (or include a letter of support). For work with Milwaukee Public Schools (MPS), the applications usually come from the school directly. Other private and public properties are also eligible for this funding. GIPP pays \$1.76 per gallon for up to 50% of the capital costs for a project. MMSD dedicates about \$2 million in capital funding for this program each year.



SOLUTIONS IMPLEMENTED

▶GAINING BUY-IN AND BUILDING PARTNERSHIPS

Having a nonprofit consultant/ partner like Reflo (which had existing relationships with MPS) made working with the District much easier. The MPS administration doesn't have a strategic priority or policy about sustainability, so project partners have been relying on growing grassroots excitement within the district to advance their goals and garner support. At individual schools, the teaching staff have been early adopters and have advocated for wider support among students and community members. The interest they've garnered, along with programs and events that support GSI, such as the Green Schools Consortium of Milwaukee annual conference, were instrumental in leading MPS and the City to implement GSI projects on their properties. MPS Facilities and Grants Departments have begun to help streamline the process for GSI at schools and are a resource for schools.

Photos of schoolyard transformations in Milwaukee and elsewhere have been key in making the case to MPS administrators. The reaction of administrators is often. "This makes a ton of sense, why aren't we doing this?"

SECURING FUNDING

Outside of MMSD's funds. philanthropy has funded the non-GSI elements of the projects. Reflo is writing case studies on schoolyard transformations to date, with the aim of getting MPS and others to invest in capital costs. In current designs, 70%-90% of costs are related to GSI.

To expand how funders and MMSD think about the full components of schoolyard designs, Reflo has begun to shift their language to include terms like "outdoor educational elements," "healthy food access," and "recreational improvements."



MAINTAINING GSI

MMSD's program has two approaches to supporting GSI investments on school sites: legal agreements and providing training to support maintenance staff.

MMSD created a three-way legal agreement that includes the City of Milwaukee (which owns the land). MPS (which manages the property), and MMSD. The agreement covers funding and maintenance, and includes a conservation easement. In 2014, MMSD started using conservation easements on projects of \$25,000 or more in order to ensure the ongoing maintenance of the GSI. The conservation easements give MMSD the right to access the land where the project is installed and includes a map with the project location, the property description, what the project is, its size, and what will happen if the project isn't maintained. The conservation easements last ten to twenty years.

MMSD, MPS, and the City of Milwaukee sign the conservation easement after project completion. MPS is responsible for the maintenance of the GSI on their school site. While the janitorial staff are responsible for the maintenance of the GSI, they don't have appropriate training and instead look to the school's green team to do the maintenance. With a recent installation. Reflo asked one school's landscape architect to help the green team and janitorial staff identify weeds versus native plants

several months after installation. Reflo also provided plant photos and the planting design. The school's staff responded so favorably to this training that they asked for their students to be trained (since they help with the maintenance). potentially on an annual basis.

MMSD and Reflo look forward to supporting GSI with half- to fullday training sessions for janitorial and facilities staff who maintain the installations in coming years. The partners would like to create easy to understand, school-specific maintenance plans to better equip staff to use and maintain their spaces. MMSD hired a consultant to create local GSI maintenance standards and is considering having an on-call maintenance team connected with a workforce development program. Reflo is also looking to start a recognition program for green teams and janitorial staff in another effort to support their GSI projects.

DUSING GSI FOR LEARNING

Reflo and MMSD have not yet created GSI lesson plans, but instead support training to help staff become comfortable teaching outdoors and to make them aware of what can be taught outside. In the design process, teachers are asked at the outset to consider what types of lessons they would like to teach outside. Schoolyards are then designed to include spaces that support that instruction.



RESOURCES CREATED

The MMSD program includes a conservation easement where the property owner has installed green stormwater investments on school sites, which are:

GREEN INFRASTRUCTURE GUIDE FOR SCHOOLS

LEGAL AGREEMENT



MMSD'S LESSONS LEARNED

- Recruit outside partners whenever possible. In this case, Reflo helped facilitate partnerships with the school district and individual schools.
- Be patient and persistent. Nothing worthwhile is easy!
- · Bring other players, such as neighborhood groups and community organizations, into the mix to help with engagement, maintenance, and funding.
- · Try things. It's okay to fail and evolve. You will learn and change your ways of working, such as MMSD's shift from a funding formula based on square footage to gallons of stormwater captured.
- Drum up enthusiasm and a commitment to keep the project moving forward.



