Well maintained and designed green infrastructure gives the appearance of a well-cared for and watched over property/area. This can lead to increased safety, savings in insurance, and avoided costs associated with burglary and vandalism.

**Bioretention** (see details at right)

- mixed soil for infiltration
- overflow pipe and drain
- curb cut for parking lot runoff
- decorative hardscape
- gravel bed

Attractive landscaping along urban business districts can lead customers to spend more on products, visit more frequently, and travel further to shop. In areas with mature tree canopy, customers indicate a willingness to pay 8 to 10% more to shop in an area with a more park-like setting.

Landscaping can add approximately 7% to average rental rates for office buildings. Office workers with a view of nature can lead to improved health, job satisfaction, and reduced stress and turnover.

Studies have shown that landscaping and trees increase residential property value by 2 to 5%. GSI provides healthy habitat for pollinators needed for healthy food production.

US Forest Service models show modest energy savings in the Midwest of approximately $45/year in reduced cooling costs in summer and heating costs in winter per tree.

Reducing the volume of stormwater runoff can lessen the frequency and severity of flooding.

These greening efforts can be especially effective when multiple property owners, as in a Business Improvement District, work together to improve a retail corridor.

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**BRIDGING HIGH & LOW DENSITY NEIGHBORHOODS WITH GREEN STORMWATER INFRASTRUCTURE:**

**SHARED PRACTICES THAT REDUCE BILLS AND BUILD COMMUNITIES**

Led by the Detroit Collaborative Design Center

**Project Team:**
- Great Lakes Environmental Law Center
- livingLAB
- OHM Advisors
- Zachary & Associates, Inc.
- Erma Leaphart
- Fai Foen
- Brightmoor Artisans Collective
- Grandmont Rosedale Development Corporation
- Southwest Detroit Business Association

**Made possible by the Ford Foundation**

March 2018
PROLOGUE
GREEN STORMWATER INFRASTRUCTURE IN DETROIT

The drainage charge administered by the Detroit Water & Sewerage Department (DWSD) pays for the infrastructure to manage and treat stormwater that enters the city’s combined sewer overflow system. The DWSD webpage states the following:

“Federal and State regulations required DWSD to invest more than $1 billion in combined sewer overflow control (CSO) facilities to help prevent untreated overflows into the Detroit and Rouge rivers and preserve Detroit’s water quality. The drainage charge recovers the cost for operating Detroit’s CSO facilities and treating wet weather flows at the wastewater treatment plant – more than $100 million annually.

“Since 1975, most DWSD customers have been paying for drainage as part of their water and sewer bills. DWSD is updating its drainage charge program to ensure all city parcels are equitably billed for their share of drainage costs.

“State regulation requires DWSD to rid millions of gallons more stormwater flow from the city’s combined sewers or invest an additional $1 billion in ‘gray’ infrastructure. Together with city residents and businesses, DWSD is using green stormwater infrastructure (GSI) to meet permit requirements and make Detroit one of the ‘greenest’ cities in America.

“Customers who reduce stormwater runoff on their property – by disconnecting from the sewer system, planting rain gardens, installing detention areas and pervious pavement – can earn credits to be applied to [their] bill. A $5 million per year capital partnership program has been established to provide a 50/50 match for approved nonresidential GSI projects.”


This report is an independent planning study led by the Detroit Collaborative Design Center and funded by the Ford Foundation. It considers possible GSI solutions for Detroit property owners that may earn drainage credits and contribute to Detroit neighborhoods, including recommendations for future consideration. This work does not represent DWSD nor was it completed on behalf of DWSD.

OVERVIEW

In Detroit today, citizens and city government alike are seeking solutions for stormwater management citywide. This project proposes opportunities for non-residential property owners to work together to implement shared green stormwater infrastructure (GSI) projects that control runoff, reduce drainage charges and contribute to neighborhood beautification and stabilization. These shared solutions provide GSI opportunities for property owners with limited options and for whom the drainage charge is a hardship. Design concepts respond to Detroit’s unique landscape and emphasize improved quality of life through green space, beautification of commercial corridors and stabilization of vacant land. Importantly, this project links commercial corridors to surrounding neighborhoods of varying vacancy.

An interdisciplinary team led by the Detroit Collaborative Design Center has developed GSI strategies that tie neighborhood landscape opportunities to drainage policy and offer citywide lessons. Through an initial analysis of existing GSI resources and initiatives, the team identified a gap in GSI strategies for non-residential properties that meet neighborhood urban design goals and support Detroit property owners. This report documents an investigation of the design, engineering, legal, financial, implementation and maintenance implications of shared GSI strategies that manage runoff from multiple non-residential properties in community green spaces. This work focuses on strategies for Grandmont Rosedale and Brightmoor neighborhood commercial corridors that have lessons for commercial corridors and adjacent neighborhoods citywide.

You can access more background information and digital appendices at the project website: WWW.DCDC-UDM.ORG/COMMUNITY/STORMWATER.HTML
SHARED GSI SOLUTIONS FOR COMMERCIAL CORRIDORS AND SURROUNDING NEIGHBORHOODS: WHO BENEFITS?

The guiding concept behind this document is that shared GSI solutions provide more options for Detroit property owners seeking to alleviate their drainage charge and provide creative options for green spaces that strengthen communities. Such solutions can take many forms on different sites, several of which are identified here with an emphasis on utilizing Detroit’s vacant spaces to benefit property owners, neighbors, and the city.

PROPERTY OWNERS
Property owners benefit from shared GSI solutions that have the potential to reduce their drainage charge if onsite options are limited. There are also additional economic benefits to GSI.

