



# GREEN INFRASTRUCTURE

*Engagement and Buy-In Toolkit for your  
Schoolyard's Green Infrastructure*





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## Green Infrastructure 101

As our population grows, natural landscapes are replaced with urban areas, developed with concrete, buildings and driveways. When it rains, rainwater falls onto hard surfaces, such as concrete and pavement. Where there used to be natural landscapes that could absorb water, there are now impermeable surfaces that cause stormwater to runoff, which picks up pollutants, chemicals and debris as it flows over the land surfaces, eventually draining into our rivers, lakes and drinking water sources.

**Green Infrastructure (GI)** is a way to use nature (soil and plants) to capture, slow down and filter rainwater runoff, even in urban and developed areas of our community. The result is cleaner, healthier water, for humans and for animals.

Dear OPS Faculty and Staff,

The purpose of this Green Infrastructure Toolkit is to provide Omaha Public Schools (OPS) with a go-to guide that will help you foster community support for the stormwater best practices that have been and/or will be installed in your schoolyards.

Since 2010, the Green Schools Initiative has helped OPS create a culture of environmental responsibility. All of the District's schools, programs and administrative offices participate. The new addition to the Green Schools Initiative is the Schoolyard Scorecard, which measures and inspires the positive environmental changes and on-going efforts in our schools' outdoor spaces.

This toolkit will assist you in creating buy-in from neighbors and the greater Omaha community for the schoolyard features that may seem a bit "different," but have a positive environmental, social and learning impact on both the students and the neighborhood.

Schoolhouse Planning will oversee the creation of your project. You can use this Green Infrastructure Toolkit to create and implement projects for students, provide information and messages to the community and to answer questions about why your schoolyard is intentionally designed and maintained in a way that promotes student learning, protects the Missouri River and Papillion Creek, and reduces flooding in the surrounding neighborhood.

Thank you for your contributions to this endeavor, and best wishes for successful enjoyment in your respective projects.

Sincerely,



Antoinette E. Turnquist, Ed.D.  
Chief Operations Officer  
Omaha Public Schools



**Green Infrastructure** is an environmentally friendly way to manage stormwater so that we prevent pollution, flooding and erosion. A rain barrel is a popular GI tool. The barrel is placed under a downspout and collects rainwater.

This GI practice, called **rain harvesting**, controls the water (and pollutants) draining into our creeks. It's also an alternative to tap water when it's time to water gardens.



# Why OPS ♥'s Green Infrastructure

In cities, like Omaha, buildings, pavement and other hard surfaces prevent rain and snow from soaking into the ground. Instead, this water runs off, often flowing directly to streams, rivers and other water bodies. This runoff can carry pollutants like oil, chemicals, pet waste and lawn fertilizers. The quantity and speed of flow can also cause erosion, flooding and damage to aquatic habitat, property and infrastructure.

Green infrastructure (GI) is a way to managing stormwater near where it falls to prevent pollution, flooding and erosion. Most GI uses nature (soil and plants) to capture, slow down and filter runoff.

- ✓ SMALL SCALE GI  
at home with a rain barrel
- ✓ NEIGHBORHOOD SCALE GI  
a green streets project
- ✓ LARGE SCALE GI  
a city-wide urban tree planting project

So, why does OPS ♥ Green Infrastructure?

## COST SAVINGS

The City of Omaha needs to upgrade the existing stormwater infrastructure (gutters, stormdrains, etc), and OPS needs to update schools and build new schools. GI is often less expensive than traditional stormwater infrastructure because it uses less cement, and maintenance costs less over time.

## EDUCATIONAL VALUE

GI on school grounds will provide a multitude of learning experiences for students while making the schoolyard a beautiful place for students, teachers, staff and neighbors.

The opportunities to use the GI in your schoolyard are limitless. All subjects can use outdoor elements to explore a concept or demonstrate a competency. Use the GI at your school as a learning tool. Try one new lesson outdoors each year and discover how engaged students can be when nature is the learning laboratory.