TRY THINGS. IT'S **OKAY TO FAIL** AND EVOLVE. YOU WILL LEARN AND CHANGE YOUR WAYS OF **WORKING...**



REFLO'S LESSONS LEARNED

- · Forge diverse, multi-sector engagement, which can help smooth issues that arise when sharing limited funding.
- Develop strong communication with strategic partners and be willing to start small and grow.
- Provide consistent and varied opportunities (over several years) to engage new potential partners and stakeholders to lead on new fronts.
- <u>Document progress</u> for projects and the overall initiative, ideally visually and from multiple perspectives.
- · Set reasonable annual objectives and develop a multiphased annual process for project development.
- Get creative and involve students and communities at each phase of development.



PROGRAM BACKGROUND

To combat stormwater pollution due to combined sewer overflows in the combined sewer area, the Philadelphia Water Department (PWD) is investing primarily in green stormwater infrastructure (GSI) with complementary grey infrastructure improvements. This is an ambitious plan and a first of its kind for a large city. Green City, Clean Waters aims to manage stormwater throughout the city - on streets, parks, vacant lots, schoolyards, and other property - through a public capital program as well as on private properties via development regulations and stormwater incentive grants. The goal is to reduce stormwater pollution entering Philadelphia's local waterways by 85%.

Philadelphia has placed a significant emphasis on incorporating GSI on School District of Philadelphia (SDP) schoolyards, as they are the largest school land owner. GSI schoolyard projects can follow three different implementation pathways: stormwater regulations, stormwater

incentives, and PWD-led public retrofits. When SDP schoolyard capital projects trigger Philadelphia's stormwater regulations, SDP funds GSI as required to meet regulations. Stormwater retrofits are incentivized through PWD's Stormwater Grant program, which has awarded grants to the SDP and third party implementers such as the Trust for Public Land and community organizations working on behalf of SDP to implement GSI on schoolyards. To date, 13 SDP schoolyards have received this funding. GSI constructed to meet regulations or via grant funds must be owned and maintained by the property owner, in this case SDP. For the PWD-led public retrofits pathway, in which PWD builds projects directly on school property, the goal is for GSI to be owned and maintained by PWD. SDP and PWD are working towards a property interest agreement which would enable PWD to spend city capital funds to design, construct, and maintain GSI systems on SDP property.





PROGRAM PROFILE

ORIGIN:

Philadelphia's Green City, Clean Waters program is outlined in a Consent Order and Agreement.

SERVICE AREA:

The City of Philadelphia, with a population of 1,584,138. Green City, Clean Waters is being implemented in portions of Philadelphia served by a combined sewer system, which is approximately 60% of the city with sewer infrastructure, and the most dense, urban portion of the city. PWD serves 1.7 million drinking water and 2.2 million wastewater customers.

STRUCTURE:

PWD is a city agency; SDP has a voter-elected school board and is a public agency independent of the city.

SOLUTIONS IMPLEMENTED

►GAINING BUY-IN AND BUILDING PARTNERSHIPS

SDP's highest priorities are teaching and student learning, which are challenged by historic underfunding and complex factors, putting SDP in a position of meeting goals with less than ideal budgets and staff, including facility capital improvements. To support a successful long-term partnership with SDP, PWD has a manager dedicated to overseeing the work. The PWD partnership manager schedules regular meetings with SDP executive, management, maintenance, and education staff to continuously address risk, liability, design, and construction concerns as well as to provide maintenance guidance to ensure the success of the partnership and GSI on schoolyards. Advancing the understanding around risk and liability for GSI systems has been key in working towards a property interest agreement between SDP and PWD.

To further facilitate district-level buy-in for GSI on schoolyards, PWD has aligned itself with the SDP <u>Green Futures Sustainability Plan</u>, which includes <u>transforming schoolyards</u> as one of its five goals. To garner individual school interest, PWD has helped in building awareness and community demand for their program and connecting schools to each other to create a community of support.