CORRIDORS & NEIGHBORHOODS
Well-designed GSI benefits commercial corridors and neighborhood quality of life by creating more welcoming spaces to visit and more intentional and beautiful landscapes. Community development corporations (CDCs) have the potential to support corridor-wide GSI initiatives.

DETROIT WATER & SEWERAGE DEPARTMENT (DWSD)
Incentivizing property owners to install GSI helps reduce the volume and peak flow of runoff reaching CSOs in need of treatment and contributes to overall green acres in the city.

PLANNING & DEVELOPMENT DEPARTMENT (PDD)
Shared and offsite GSI strategies offer solutions for priority planning areas focused on denser commercial corridors and surrounding residential neighborhoods of varying density. This project proposes solutions that link corridors to communities and offer a feasible option for the GSI implementation.

Non-Residential
Shared GSI Scenario
- Occupied Parcels
- Vacant Properties
- Buildings
- Shared Green Infrastructure
- Properties investing in GSI
- Alley Conveyance
- Greenway
- Stormwater Runoff

Multiple property owners invest in a shared GSI project that reduces their drainage bill and benefits their community.

For more information on benefits to property owners, see Stacked Benefits for Property Owners, 34.

STEPS TOWARD SHARED GSI
This project primarily focuses on bioretention, which captures runoff in a depressed planting area and facilitates a range of planting options that contribute to neighborhood beautification. Bioretention allows runoff to infiltrate into the soil (volume reduction) and/or controls flow to a drain that connects to the sewer system (peak flow reduction). There is an array of other GSI solutions that are suitable for Detroit properties and detailed in DWSD resources. This document defers to existing DWSD recommendations and policy, which is accessible on their website: detroitmi.gov/drainage

This document details key considerations for shared GSI in Detroit neighborhoods in the following sections:

HIGH & LOW DENSITY URBAN DESIGN STRATEGIES
Urban design concepts focus on opportunities for shared GSI along Fenkell Road and Grand River Avenue and in adjacent neighborhoods. Strategies build from other work in the area and offer citywide lessons.

SITE SPECIFIC SHARED GSI SCENARIOS
Site-specific design and engineering examines constraints and calculations unique to shared GSI practices with policy implications.

STACKED BENEFITS FOR PROPERTY OWNERS
GSI offers many benefits to neighborhoods, property owners and cities, which are detailed and quantified here.

LEGAL AGREEMENTS & CONSIDERATIONS
This document details key items that should be included in legal agreements between property owners, as well as other related legal considerations.

MAINTENANCE NEEDS
Maintenance recommendations for shared GSI should follow DWSD specifications and also result in a maintenance agreement between property owners with defined roles and responsibilities.

IMPLEMENTATION TIPS
Steps toward implementation will include hiring contractors and navigating city permitting, which are detailed here along with lessons learned from other shared GSI projects underway.

FINANCING OPTIONS FOR OWNERS, CDCs & DWSD
A range of funding options have been weighed in the recommendations for GSI financing at various scales that make sense and cents.
This work is the result of a team approach to interdisciplinary considerations for implementing shared and offsite GSI strategies for non-residential properties.

**Design and engineering** of site specific shared solutions by livingLAB resulted in a thorough analysis and understanding of the many variables inherent to this work that contributed to recommendations. Neighborhood-wide strategies were generated by the Detroit Collaborative Design Center (DCDC).

A far-reaching **legal analysis** by the Great Lakes Environmental Law Center led to recommendations for contracts and property instruments to facilitate shared GSI. This legal framework recommends that property owners enter into contractual agreements to navigate GSI requirements. Neighborhood nonprofits may provide overarching organizational support.

An exhaustive look at **financing opportunities** by Zachary & Associates, Inc. seeks to develop feasible models by which property owners can fund GSI projects with support from corridor nonprofits and DWSD.

Steps toward **implementation and maintenance** unique to shared GSI practices were detailed by OHM Advisors and Fai Foen.

The myriad of **benefits** associated with GSI were researched and compiled by Erma Leaphart.

The work also includes collaboration with property owners and commercial corridor nonprofits, specifically Grandmont Rosedale Development Corporation, Brightmoor Artisans Collective, and Southwest Detroit Business Association.

This work is made possible through the cross-pollination across this team of multidisciplinary experts. The process entailed several in person meetings with different combinations of team members, in acknowledgment that many of these issues overlap. All of these team members are also working on GSI projects independently, which benefit from this collaboration. Further, lessons from this collaborative approach will extend to the various groups in Detroit focusing on GSI solutions citywide.
This study focuses on how GSI can help bridge high and low density Detroit neighborhoods. To provide specific and transferable recommendations, this work centers on two neighborhoods in northwest Detroit: Grandmont-Rosedale and Brightmoor. The link between higher density commercial and residential cores and adjacent areas with greater vacancy and landscape opportunities is a framework that also guides other planning initiatives in the city. Grand River Avenue and Fenkell Avenue, the respective commercial corridors in higher density Grandmont-Rosedale and lower density Brightmoor are characteristic of many Detroit neighborhood retail strips, and offer citywide lessons. The Fenkell and Grand River maps included in this report depict ownership and vacancy patterns within the sewer subcatchment areas that encompass the corridors. Subsequent maps illustrate a vision for shared neighborhood GSI opportunities fully realized along the corridors and in surrounding communities.

Site specific shared GSI scenarios on both corridors further inform recommendations. The study also considers shared GSI scenarios along West Vernor Highway, where the Southwest Detroit Business Association and property owners are seeking ways to reduce drainage charges through district-wide GSI.

