

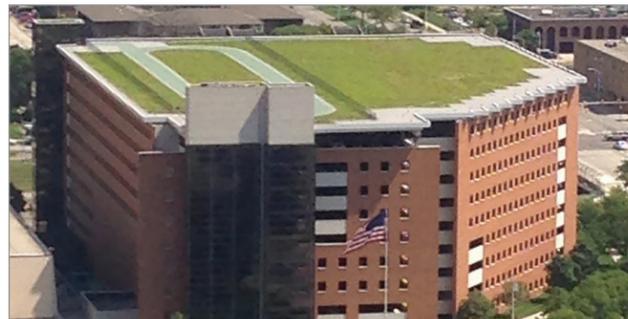


Bioretention and Rain Gardens

- ◆ Improve property and neighborhood aesthetics
- ◆ Reduce local flooding
- ◆ Promote infiltration and groundwater recharge
- ◆ Enhance pedestrian safety when used in traffic calming applications

Cisterns

- ◆ Reduce water consumption and associated costs
- ◆ Reduce demand for potable water
- ◆ Increase available water supply for other uses
- ◆ Can significantly reduce stormwater discharges from rooftops with larger cisterns



Green Roofs

- ◆ Have a longer lifespan than traditional roofs
- ◆ Reduce building energy costs through the presence of plants that reduce adsorbed solar radiation
- ◆ On buildings can command rental premiums
- ◆ Incorporate vegetation that provides habitat for wildlife

Permeable Pavements

- ◆ Allow conversion of typical pavement (e.g., parking lots) to pervious area
- ◆ Reduce stormwater runoff and standing water
- ◆ Promote infiltration and groundwater recharge
- ◆ Improve the longevity of infrastructure



Trees and Vegetation

- ◆ Intercept and adsorb rainfall
- ◆ Provide shade and reduce urban heat island effect
- ◆ Improve wildlife habitat and aesthetic value
- ◆ Reduce greenhouse gases by adsorbing CO₂
- ◆ Capture urban air pollutants (dust, O₃, CO)

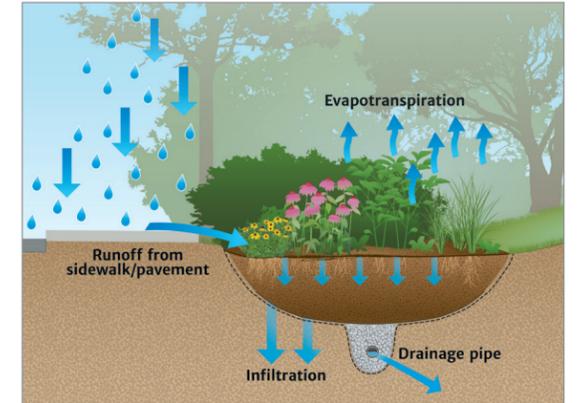
Green Spaces

- ◆ Increase soil porosity
- ◆ Reduces stormwater runoff volume
- ◆ Reduces peak stormwater flows
- ◆ Helps reduce the risk of flooding

BENEFITS of Green Stormwater Infrastructure

What is Green Stormwater Infrastructure?

Green stormwater infrastructure (GSI) diverts runoff of rain and snowmelt from the sewer system while providing environmental, social, and economic benefits. In Detroit, green stormwater infrastructure refers to the engineered stormwater practices used to mimic nature using vegetation, soils, and natural processes at a variety of scales, from single lot to neighborhood to watershed. These practices help to maintain and restore natural hydrology by infiltrating, evapotranspiring, capturing, or using stormwater. Common practices at a single lot scale can include rain gardens, bioswales, permeable pavement, infiltration systems and water reuse systems. Larger scale practices can include such amenities as ponds and wetlands.



Stormwater runoff flows into the bioretention

In addition to reducing the amount of polluted stormwater runoff, GSI practices can positively impact quality of life, public health, energy consumption, property prices, recreation and increase resiliency and protect the Great Lakes watershed.

Why Install GSI Practices?