SECURING FUNDING

For SDP capital projects that trigger stormwater regulations, funding is provided by SDP. Several GSI projects have been implemented in this way through the years; however, SDP has not had the full capacity and funding to provide the recommended level of maintenance for these and other sites. Recently, SDP has dedicated funding for a maintenance contract. In addition, the private William Penn Foundation is providing the district with funding towards maintenance staff as part of a larger grant in support of GSI.

For Stormwater Grant projects, which come from PWD operating funds, additional funding is invested either by SDP or other external funders to complete GSI schoolyard projects. These third-party implementers seek funding primarily for the non-GSI elements of schoolyard greening efforts via state and federal grants and local and national private foundations.

To further incentivize stormwater management, the William Penn Foundation will contribute funding for non-GSI elements, prorated based on the amount of stormwater managed within each grant-funded project and, potentially, PWD-led capital projects in the future. The goal of the foundation grant is to support and expand GSI on SDP schoolyards.



PWD has leveraged their stormwater grant funding to gain additional investment from various sources. For every dollar invested by PWD, a minimum of two dollars are invested toward a schoolyard transformation, either by SDP or by collective funds raised by non-profit partners like the Trust for Public Land, The Big Sandbox, or school-related "Friends of" groups.

Philadelphia is testing different approaches to funding non-GSI features, such as exploring incentive structures that encourage more flexible funding in exchange for stormwater capture beyond the schoolyard's footprint (e.g. from roofs or the street). As described above, one such effort is funded through the William Penn Foundation and would support schools paying for non-GSI features.

MAINTAINING GSI

Among the requirements of PWD's Consent Order and Agreement is the requirement that GSI be maintained for 45 years. For future projects installed by PWD on SDP property projects, the parties are continuing to finalize details of a property interest agreement to enable PWD to maintain GSI systems on SDP property.

The majority of GSI schoolyard projects have been implemented through stormwater regulation and stormwater grant pathways, and SDP is responsible for GSI maintenance for these sites. Per PWD policy, SDP is entitled to a reduction of their stormwater bill in return for implementing stormwater management measures. To be eligible for this bill reduction, however, SDP is required to sign and follow ownership and maintenance agreements with PWD.

PWD provided maintenance for SDP stormwater grant projects for the first two years after completion of each project. SDP has recently dedicated funding toward gaining capacity and undertaking its own GSI maintenance, so these schools are being transitioned to full SDP maintenance.

PWD also provided guidance to the district to build internal capacity and knowledge to draft an RFP for GSI maintenance on schoolyard projects regardless of whether they were initiated through stormwater regulations or grants. SDP is also developing internal processes, such as work order tracking, to ensure the long-term success of GSI projects. To further support this success, the William Penn Foundation has been willing to fund one or two SDP positions for up to four years to support management and process development for GSI maintenance.

PWD also advocates for school groups to take ownership of GSI stewardship. "Friends of" groups have helped develop ground rules and stewardship plans for their installation and some have formalized these with SDP. The Sustainable Business Network is providing professional development training for maintenance and has subsidized tuition of SDP employee attendance.



RESOURCES CREATED

Through a partnership between PWD, SDP, and the Community Design Collaborative, this design guide documents the process of Transforming Philadelphia's Schoolyards.

PWD's Stormwater Grant **Application Guide** provides a step-by-step guide for non-residential property owners, such as SDP or third party implementers, to apply funding for a GSI retrofit project

SDP has created a guide to starting a school-based site improvement project, which often involves stormwater management elements.

SDP's Office of Grant Development has created the Guide to Fundraising and Grantwriting for Schools, which is useful to the many fundraising efforts Philadelphia's public schools undertake to fund educational and capital improvement priorities, including schoolyard stormwater retrofit projects.

DUSING GSI FOR I FARNING

The Fairmount Water Works (FWW), a non-profit education arm of PWD, developed the <u>Understanding the</u> Urban Watershed Curriculum, which is geared toward middle school grades. FWW worked with SDP on curriculum development to align with all SDP requirements. Teachers were trained in outdoor instruction with the support of a three-year William Penn grant, and more funding sources are being pursued.