Planning & Development Department

Over the last year, PDD and their lead planning consultant, Design Workshop, developed a neighborhood framework strategy that proposes streetscape improvements, adaptive re-use projects, and vacant land activation to support new economic opportunities in Grandmont-Rosedale, Old Redford and surrounding communities. The framework also incorporates stormwater solutions focusing on residential lots and roadways. They have in on proposals for the neighborhood surrounding Holcomb school, north of Grand River; with specific locations recommended for GSI. Overall goals include reducing flooding, limiting runoff reaching the combined sewer system, and contributing to an overall neighborhood landscape design strategy. This project proposes how non-residential property owners on Detroit’s commercial corridors can contribute to the implementation of GSI practices on vacant land in adjacent neighborhoods. Grand River commercial properties investing in GSI proposed for the Holcomb area provides one example of how this work can support larger planning goals.

Detroit Water & Sewerage Department (DWSD)

DWSD has been focusing their efforts in the Upper Rouge Tributary area, implementing a series of green stormwater control projects in parks and roadways and envisioning larger scale neighborhood solutions. There is ample opportunity for DWSD to partner with private property owners in support of projects that reduce CSO overflow and flooding, contribute to neighborhood quality of life, and create opportunities for property owners to alleviate the drainage charge by investing in GSI. Increased opportunities for shared and offsite GSI will support property owners who have limited options for managing stormwater onsite.

Professor Joan Nassauer, University of Michigan

Joan Nassauer is leading an Erb-funded research endeavor investigating large scale GSI opportunities in the Brightmoor neighborhood through an in-depth and neighborhood-wide approach to stormwater catchment and treatment. This work also includes a comparative study of GSI governance in legacy cities. The work included in this document does not seek to duplicate neighborhood analysis and research completed by Professor Nassauer and others but rather complement it with a focus on commercial corridors and smaller-scale near-term solutions.
FENKELL AVENUE

The Fenkell Avenue sewer subcatchment area in the Brightmoor neighborhood encompasses the entire commercial strip. Like many neighborhood commercial corridors in Detroit, Fenkell Avenue has plenty of vacant parcels, many of which are publicly owned. The amount of pervious surface area in the Fenkell subcatchment area makes a case for GSI as an infill strategy along the commercial corridor and on adjacent vacant residential lots. Using basic rules of thumb, all runoff from non-residential properties along Fenkell could be managed in existing 0% impervious lots.

FENKELL AT A GLANCE

18% publicly owned 12% faith-based ownership
21% (7.38 ACRES) = 0% IMPERVIOUS
43% (15 ACRES) PERVIOUS overall
20 ACRES IMPERVIOUS = $13,000/MONTH drainage fees
FENKELL CORRIDOR GSI
Due to ample publicly-owned vacant land, infill GSI strategies make sense along Fenkell. Design solutions that manage stormwater runoff from multiple properties and add interest and beauty to the street edge would help stabilize the corridor and reduce drainage charges for Fenkell owners. This could include credits for managing right of way (ROW) runoff. Additional opportunities lie in the vacant residential property adjacent to the commercial corridor; including a GSI greenway linking key green spaces in the neighborhood. The diagram on the next page suggests additional sites for GSI on vacant properties at street corners that could be used as offsite GSI to manage water from the ROW, as well as large swaths of vacant land in type A soils ideal for infiltration.

Note: These diagrammatic suggestions highlight opportunities for shared GSI but require further site-specific analysis. These proposals also require the cooperation of city agencies.

SHARED GSI OPPORTUNITIES
In addition to infill GSI solutions along Fenkell, there are other key GSI opportunities highlighted for this subcatchment area that take advantage of vacant land in the neighborhood, which is a common condition throughout the city.

- **Immediate Adjacencies [Phase I]**: Vacant lots immediately adjacent to the commercial corridor often separated by an alley, are prime sites for GSI that manages runoff from commercial corridor properties when infill is not an option.
- **Primary Path [Phase II]**: The primary path links vacant lots closest to the commercial corridor and creates a greenway traversing the neighborhood. The secondary path links the primary path to key parks in the community.
- **Secondary Path [Phase II]**: “Adjacent GSI” refers to green space connected to the primary and secondary paths.
- **Streetside GSI [Phase III]**: Streetside GSI is proposed where vacant land is located at street corners, prime locations for capturing and managing runoff from the ROW.
- **GSI Park [Phase III]**: GSI parks are sited on multiple contiguous parcels in soil type A.

Soil Type A
Occupied Parcels
Vacant Properties
Commercial/Public/Faith-Based Ownership (Source: makeloveland)
0% Impervious Cover (Source: DWSD)
Rouge River
Outfall Point

Fenkell Ave
Dacosta St
Parkway St
Chalfonte Ave
Bramhall St
Rockdale St
Lahser Rd
Graydale St
Keeler St
Bentler St
Braile St
Kentfield St
Plainview St
Midland St
Chatham Ave
Fenkell Ave
Lampert Av
Outfall Point
W Parkway St
0% Impervious Cover (Source: DWSD)
Commercial/Public/Faith-Based Ownership (Source: makeloveland)
Vacant Properties
Occupied Parcels
Vacant Properties
Commercial/Public/Faith-Based (Source: makeloveland)

Outfall Point
Rouge River
0% Impervious Cover (Source: DWSD)

Immediate Adjacencies [Phase I]
Proposed GSI Site Opportunities
Soil Type A
Primary Path [Phase II]
Secondary Path [Phase II]
Adjacent GSI [Phase III]
Streetside GSI [Phase III]
GSI Park [Phase III]