### School lessons are boundless with GI!

- discover shapes
- categorize colors
- label plant parts
- observe insects
- calculate runoff

- track a biodiversity index
- create art
- write poetry
- run/walk/jump
- plot plant types on GIS

- determine area
- research local government water policies
- explore Native American medicinal plants

# One Project. Countless Benefits.

## ENVIRONMENTAL BENEFITS

*GI not only cleans up the Missouri River and Papillion Creek, but also has positive impacts in your neighborhood*

- ♥ Reduced flooding, pollution and erosion
- ♥ Recharging groundwater supplies
- ♥ Increases wildlife habitat

## ECONOMIC BENEFITS

*Who doesn't want to live and work in a city with less pavement and more trees, flowers and greenspace?*

- ♥ Increases property value
- ♥ Attracts residents and commercial investment
- ♥ Encourages redevelopment

## SOCIAL BENEFITS

*GI projects give cities something unique and special, and help create a sense of place*

- ♥ Increases recreational opportunities to improve health
- ♥ Experiences in nature can reduce stress
- ♥ Increases community pride



**Permeable pavement** is a GI practice that utilizes multiple sublayers of pavement to capture, store and infiltrate stormwater runoff to subsoil. Permeable pavement is ideal for cold weather climates. Precipitation can drain to sublayers and expand, which prevents surface refreezing and icy roads.



*“The Northwest High School rain garden allows students to utilize their STEAM skills and their 21st Century skills to design a structure that will better their community and environment.”* - Rachael A. Burns M.S., Anatomy & Physiology, Plants & Propagation, Horticulture & Landscaping, Northwest Magnet High School

# Northwest High School **BUILT** the Gardens on their Schoolground

When we say “Northwest High School students built the gardens” on their schoolground, we mean that they surveyed, calculated and designed the garden layout; produced conceptual designs; oversaw construction; and even promoted the garden to the community. From start to finish these students used their classroom knowledge for a real-world project... and they are not stopping there!

The gardens at Northwest Magnet High School collect rainwater runoff while providing a pollinator habitat, and examples of native fruits, forest and medicinal plants. The schoolgrounds will be a hands-on, outdoor learning and classroom space for students for years to come.

Students also made career connections working with local environmental professionals and the University of Nebraska Omaha on this project. The project highlights environmental sustainability and STEAM concepts (Science, Technology, Engineering, Art and Math).



A **rain garden**, like the one built at Northwest, can be beautiful as well as functional. Rain gardens are versatile features that can be installed in almost any unpaved space. They are shallow, vegetated basins that collect and absorb runoff from rooftops, sidewalks, and streets.

This practice mimics natural hydrology by infiltrating, and evaporating and transpiring or “evapotranspiring” stormwater runoff.



## Get Your Community to GI

Sometimes GI looks a little different than traditional stormwater curbs and gutters and mowed-short landscapes. It may take some outreach to the neighborhood around your school to help them understand how great the GI is for your students, the community and the planet. Students can reach out to the neighborhood with fliers, signage, brochures and schoolyard tours to get the community buy-in to the GI.

### Schoolyard Signage

Have students create signs that can be posted throughout the schoolyard that talk about the GI elements and why they are important. Students can research, write, design, draw and calculate impacts to include in the signage. Signs can be replaced or revised annually.

#### Signage Theme Examples

Native Meadow Prairie in Progress; Butterfly Habitat Here; Pollinator Paradise

Rain Garden or Bioswale A Ditch that Cleans Water; Super Sponge; Fabulous Filter; Parking Lot Pollution Stopper; Designed with Water in Mind (yes, a sign about math and art elements used to create the bioswale would be informative and show-off your students' genius)

Rain Harvesting Harvest Water-Save Money (this could be a promotion for parents to rain harvest at home)

Pervious Concrete You're Parking on Our Sponge; When it Rains it Drains

There are lots of examples out on the web of great signs with messages you can use for your school's signage. But, the best messages may come from the students themselves.

### Neighborhood Fliers

Most people do not like change. So, if the neighborhood school puts something in that looks different there will be questions, concerns and commentary. Head off the apprehension at the pass by having students create fliers about the new GI elements and deliver them to the neighbors. Include what it is and why it's there. Have students create messages and art work to go in the flier. Is there a local business that would like to come in to help design and print the fliers? Be sure to highlight how that GI element is going to help students learn and make the schoolyard a better place. If it has benefits to students and the neighborhood, like reduced flooding and pollution prevention, it will be difficult to argue with.

If the GI has been around a while, give seasonal updates. Have students count numbers of species or number of pollinators and send out a flier about those numbers, how they are growing and what that means for the overall health of the community.

- Bees are responsible for 1 in every 3 bites of food
- Diverse plant communities make the landscape more resilient to drought and disease



## Connect to Omaha

### City Channel Messages

Incorporate technology and media into the GI messaging efforts. Have students write stories about their outdoor lessons and read them for the city channel while pictures scroll. Or, have students make videos about what they are learning outdoors, how they are using their schoolyards as a laboratory or produce infomercials about how to use GI at home or at a business.