Twelve out of SPD's 220 schools are now designated as Community Schools through a program initiated by Philadelphia Mayor Jim Kenney and his Office of Education. The program aims to work with each school

community to identify pressing needs and bring resources directly into schools. One of those is the William Cramp Community School, a K-5 school that serves as the prototype for a green schoolyard approach, with the hope that green schoolyards will become a core program for all schools in the area. Where stormwater management meets a school community need, and is feasible, PWD's Stormwater Grant program could be a grant funding source for schoolyard GSI, thus leveraging the city's resources across several agencies.



PWD'S LESSONS LEARNED

ON PROGRAM ENGAGEMENT:

- Commit to partnership development through dedicated staff, a regular meeting schedule, and by leveraging GSI funding for additional investments.
- Build awareness and demand for your program through benefits and demonstrated alignment with the school district's goals.
- Develop educational opportunities for the installations.

ON IMPLEMENTATION:

- Provide technical assistance to all partners.
- Develop a consistent outreach process.
- Advocate for stewardship plans during design and implementation.

COMMIT TO PARTNERSHIP DEVELOPMENT **THROUGH** DEDICATED STAFF, A REGULAR **MEETING** SCHEDULE, AND BY LEVERAGING **GSI FUNDING** FOR ADDITIONAL INVESTMENTS.



PROGRAM BACKGROUND

San Francisco Public Utilities Commission (SFPUC) first started its partnership with the San Francisco Unified School District (SFUSD) in 2009 to work on stormwater capture on schoolyards. SFPUC was going to be fined by the US EPA for a spill, but instead negotiated that the fine be spent to start a green infrastructure grant program, called the Watershed Stewardship Grant Program. The initial project of the two agencies was Tap the Sky, which started as five schools doing rainwater harvesting and irrigation. They have since completed over 20 rainwater collection systems in San Francisco public schools and common spaces.

In 2010, SFPUC implemented the Stormwater Management Ordinance (SMO), which requires large, new, and redevelopment projects to manage stormwater onsite. As school renovations triggered SMO compliance, SFPUC provided technical assistance and guidance to SFUSD on a project-by-project basis.

In early 2019, the SFPUC launched its Green Infrastructure Grant Program to incentivize large landowners to retrofit their properties with green infrastructure to manage their stormwater onsite. This program is funded through SFPUC's capital budget and has a 20-year maintenance requirement. Projects will be able to receive \$765,000 per impervious acre managed, up to \$2 million per project. SFPUC currently has \$6.4 million available in funding for the first 2 years of the program. Prior to

program implementation, SFPUC and SFUSD partnered on a pilot project at SFUSD's R. L. Stevenson Elementary School. The project had a budget of \$1 million and was completed in 2018 (see full report here).

SFPUC and SFUSD committed to a robust planning and design process, allotting three years for planning, design, and construction. This process built interagency trust and provided a small scale pilot to learn and test a joint project delivery process. R.L. Stevenson had green schoolyard funding through SFUSD's bond program and the partners integrated GSI through disconnecting downspouts, installing dry creek beds that act as infiltration beds, and implementing a sunken amphitheater with permeable pavement. When issues arose, the agencies worked together to resolve them, and they developed honest relationships within and between organizations.

SFPUC already has several lessons learned through its work with SFUSD so far. First, it's important to leverage existing resources. For example, SFPUC is able to minimize costs by working on sites where SFUSD already has construction planned. Second, there is value in planning capital projects together to identify common priorities. SFUSD and SFPUC successfully collaborated together to identify the most suitable GSI sites within the district. The agencies also leveraged their own funding to allow each agency to accomplish their goals through a shared project budget. For



PROGRAM PROFILE

ORIGIN:

Compliance with EPA MS4 permit

SERVICE AREA:

The city and county of San Francisco has a population of 884,363 (as of 2017) and covers 46.87 square miles

STRUCTURE:

SFPUC Wastewater
Enterprise operates
and maintains the city's
sewer system. SFUSD
has voter-elected school
board members who
hire the superintendent.
School property is owned
separately from the City of
San Francisco.

R.L. Stevenson, SFPUC and SFUSD pooled their funds (at \$800,000 and \$200,000 respectively) for a shared project budget with each agency paying for their parts of the project.

Similar to Philadelphia's interests, SFPUC is currently in discussions with SFUSD on the feasibility of building SFPUC-owned assets on school property.