Adjacent GSI [Phase III]
Streetside GSI [Phase III]
GSI Park [Phase III]

Soil Type A
Occupied Parcels
Vacant Properties
Commercial/Public/Faith-Based (Source: makeloveland)
0% Impervious Cover (Source: DWSD)
Rouge River
Outfall Point

Fenkell corridor
34.7 AC
7.38 AC
21%

Eliza Howell Park
Rouge Valley Parkway

Higher Density
Formal Pocket Park
Parking Lot Bioswales
Wetland Purification
Retention Basin/Recreation Path

Neighborhood GSI Opportunities

Fenkell Properties Analysis
Prepared by the Detroit Collaborative Design Center 12.07.17

Fenkell Ave
Keeler St
Keeler St
Keeler St
Midland St
Chalfonte Ave

Lliad St
Virgil St
Riverdale Ave
Grayfield St
Hazelton St
Beaverland St
Bramell
Chatham
Lamphere
Dacosta St
Rockdale St
Dolphin St
Burgess
Graydale St
Chapel St
Bentler St
Westbrook St
Lahser Rd
Parkway St
Blackstone St
Trinity St
Burt Rd
Pierson St
Braile St
Fielding St
Patton St

Evergreen Rd
Plainview St
Auburn St
Mick St
Grandville Ave
Piedmont St
Warwick St
Plymouth Rd
Burgess
Graydale St
Chapel St
Bentler St

Westbrook St
Lahser Rd
Parkway St
Blackstone St
Trinity St
Burt Rd
Pierson St
Braile St
Fielding St
Patton St

Evergreen Rd
Plainview St
Auburn St
Mick St
Grandville Ave
Piedmont St
Warwick St
Plymouth Rd
Burgess
Graydale St
Chapel St
Bentler St

High Density
Formal Pocket Park
Parking Lot Bioswales
Wetland Purification
Retention Basin/Recreation Path

Low Density
neighborhood gsi opportunities
Grand River/McNichols at a Glance

47 acres impervious = $31,000/month
28 acres (37%) pervious
0.64 acres (1%) = 0% impervious
LAND RE-USE

The Lahser Node vision creates an active community hub in Old Redford including mixed-use development, commercial and retail businesses, an international marketplace, and memorable destinations around a neighborhood trail, the Art Loop. To support this engaging central space, public parcels are reenvisioned as an eclectic and walkable neighborhood that includes the rehabilitation of existing structures, a new format for integrated urban homesteading, flexible landscape spaces and green infrastructure that will manage neighborhood stormwater while providing new neighborhood amenities.

The Lahser Node will serve as a model for holistic redevelopment and management of publicly owned parcels that integrates community assets and resident desires with infrastructure needs and workforce opportunities. The following pages outline criteria for making decisions about the reuse and reevaluation of publicly owned parcels.

The strategy at the Lahser Node includes:

- 70 rehabilitated homes
- 16 sites for residential homesteads (50 parcels)
- 50 lots available for sidelot acquisition
- 40 sites for new green space through the flexscape program (125 parcels)
- 25 sites dedicated to green stormwater infrastructure (110 parcels)
- 19 sites dedicated toward a reforestation program (153 parcels)
- 26 sites with mixed-use, commercial or multifamily redevelopment potential (35 parcels)

LAND RE-USE RECOMMENDATIONS

Offsite GSI is an opportunity for Detroit property owners to invest in neighborhood GSI projects when they cannot implement onsite strategies. Property owners should receive credits for managing runoff from impervious areas adjacent to the offsite GSI practice.
OPPORTUNITIES FOR PLANNING

This project proposes opportunities for non-residential property owners to work together to implement shared GSI projects that control runoff, reduce drainage charges and contribute to neighborhood beautification and stabilization. This strategy takes advantage of Detroit’s landscape of mixed-occupancy corridors flanked by lower density neighborhoods. Shared GSI solutions along commercial corridors can be implemented by private property owners alone but will hugely benefit from the organizing capacity of neighborhood community development corporations (CDCs) championing corridor improvements. Furthermore, these efforts require the support and cooperation of city agencies including DWSD, PDD and the Detroit Land Bank Authority (DLBA).

In turn, this approach aligns with key City-led planning initiatives and could contribute to several related efforts. First, proposed solutions provide a stronger connection between commercial corridors and the neighborhoods surrounding them, a primary planning unit for PDD.

GSI strategies linking corridors to varied-vacancy neighborhoods are applicable citywide and especially in PDD focus neighborhoods. GSI provides a mechanism by which to both strengthen commercial areas and implement creative land use solutions on vacant residential land.

Related, this project resonates with the Mix Tape Zoning initiative, which focuses on best practices for Detroit’s 100 miles of commercial corridors. The recently announced bond to fund improvements on neighborhood commercial corridors will hopefully include ample GSI in the service of complete streetscapes, which could be coupled with opportunities for property owners to invest in GSI in exchange for drainage credits. This project also has the potential to inform the Public Lands Plan, which should include GSI proposals that link to larger neighborhood strategies.

The citywide Public Lands Plan could also set the stage for public-private partnerships to implement longer term and larger scale GSI projects led by DWSD and other city departments that benefit neighborhoods, greatly reduce water treatment costs, and provide opportunities for property owners to invest.

With DWSD, PDD and DLBA working together with commercial property owners and local CDCs, shared GSI strategies have the potential to benefit Detroiters and align with larger neighborhood planning efforts. The following steps would enable this vision:

» DWSD indicates priority areas for controlling stormwater and supports non-residential property owners implementing GSI through the drainage credit.

» PDD leads neighborhood planning efforts that develop a framework for landscape opportunities, including GSI.