Property owners that choose to install GSI can generate a variety of benefits. GSI practices installed by property owners reduce stormwater discharges to the City's sewer system, which results in fewer overflows of untreated sewage entering the Detroit and Rouge Rivers, helping to keep local waterways and the Great Lakes clean for recreation and drinking water. GSI practices also help to create improved habitat for local wildlife, including the City's important migratory birds, and improve urban biodiversity. GSI can bring numerous benefits to a community, including traffic calming, crime reduction, urban heat reduction, and increased health and well-being, as well as civic pride.

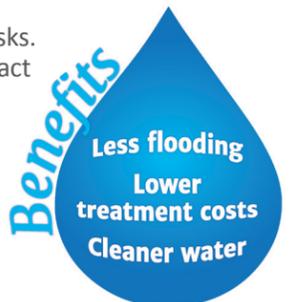


View of the City of Detroit from the Detroit River

Economic benefits include the reduction of a property's drainage charge by installing GSI practices or reducing impervious cover to generate a drainage charge credit. These practices can also help to alleviate basement back-ups and localized flooding, reducing property damage and public safety risks. Widespread installation of GSI practices throughout Detroit can also have a positive economic impact by reducing the city's need to further invest in expensive wastewater treatment facilities, which helps to keep drainage and sewer rates from significantly increasing.

Which GSI practices are associated with different types of benefits?

The next two pages describe the major benefits of installing green stormwater infrastructure and the types of GSI that provide that type of benefit.



GSI for Water Quantity and Quality Benefits

- Reduce stormwater runoff into combined sewer system
- Reduce standing water and localized flooding
- Promote infiltration and groundwater recharge
- Conserve water by recycling and using captured rainwater, or by using native plants that reduce the need for irrigation

GSI for Habitat and Wildlife Benefits

- Increase wildlife viewing opportunities
- Provide a variety of vegetation
- Provide shade and nesting opportunities
- Contribute to improving urban biodiversity

GSI for Community Benefits

- Improve property and neighborhood aesthetics
- Enhance pedestrian safety (traffic calming)
- Reduce urban heat island effect
- Provide shade in summer and block wind in winter
- Reduce noise

GSI for Educational Benefits

- Demonstrate stormwater management techniques to students and community members
- Involve students and community members in stormwater management
- Explore with students and community members differences between traditional development approaches and green-minded approaches
- Improve property and neighborhood aesthetics
- Change the way students and residents think about using the landscape
- Promote the idea of stormwater as a resource rather than a waste
- Highlight stormwater management as a potential career opportunity

GSI for Economic Benefits

- Reduce the drainage charge applied to properties through credits or reduced impervious cover
- Reduce cost to build storm drain infrastructure
- Reduce energy needed to transport and treat wastewater and drinking water
- Green infrastructure that includes attractive vegetation can improve property aesthetics, which can translate into increased property values.
- Reduce property damage from flooding
- Make neighborhoods healthier and safer
- Reduce household energy use



Cisterns



Permeable Pavements



Bioretention and Rain Gardens



Trees planted in a curb bump-out

GSI Practice	Water Quantity and Quality Benefits	Habitat and Wildlife Benefits	Community Benefits	Educational Benefits	Economic Benefits
Bioretention and Rain Gardens	💧	💧	💧	💧	💧
Cisterns	💧			💧	💧
Green Roofs	💧	💧	💧	💧	💧
Permeable Pavements	💧			💧	💧
Trees and Green Space	💧	💧	💧	💧	💧
Remove Impervious Cover	💧				💧



Impervious Cover Removal
(Credit: Eric Rosewall - Depave.org)



Educational Rain Garden



Green Spaces (Credit: DDOT Urban Forestry)



Bioretention

Additional Resources

- Center for Neighborhood Technologies (CNT). 2011. The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental and Social Benefits. <http://www.cnt.org/publications/the-value-of-green-infrastructure-a-guide-to-recognizing-its-economic-environmental-and-social-benefits>
- EPA. Undated. Benefits of Green Infrastructure website. <https://www.epa.gov/green-infrastructure/benefits-green-infrastructure>
- New York City. Undated. NYC Green Infrastructure Co-Benefits Calculator. <http://www.nycgicobenefits.net/>
- SEMCOG. Undated. Green Infrastructure website. <https://www.semco.org/Green-Infrastructure>