SOLUTIONS IMPLEMENTED

▶GAINING BUY-IN AND BUILDING PARTNERSHIPS

SFPUC and SFUSD spent years developing a relationship through small-scale grant projects and the SMO before the Stevenson pilot project was implemented. Their discussions focused on how GSI can improve schoolyards from SFUSD's perspective: adding visible infrastructure improvements, creating learning opportunities, offering signage, and creating multi-functional spaces. SFPUC demonstrated how these goals could be met with GSI through the use of images and precedent projects from other cities to help overcome and address SFUSD's concerns. Together, SFPUC and SFUSD have created a winwin with stormwater capture and education.

Even prior to the SMO there was a culture of greening schoolyards at SFUSD. In fact, over 90% of schools in the district have green schoolyard features. SFUSD even has a green schoolyards manager, a first in the U.S. This position is a main point of contact for SFPUC and for schools wanting to apply for SFPUC's stormwater grants.

SECURING FUNDING

On some projects, SFPUC funding augments SFUSD bond funding to maximize budgets and implement larger green schoolyard features. Non-GSI schoolyard elements are also funded by city grants, community challenge grants, grants from local non-profits, and San Francisco's Participatory Budgeting funds.

MAINTAINING GSI

There are several types of maintenance agreements that SFPUC uses for GSI, including the Green Infrastructure Grant Program and the SMO compliance projects. While SFUSD schools must commit to maintaining green schoolyard elements installed using district bond and other green schoolyard grant funds, SFUSD's landscape staff is responsible for maintaining green infrastructure elements, as they require specialized maintenance and attention. The green schoolyards manager is notified if something isn't performing or being maintained properly and works with the school and/or the landscape department to solve such issues.



Stormwater management areas installed by SFUSD as part of the SMO are maintained by SFUSD landscape department and operations and maintenance staff. During design and construction of these projects, operations and maintenance staff are involved so that maintenance and ongoing sustainability are considered throughout the process. This SFUSD design review working group ensures that the proposed stormwater elements are in the best interest of the district in the long term. SFPUC also provides maintenance training to SFUSD landscape staff.

►USING GSI FOR LEARNING

Written in 2009, The Watershed
Stewardship Curriculum was
designed to teach children lessons
pertaining to watershed awareness,
green stormwater management,
pollution awareness and prevention,
and water conservation. Lessons
within this curriculum can be adapted
for kindergarten through 6th grade
and beyond.



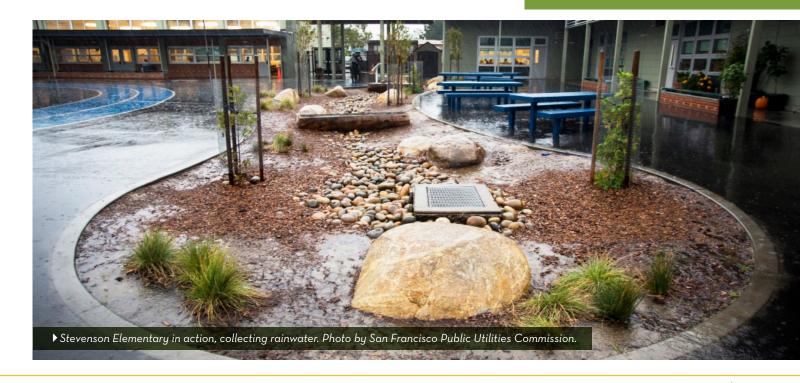
RESOURCES CREATED

Many materials have been created as part of this work and are embedded in the case study above. Several additional presentations on the topic include:

CASQA Stormwater Schoolyards (PPT)

- recent conference presentation on R. L. Stevenson and the partnership

Swimming Upstream
(PPT) - recent SFPUC
and SFUSD conference
presentation





SFPUC'S LESSONS LEARNED

- Look for efficiencies. After the first few years of funding GSI throughout the Watershed Stewardship Grant Program, SFPUC determined that they were spending too much time on project management for small projects that did not yield significant stormwater benefits. The agency is now moving toward funding larger projects to get the most stormwater capture with the same amount of project management.
- Spend time building trust between project partners. It is essential to make sure that all partners understand each other's motivations and concerns.
- Discuss and identify funding for maintenance prior to initiating a project. School districts have very limited resources to address facilities maintenance. Utilizing partners can promote creative maintenance solutions that have multiple benefits.
- Create a database of materials and document successes and challenges, which will help with future projects. Since so many materials are new, this can help track what's working and what's not on heavily used public school sites across the country and around the world.
- Have school districts think through possible future uses of any given space on a schoolyard before selecting a site for GSI.
- Start small. It's okay to have a long term goal, but start small so that you can develop relationships, understand partner needs, create processes, etc.