» DLBA sells or designates land for GSI that aligns with larger neighborhood plans.

» Neighborhood CDCs help facilitate a district-wide approach to GSI, organize property owners, and navigate drainage credits.

» Non-residential property owners invest in the construction and maintenance of shared GSI strategies for drainage credit.

The drainage charge is a common challenge for commercial property owners across the city and shared GSI solutions can help, but require support from municipal departments. Neighborhood CDCs play an important role as stewards to help implement GSI at a district-wide scale.
SITE SPECIFIC SHARED GSI

The following pages detail site specific shared GSI strategies that the team investigated with community partners in order to understand real constraints that face Detroit property owners. There are several scenarios with different site conditions. Conceptual site design is informed by community needs. Each scenario includes practice-based GSI performance calculations, estimated drainage charges, and anticipated GSI credits for multiple property owners. Legal considerations are also noted, along with policy recommendations regarding credit eligibility and allocation. The major policy considerations that allow for creative GSI solutions that make sense for Detroit property owners and neighborhoods are included here.

CALCULATING FOR SHARED CREDITS

The site specific design scenarios included here utilize the credit calculation approach detailed in DWSD’s Guide to Drainage Charge Credits. Volume and peak flow performance is calculated for the GSI practice and drainage area as a whole and then credits are allocated to each site according to the percentage of impervious surface area of each participating parcel reaching the management practice. A new area definition is used in drainage calculations to account for the total drainage area controlled by shared GSI practices that extends beyond property lines. “Impervious Drainage Area Claiming” is used to describe the impervious area controlled by the shared GSI practice that is claimed by participating property owners for credit. This could include both private property and right of way, depending on site specific circumstances.

DWSD ADMINISTRATION

DWSD currently allows shared GSI practices. This project recommends that participants in a shared GSI scheme submit a single common application to DWSD that documents credit allocation between property owners. The application would identify all the parcels that will be part of the scheme. If DWSD approves the application, it can include a copy of the approval materials in each file related to a parcel and identify customers who are part of a shared GSI scheme by adding a code to each shared GSI participant’s bill. Each property is billed and credited individually but is tracked as a group associated with the shared GSI practice. DWSD may also consider geographically tracking shared GSI practices and their tributary areas in GIS to avoid overlapping drainage areas.

RECOMMENDATION: CREDITS FOR RIGHT OF WAY (ROW) RUNOFF

Private property owners should receive credit for runoff from the public ROW that is controlled by their GSI practice. This is not currently allowed by DWSD policy. Where the naturally-occurring drainage area of a GSI practice includes ROW, the impervious ROW area within the drainage area should be able to be claimed by one or more participating property owners as long as total impervious drainage area claimed does not exceed total impervious area for each property owner. In other words, the ROW impervious area claimed must offset impervious area within the parcel boundary not already reaching the GSI practice. The amount of credit received for managing runoff from the ROW should be determined by the ROW impervious area controlled.

Site Specific Scenario Key

- Property Boundary
- Total Site Drainage Area Boundary
- Impervious Drainage Area Claimed by Property Owner 1
- Impervious Drainage Area Claimed by Property Owner 2
- Flow of Water

For more information on calculation methods, see the methodology Appendix at dcde-udm.org/community/stormwater.html.

RECOMMENDATION: CREDITS FOR OFFSITE GSI

Building upon proposed ROW stormwater management opportunities and existing shared stormwater practice policies, offsite GSI should also be an option for Detroit property owners who cannot implement onsite strategies. This is not currently allowed by DWSD policy. Offsite stormwater management refers to a GSI practice that is installed and maintained by a property owner or group of property owners and located on a separate nonadjacent parcel. A property owner should be able to receive credits for managing runoff from impervious areas adjacent to the GSI practice. Proposed credits for offsite GSI are limited by the amount of ROW or other runoff that can be directed to and controlled by the GSI practice. Properties should be able to claim credits for managing runoff from offsite impervious areas up to the amount of impervious area of the property for which they are claiming credits.

Site specific calculations, conceptual site plans, and cost estimates were prepared by livingLAB.
**Brightmoor Artisans Collective**

This site manages runoff from two property owners in a GSI practice owned by one of the property owners on adjacent vacant lots. The design accommodates community use of these lots.

**Policy Implications**
- Proposed credits for managing ROW runoff that offsets the private impervious area not reaching the GSI practice.
- Water is conveyed via the public alley.

**Legal Considerations**
- A contract is recommended between runoff-generating property owners, which in this case includes the GSI owner.
- A restrictive covenant should be in place to ensure the GSI land use for a set duration.
- An easement or license may be necessary for using the alley to convey water.

See the Legal section of this report for more details.

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**Speedy Gas Station**

This scenario includes bioretention on public land that manages runoff from the adjacent business as well as ROW runoff that could result in credits allocated to an offsite GSI investor.

**Policy Implications**
- Credits for managing ROW runoff could be allocated to Speedy as well as a second offsite property owner along Fenkell to offset impervious area that cannot be otherwise managed on site.
- The water quality of gas station runoff needs further consideration.
- A permit is necessary to install the spillway.

**Legal Considerations**
- The GSI property is publicly owned and could be sold to Speedy and a property instrument should be in place to ensure that the land remains dedicated to GSI.
- A contract should be in place between the runoff-generating property owners and rain garden property owner.
- A license or easement is necessary to install the ROW spillway.