### Local Media

Show off your students and your schoolyards often. Send out press releases on a regular basis to local newspapers, radio and television stations. In the press release, incorporate messages that inform the audience why GI projects are important for the school and the community. Tell stories that are specific, and have clear take-away messages. General stories are not as engaging as stories about a specific person or subject. Tell a story about one student's love for insects because of the pollinator count they did in the school's native prairie, or how a math class is calculating how much runoff is avoided with the GI in their schoolyard and how that helps the neighborhood avoid flooding. The more personal and specific the more support you can get from your audience. Be sure to put out press releases each time a local parent group or nonprofit volunteers their time to help.



## Connect to the World

### Social Media

There are so many great ways to use social media to show-and-tell OPS employees, students, parents, the community and the world about the cutting edge, sustainability work that Omaha is doing at their schools. Use all platforms, including, but not limited to Facebook, Twitter, Instagram, blogs, etc.

- Create a schoolyard GI hashtag and use it for any post or message about OPS GI. With this hashtag parents, students and the community can also take pictures and post great things about OPS GI projects that can be tracked and reposted.
- Handover a camera to a student or classroom for a week to provide Instagram photos with captions, or tweets about the GI elements or the projects they are working on in their schoolyards.
- Set themes and have students come up with posts about their school yard. Themes could be about pollinators, biodiversity, letters or numbers in nature, colors in nature, water cycle.
- Let kids create short videos about different GI topics to edit and post to YouTube. Share these videos on the school's social media sites. If you get enough videos, you can create your own playlists and channels for other communities interested in learning about sustainable schools.
- Let your class create a blog on their tips to the community for GI success.
- Have students create academic twitter accounts, and give them quick homework assignments such as posting a picture of their schoolyard or retweeting an interesting green GI article. You can even have competitions to see whose account can get the most relative followers!
- Pinterest can be a visual learning board for students. Create scenarios such as "What would perfect green infrastructure look like at our school?" Let them pin different images, articles and ideas to get inspired about DIY GI!

### Awards and Recognition

OPS is a leader in incorporating GI into their schoolyard design and engaging students with professionals on real-world projects. Do not let the opportunity pass to be recognized for your innovations and jobs well done. Apply for awards and grant opportunities when possible. Often, this type of recognition opens doors to other partnerships, funding and projects.



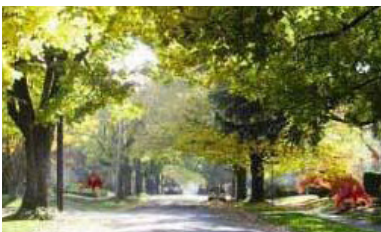
# Volunteers

It takes a little bit of effort from volunteers to keep our school's GI looking its best so that our students can get the most of out their schoolyard. Establish a volunteer team from the community to assist the school with GI upkeep.

Find a volunteer coordinator. This could be a teacher, a parent or a community member. Their role is to gather and coordinate the volunteers when needed, even through the summer.

## The Volunteer Coordinator

- Clearly identifies the jobs that need to be done
- Allows flexible work times
- Coordinates with maintenance staff
- Makes tools available or advise volunteers what tools they need to bring with them. (sunscreen, gloves, shovels, garbage bags, etc)
- Makes sure the jobs are small, doable jobs.
- Makes sure all volunteers sign liability releases



**Urban Canopy**  
Trees reduce and slow stormwater by intercepting precipitation in their leaves and branches.

City trees, or tree canopy, soak up stormwater, provide cooling shade and help to slow traffic.

## Potential Community Volunteers



Extension Mater Gardeners



Parents



Neighbors



Alumni



Business Green Teams



Young Professional Organizations



College Students

## Rain in the City Lingo

### Rain

*the water that falls from the sky (falling water also comes in the form of snow, hail and ice)*

### Runoff

*once the rain hits the ground anything that does not soak in is runoff*

### Stormwater

*the runoff that needs to be managed by city infrastructure to avoid flooding, property damage, and erosion*

### Green

*environmentally friendly, nature friendly*

### Infrastructure

*the basic structures (buildings, roads, storm drains, power lines, water system, etc) needed for the operation of a society*

### Green Infrastructure

*using soils, plants and land features to mimic natural processes to slow, sink and spread stormwater where it falls to avoid flooding, pollution and erosion*

## Additional Resources

American Society of Landscape Architects <https://www.asla.org/contentDetail.aspx?id=27316>

EPA Green Infrastructure <https://www.epa.gov/green-infrastructure>

Omaha Stormwater <http://www.omahastormwater.org/>

University of Nebraska Lincoln <http://water.unl.edu/stormwater/stormwater-education-for-kids>

Learn more about OPS Green Infrastructure at <http://bit.ly/OPSGI>



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Environmental Finance Center



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