SPEND TIME BUILDING TRUST BETWEEN PROJECT PARTNERS. IT IS ESSENTIAL TO MAKE SURE THAT **ALL PARTNERS UNDERSTAND EACH OTHER'S MOTIVATIONS** AND CONCERNS.



PROGRAM BACKGROUND

In Washtenaw County, MI, the Water Resources Commissioner's Office works to reduce flooding and improve water quality in the county. To that end, Washtenaw County's schoolyard rain garden program started in 2014 after its staff members attended a water quality education training. Washtenaw had an existing private property rain garden program throughout the county, but the staff were inspired to work with schools because they wanted a larger footprint for outreach and education. Since then, the program has expanded to 15 schools in Ann Arbor, Dexter, and Ypsilanti, MI. The County Water Resources Commissioner's Office works with local school districts on a site-by-site basis to approve the rain garden location, building plan, and maintenance process.

Once a school is identified and committed, program staff from the County Water Resources Commissioner's Office leads two or three classroom visits where they dive into rain gardens as solutions to stormwater issues and work on rain garden design with the students. Concurrently, a team of parents, teachers, and master rain gardeners (MRGs) get permission for the placement of the rain garden from maintenance staff, with the goal of choosing an easily accessible, usable location with water access.

If needed, the County oversees the heavier construction of the rain garden. Students, parents, and other local volunteers install the majority of the rain garden in one to two afternoons or weekend workdays. This includes planting and mulching with the students. The final lesson includes creating a rain garden and plant fact sheet to be used for inschool education after installation.

Ypsilanti Community Schools (YCS), one of the three districts that the Water Resources Commissioner's Office works with, installed its first rain garden in 2017. After Washtenaw County led the engagement and installation of the project, the YCS part-time school garden coordinator took the reins. The garden coordinator is now helping a garden club maintain the rain garden and interpretive signage. In the summer of 2019, the garden coordinator will help maintain YCS rain gardens with the help of MRGs. The garden coordinator-whose role is to support garden-based education with lessons. classroom management training, supplies, and support of garden clubs with special projects at as many schools as possible in YCS-was initially funded through a grant gifted by the local nonprofit Growing Hope, but is now funded through YCS.



PROGRAM PROFILE

ORIGIN:

Teachers requested help with puddles on their playgrounds and had a strong interest in rain gardens as teaching tools.

SERVICE AREA:

Washtenaw County is 722 square miles and has a population of 367,627. Washtenaw County has worked with schools in Ann Arbor (population 121,477), Dexter (population 4,469), and Ypsilanti (population 21,076).

STRUCTURE:

Washtenaw County school districts are independently operated outside of the county jurisdiction.

SOLUTIONS IMPLEMENTED

►GAINING BUY-IN AND BUILDING PARTNERSHIPS

The Washtenaw County Water Resources Commissioner's Office engages the director of facilities for each district with which they work. The directors usually help coordinate rain garden planning and are generally communicative and helpful. Often, rain gardens are helping solve site-specific issues such as puddling and erosion, providing a direct benefit for the school district.

YCS is committed to supporting their rain gardens as long as they are maintained and don't interfere with lawn mowing routines. Washtenaw County consults with the Facilities Department to identify location suggestions. Administration buy-in at the district and school level relies on on-going student engagement and the rain gardens serving as learning tools. YCS supports a garden coordinator and outdoor learning because of the student benefits that they witness. Student engagement through design, classroom learning, and after-school programs, makes the investment worth it. Without these components, YCS might not fund the supporting staff position.

SECURING FUNDING

Rain garden funding has primarily come through grants, such as the National Science Foundation and the Community Foundation of Southeast Michigan. These grants cover shared tools and replanting costs for all of the rain gardens in Washtenaw County. Some schools have their own funding to support installations, too. Meeting MS4 permit requirements for public education, public involvement, and using best management practices to protect water quality is in part how Washtenaw County justifies funding its staff time.