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**Cost Estimate**: $45,000-$55,000

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**Cost Estimate**: $65,000-$80,000

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**Practice Volume Credit**: 35.4%
**Practice Peak Flow Credit**: 75.8%

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**Practice Volume Credit**: 95.7%
**Practice Peak Flow Credit**: 100.3%
**GRAND RIVER - INFILL**

This site strategy proposes GSI installed on property owned by Grandmont Rosedale Development Corporation that manages runoff from their buildings and an adjacent parking lot and liquor store. In this scenario there is also a non-participating land owner:

**POLICY IMPLICATIONS**
- If water must be conveyed via the public alley, permits may be necessary and ROW water managed should receive credits.

**LEGAL CONSIDERATIONS**
- A contract is recommended between the runoff-generating property owner and the rain garden property owner.
- A restrictive covenant would ensure the GSI land use.
- A license or easement may be necessary if water is conveyed via the alley.

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**GRAND RIVER - RIGHT OF WAY**

Although illustrated on Grand River, credits for installing GSI in ROW is only recommended for city-owned roads at this time because the state and county are also subject to the drainage charge, independently negotiated with DWSD. Nevertheless, opportunities abound for GSI in Michigan and Wayne County ROW and related partnerships with private property owners, with the possibility of reduced drainage charges for both:

**POLICY IMPLICATIONS (FOR CITY ROADWAYS ONLY)**
- Proposed credits for managing ROW runoff that offsets the private impervious area not reaching the GSI practice.
- GSI in the ROW will require support and permitting from DPW as well as a DWSD offsite GSI policy.

**LEGAL CONSIDERATIONS (FOR CITY ROADWAYS ONLY)**
- An easement should be granted to ensure that GSI stays in place in the public ROW.
- A ROW permit and Right of Entry permit are also required.
GRAND RIVER - OFFSITE

This scenario proposes an offsite GSI solution sited on a property already proposed for GSI by PDD’s neighborhood design process. Proposed offsite GSI and credits are limited by the amount of runoff from adjacent ROW or other impervious areas that reaches the GSI practice. In this scenario, several Grand River property owners with limited space for onsite GSI invest in an offsite solution within the same sewer subcatchment area. One or more non-residential property owners can invest in an offsite GSI practice that offsets runoff from their onsite impervious area.

POLICY IMPLICATIONS
- Credits for managing ROW runoff that offsets onsite impervious area not reaching the GSI practice.
- An offsite policy needs to be developed to enable this type of practice, as well as a related ROW runoff management policy.
- DLBA could become an active partner in offsite GSI opportunities that align with city planning priorities and benefit private property owners.

LEGAL CONSIDERATIONS
If private property owners are investing in GSI and receiving credits on an offsite property owned by a third party, the GSI host would grant an easement or license to the property owners receiving drainage credits. The participating property owners would also have a separate contract amongst themselves. If a private property owner is interested in hosting offsite GSI and also receiving credits, the GSI host and any other participants would enter into one single contract, and a restrictive covenant would cover the GSI practice. Possible owners for offsite GSI include the onsite property owner receiving credit, other private property owners, and partnering city agencies.
This scenario looks at two different solutions for GSI on the Southwest Detroit Business Association (SDBA) property and their parking lot next door. Currently, water from five different properties falls within the drainage area that reaches the SDBA parking lot. The scenarios explored here look at credit allocations for three participating property owners. In this neighborhood, SDBA seeks to model possible GSI solutions that can benefit West Vernor property owners at a larger scale. A strong corridor-focused nonprofit can be the organizer and champion for shared GSI that reduces the drainage charge for property owners and adds value to the corridor as a whole.

**Policy Implications**
- If water must be conveyed via the public alley, permits may be necessary and ROW water managed should receive credits.

**Legal Considerations**
- A **contract** is recommended between participating property owners, including the runoff-generating property owner and the GSI property owner.
- A **restrictive covenant** would ensure the GSI land use.
- A **license** may be necessary for using the alley to convey water.

### Cost Estimates

- **Rain Gardens:** $93,000-$170,000
- **Permeable Pavers:** $190,000-$220,000

### A. SDBA
- Monthly drainage charge = $661 * (0.24 + 0.19) = $284.23
- Annual charge = $3410.76
- Rain Gardens:
  - Total site credit = 29.6%
  - Annual savings = $1009.58
- Permeable Pavers:
  - Building credit = 50%
  - Parking lot credit = 72%
  - Annual savings = $2036.94

### B. Theatre
- Monthly drainage charge = $661 * .40 = $264.40
- Annual charge = $3172.80
- Rain Gardens:
  - Total site credit = 28.8%
  - Annual savings = $913.77
- Permeable Pavers:
  - Total site credit = 71.1%
  - Annual savings = $2255.29

### C. Vacant Lot
- Monthly drainage charge = $661 * .08 = $52.88
- Annual charge = $634.56
- Rain Gardens:
  - Total site credit = 29.6%
  - Annual savings = $187.83
- Permeable Pavers:
  - Total site credit = 72%
  - Annual savings = $456.88

Preparing by Dwight A.

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**SDBA Parking Lot**

- If water must be conveyed via the public alley, permits may be necessary and ROW water managed should receive credits.
- A **contract** is recommended between participating property owners, including the runoff-generating property owner and the GSI property owner.
- A **restrictive covenant** would ensure the GSI land use.
- A **license** may be necessary for using the alley to convey water.
STACKED BENEFITS FOR PROPERTY OWNERS
Prepared by Erma Leaphart

Green Stormwater Infrastructure (GSI) involves natural drainage practices or techniques that mimic nature. They protect water quality and reduce the amount of stormwater runoff by slowing it down, providing storage and infiltration, and allowing it to evaporate where it falls—all in a more cost effective manner than conventional “gray” infrastructure. In addition to the economic benefits, GSI also provides environmental and social benefits thereby creating a “triple” bottom line. These practices can be adopted by property owners including governments, businesses, residents and organizations and developed at the site or building scale, neighborhood and public space scale or expanded community-wide.