▶MAINTAINING GSI

One of the most interesting aspects of the Washtenaw County GSI program is the development and implementation of a Master Rain Gardeners program. Modeled after the Master Gardener program, it includes a shorter online and inperson training component. The certification part of the program includes building your own rain garden or adopting a school or public rain garden. Michigan State University Extension first housed the program, and now Washtenaw County has taken it over.



The Washtenaw County school rain gardens are usually 400 square feet and easily weeded by hand. MRGs are recruited early in the planning process so that they are engaged with the school team. Once the rain garden is installed, MRGs help with initial maintenance (mostly watering) for the first year. In years two and beyond, they visit two to three times per year for general weeding or replanting, ideally coordinating with a larger group at the school. If MRGs aren't able to keep up with school rain garden needs, Washtenaw County staff and interns lead the maintenance.

DUSING GSI FOR I FARNING

The Southeast Michigan Stewardship Coalition (SEMIS) works with teachers across southeast Michigan to support place-based education. They help train teachers, cover costs for substitute teachers to allow teachers to take time for the training, and work with university researchers for STEM learning. Washtenaw County partners with the SEMIS coalition to support teacher use of the schoolyard rain gardens.



RESOURCES CREATED

Guidebook to Schoolyard Rain Gardens

Schoolyard Rain Gardens webpage of Washtenaw County Water Resources Commissioner's Office. The webpage includes a guidebook, lessons, maintenance, and planning process documents.





WASHTENAW COUNTY'S LESSONS LEARNED

- Plan for the long haul. You can never walk away from a schoolyard rain garden. Some years they are less work, and some years they are more.
- Maintain steady engagement through a dedicated staff person who can maintain continuity through staff turnovers. Ask yourself, "How are students going to continue to be involved beyond installation?" Continued involvement will make the projects most sustainable. If the students are excited about it, they can get their teachers and families excited about it. too.
- Use your rain garden to promote understanding of environmental benefits, such as improved wildlife habitat. Get outside support to help teaching staff feel comfortable teaching outdoors and keep teachers and students engaged with the rain garden.
- Look for overlapping support from different programs (such as school, public, and private rain gardens) to help ease the needs of each program. Sharing training and tools and culling plantings from overgrown public rain gardens to supplement planting at school rain gardens can help stretch resources.
- Engage the community to help use and celebrate the schoolyard spaces and to help weather the inevitable family and staff transitions.

ENGAGE THE COMMUNITY TO HELP USE AND CELEBRATE THE SCHOOLYARD SPACES AND TO HELP WEATHER THE INEVITABLE **FAMILY AND STAFF** TRANSITIONS.



CITATIONS

RESOURCES CITED

(in order of appearance)

BARRIERS & SOLUTIONS

Space to Grow: Greening Chicago Schoolyards. Webpage. Link: https://www.spacetogrowchicago.org/

Green Schoolyards Resource Hub. Children & Nature Network. Webpage. Link: https://www.childrenandnature.org/initiatives/schoolyards/hub/

Green Infrastructure Building Materials Guidelines. Omaha Public Schools. PDF. Link: https://drive.google.com/file/d/12eD-F8xGzztuQgvcQ3QuTMV39vgWuBqi/view?usp=sharing

School Ground Planning & Design. Evergreen, Website. Link: https://www.evergreen.ca/our-projects/planning-design/

Green Infrastructure Building Materials Guidelines. Omaha Public Schools. PDF. Link: https://drive.google.com/file/d/12eD-F8xGzztuQgvcQ3QuTMV39vgWuBqi/view?usp=sharing

Stormwater and Green Infrastructure Curriculum for Boston Public Schools and appendices. Kristin Metz and Anne Kitchell. PDFs. Link: https://drive. google.com/open?id=1fpC6ptpQV1FUWiOPurMSTxYkcCOPaSkI

Elementary School Lesson Plans. City of Omaha's Stormwater Program. PDF. Link: https://drive.google.com/file/d/12oC1ZVv42izDwhwUkh5gTltMkItAuANF/ view?usp=sharing