BENEFITS OF MOST GREEN STORMWATER INFRASTRUCTURE PRACTICES INCLUDE:
- Improved water quality (healthier drinking water)
- Reduced incidences of flooding (lower or eliminated costs associated with flood damage)
- Reduced amount and cost of energy needed for disinfection and treatment of combined sewage/stormwater mix at wastewater plants (lowering operational costs)
- Reduced need for more expensive gray infrastructure (eliminating or lowering expensive infrastructure costs, which are ultimately passed on to the rate payer)
- Increased opportunities for green collar jobs (green infrastructure construction/ installation, maintenance and inspection jobs are anticipated as GSI practices expand)
- Stormwater (drainage) fee credit (reduce the drainage charge applied to properties through credits)

BENEFITS OF GREEN STORMWATER INFRASTRUCTURE FOR PRIVATE, COMMERCIAL PROPERTY OWNERS INCLUDE:
- As reported by the National Resources Defense Council
  - Increased rents and property values
  - Increased retail sales
  - Energy savings
  - Reduced infrastructure costs
  - Reduced costs associated with flooding
  - Reduced water bills and stormwater credits
  - Community cohesion and reduced crime
  - Increased mental health and worker productivity for office employees

BENEFITS OF GSI IN DETROIT
The vision for our city as the “Greenest City in America” has been attributed to both Mayor Duggan and DWSD Director, Gary Brown. The city’s Planning and Development Department (PDD) has incorporated green infrastructure into recent neighborhood planning initiatives. The Detroit Housing and Revitalization Department and the General Services Department are also incorporating GSI into plans and activities.

The business community’s role is vital to the success of this vision. The city cannot nor should it have to accomplish a “Green Culture Shift” on its own. The triple bottom line benefits related to our economy, environment, and social fabric will have greater impact when our collective efforts are aligned. We must all be active participants in GSI implementation as land and water stewards.

Businesses (and communities) that work together in a shared GSI practice or in some aspect of a cooperation will reap shared value and benefits. “Local greening efforts are most effective when retailers work together, as in a formalized business district, to create a larger-scale shopping environment for customers” (The Green Edge). Benefits include improved air quality, reduction in heat island effect, crime reduction, and nature scape aesthetics are all appealing to customers and employees potentially increasing retail sales, rental fees and possibly property values. Quantifiable benefits for commercial property owners are further detailed below.

Higher Rents/Occupancy
- Landscaping (including bioretention practices like rain gardens, bioswales, wetlands, ponds and street planters) can add approximately 7% to average rental rates for office buildings.
- One study found green roofs can add 16% to the average rental rate for multifamily units.
- Customer’s willingness to spend more on retail purchases (see below) in areas where there is green infrastructure suggests that retail building owners should be able to earn rental premiums for providing green infrastructure amenities.
- Building occupancy rates were found to be 8% higher in LEED Certified buildings and 3% higher in EnergyStar labeled buildings (possibly due to a presumption of occupying a healthier building and healthy work environment).

Property Value
- Studies have shown that landscaping and trees increase residential property value by 2 to 5%. There may be similar increases in value related to commercial properties.

Customer Spending
- Attractive, well-designed landscaping, good tree cover or green streets along urban business districts and strip malls can lead to consumers willing to spend more on products, visit more frequently and travel further to shop.
- In areas with mature tree canopy, customers indicate a willingness to pay 8 to 10% more to shop in an area with a more park like setting.
ENERGY SAVINGS
- Green roofs and tree plantings generate savings on heating and cooling.
- Green roofs provide better insulation than conventional roofs, reduce the amount of solar radiation, and reduce surface temperatures.
- A recent study showed a green roof can reduce daily energy demand for cooling in a one-story building by more than 75% in southern California.
- The US Forest Service models show modest energy savings in the Midwest of approximately $45/year in reduced cooling costs in summer and heating costs in winter per tree.

INFRASTRUCTURE COSTS
- Green roofs have a longer life cycle than conventional roofs – 40 years versus 20 years.
- As an example, a medium sized office building with a 20,000 sq. ft. roof could save $270,000 in cost avoidance based on costs for repair and replacement.
- Permeable pavement in a parking lot has a higher initial cost but lower maintenance costs compared to asphalt along with savings from reduced snow removal and salt applications.

FLOODING INCIDENCES
- Although harder to quantify, reducing the volume of stormwater runoff can lessen the frequency and severity of flooding by reducing the overall volume of sewage / stormwater mixture flowing into the combined sewer system and the polluted overflow directly into our rivers. Some studies show a 2 to 8% property value increase as a result.

WATER BILL REDUCTION
- Harvesting stormwater using rain barrels and/or cisterns helps to save money on costs for landscape irrigation and other non-potable water uses. This depends on need and rain pattern. A study involving larger buildings in New York and Seattle showed a 50-60% savings on water needed for toilet flushing when reusing captured stormwater.

COMMUNITY COHESION
- Green infrastructure can provide a pleasant space to gather and by attracting more people there is an improvement in the safety and security within an area.
- Similar to the broken window theory, well maintained and designed green infrastructure gives the appearance of a well cared for and watched over property/area. This can lead to savings in insurance, and avoided costs associated with burglary and vandalism.