Middle School Lesson Plans. City of Omaha's Stormwater Program. PDF. Link: https://drive.google.com/file/d/14JGI4cKP-tI6ROvy2s4xTT-PLFHMTYFK/ view?usp=sharing

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Boston Schoolyard Initiative. Webpage. Link: http://www.schoolyards.org/

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New York City Playgrounds. Trust for Public Land. Wepage. Link: https://www. tpl.org/our-work/new-york-city-playgrounds#sm.0001yzdoyuafqdz7w9s1darlpem ch

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RainScapes for Schools. Montgomery County Maryland's Department of Environmental Protection. PDF. Link: https://drive.google.com/file/ d/12wy7904CpwLDZ_vTUi5yuIPV5RePIOS5/view?usp=sharing

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Conceptual Schoolyard Redevelopment Planning Grant Description. Green Schools Consortium of Milwaukee. PDF. Link: https://drive.google.com/file/d/OB 25qcqd3NmDEeUFfaXktYkQoSEE5UmZlSVNwZoE3Z1VxME1J/view

Consultant Agreement G98002P03 Increasing the Milwaukee Area's Capacity for Green Schools. Milwaukee Metropolitan Sewerage District. PDF. Link: https://drive.google.com/file/d/oB25qcqd3NmDEWDRjTVNQa2VrVWlkQUtSe ExHNEhPRWFoa2VR/view?usp=sharing



Green Infrastructure Funding Agreement Template. Milwaukee Metropolitan Sewerage District. PDF. Link: https://drive.google.com/file/d/OB25qcqd3NmDEe TRraWdOU20zZDg3LVd2b105WjlpVVNfdEko/view?usp=sharing

Green Infrastructure Maintenance Analysis and Lessons Learned for Municipalities. Milwaukee Metropolitan Sewerage District. PDF. Link: https://drive.google.com/file/d/OB25qcqd3NmDEdURJbHhqTGRoamVod VFiUmxaMmUwUVIXT1BN/view?usp=sharing

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Green Futures. School District of Philadelphia. Webpage. Link: https://www. philasd.org/greenfutures/

GreenScapes. School District of Philadelphia. Webpage. Link: https://www. philasd.org/greenfutures/focus-areas/school-greenscapes/

Understanding the Watershed. Fairmont Water Works. Webpage. Link: https:// www.resourcewater.org/

Case Study: Philadelphia Community Schools Nature Habitat Gardens. Children & Nature Network. PDF. Link: https://www.childrenandnature.org/wpcontent/uploads/Case-Study-Philadelphia-Community-Schools.pdf

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Stormwater Grants Application Guide. Philadelphia Water Department. PDF. Link: https://www.phila.gov/water/wu/Stormwater%20Grant%20Resources/ StormwaterGrantsManual.pdf



How to Start Your School-Based Site Improvement Project. The School District of Philadelphia. PDF. Link: https://www.philasd.org/capitalprograms/wpcontent/uploads/sites/18/2018/09/OCP-Review-Path-Final.pdf

Guide to Fundraising and Grant Writing for Schools. The School District of Philadelphia. PDF. Link: https://www.philasd.org/grants/wp-content/uploads/ sites/61/2017/07/fundraising guide sdp14 c.pdf

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San Francisco's Stormwater Schoolyards. San Francisco Public Utilities Commission. Webpage. Link: https://sfwater.org/index.aspx?page=1263

Robert Louis Stevenson Stormwater Schoolyard: Improving Our Sewer System and Benefiting the Community. San Francisco Public Utilities Commission. PDF. Link: https://sfwater.org/modules/showdocument.aspx?documentid=13181

Stormwater Schoolyard Planning Process for R. L. Stevenson Elementary School. San Francisco Public Utilities Commission. Link: https://sfwater.org/modules/ showdocument.aspx?documentid=13183

Case Study: Education Outside San Francisco, CA. Children & Nature Network. PDF. Link: https://www.childrenandnature.org/wp-content/uploads/Case-Study-Education-Outside.pdf

Stormwater Management Agreement. San Francisco Public Utilities Commission. Word Document. Link: https://drive.google.com/file/d/1kzjP-7g3eEihVVtt-6YKEA-Oij-yVY7i/view?ts=5d8e3455

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