EMPLOYEE WELL-BEING
- Office workers with a view of nature can lead to improved health, job satisfaction and reduced stress and turnover. This is especially valuable for companies that rent commercial space and their employees. However, property owners may be able to realize an increase in rent for providing green infrastructure amenities.

Customers indicate a willingness to pay 8 to 10% more to shop in areas with mature tree canopy.

Well maintained and designed green infrastructure can lead to savings in insurance, and avoided costs associated with burglary and vandalism.

IMPROVEMENTS IN QUALITY OF LIFE AND ENVIRONMENTAL BENEFITS:
- Water Quality – healthier drinking water due to fewer polluted overflows.
- Air Quality – reductions in CO2, SO2 and harmful particulate matter that are captured by trees and plants.
- Green House Gas reductions – similarly due to carbon dioxide that is captured by trees and plants.
- Reduction in urban heat island effect - which worsens asthma and respiratory diseases.
- Eco-system – GSI incorporating native plants provides healthy habitat for pollinators needed for healthy food production.

BENEFITS OF SHARED GSI
These greening efforts can be especially effective when multiple property owners, as in a Business Improvement District, work together to improve a retail corridor. Research has turned up very little on the idea of and benefits specific to shared GSI practices. However, one can assume that if the GSI practice is located in close proximity to each of the participating businesses, then mutual benefits such as closeness to nature, shading, green space, cooler temperatures, etc. will also be shared. Further, by sharing financial responsibilities including installation and maintenance costs, each partner’s respective costs are lowered. There is also potential for sharing other environmental, quality of life and economic benefits cited above including being a part of an area that will have a positive reputation for green design, pleasing landscape, safe community and valuing sustainability or a triple bottom line business ethic.

SOURCES


SEMCOC, Green Infrastructure, https://www.semcog.org/Green-Infrastructure


CALCULATORS:

Well maintained and designed green infrastructure gives the appearance of a well-cared for and watched over property/area. This can lead to increased safety, savings in insurance, and avoided costs associated with burglary and vandalism.

Bioretention
- Mixed soil for infiltration
- Decorative hardscape
- Overflow pipe and drain
- Gravel bed
- Curb cut for parking lot runoff

Customer Spending
Attractive landscaping along urban business districts can lead customers to spend more on products, visit more frequently, and travel further to shop. In areas with mature tree canopy, customers indicate a willingness to pay 8 to 10% more to shop in an area with a more park like setting.

Property Value
Studies have shown that landscaping and trees increase residential property value by 2 to 5%.

Community Cohesion
Well maintained and designed green infrastructure gives the appearance of a well-cared for and watched over property/area. This can lead to increased safety, savings in insurance, and avoided costs associated with burglary and vandalism.

Higher Rents
Landscaping can add approximately 7% to average rental rates for office buildings.

Employee Well-Being
Office workers with a view of nature can lead to improved health, job satisfaction, and reduced stress and turnover.

Flooding Incidences
Reducing the volume of stormwater runoff can lessen the frequency and severity of flooding.

Energy Savings
US Forest Service models show modest energy savings in the Midwest of approximately $45/year in reduced cooling costs in summer and heating costs in winter per tree.

Environmental Benefits
GSI provides healthy habitat for pollinators needed for healthy food production.

Benefits of Green Stormwater Infrastructure
These greening efforts can be especially effective when multiple property owners, as in a Business Improvement District, work together to improve a retail corridor.

Please see sources on the previous page.
INTRODUCTION

In its most recent drainage charge manual, DWSD sets out a basic policy for multiple parcel owners to share a stormwater practice and the ensuing credits. The current policy requires that the shared GSI participants enter into a contract that documents the shared GSI scheme.

Notwithstanding the current DWSD policy, developing contracts as well as property instruments (documents that define property interests) such as restrictive covenants, easements, and licenses, can help avoid problems and better ensure return on investment. Because these documents must be tailored to each specific situation, it is recommended that those interested in shared GSI consult an attorney.

It can be helpful to refer to an example when discussing these concepts. Imagine three commercial property owners: ABC, Inc., which owns a convenience store; Water United, a nonprofit that works on drinking water issues; and Clean Homes LLC, which owns a cleaning supply business. Each owns a parcel. The parcels are next to each other in the following order: ABC, WU, and CH. They decide to participate in a shared GSI scheme that involves a single large rain garden located on both ABC’s and WU’s property. Though not located on CH’s property, the rain garden is able to manage the stormwater from all three properties in a way that merits drainage fee credits for all three parcel owners.

- ABC
- WU
- CH

CONTRACTS

A contract between shared GSI participants allows them to shape how they will interact with each other in relation to the shared GSI practice. A good contract can prevent disputes from arising in the first place and can make disputes easier to resolve when they do arise.

It is important to note that any contract between shared GSI participants cannot be forced on future parcel owners. In our example, ABC, WU, and CH enter into a contract. Among other things, the contract defines how investment in the shared GSI will be made, identifies who will hire the O&M provider, and restricts each of them from altering the shared GSI or the rest of their parcels in a manner that jeopardizes the drainage credit. If WU sells its parcel to a restaurant called Zell’s, Zell’s does not automatically become a party to the original ABC-WU-CH contract, though it can voluntarily decide to be a part of it. Also, unless the contract says otherwise, it can continue to be valid between ABC and CH. In the section below on property instruments, there is an explanation for how to use a restrictive covenant—the property instrument that can limit one’s present and future use of their land—to ensure that future parcel owners take on the obligation to maintain the basic shared GSI scheme. By default, the original shared GSI contract will only apply to the original set of shared GSI participants.

Shared GSI participants can design any contract they like. There are hundreds of boilerplate and more specific terms that can be included in any contract. What follows is a description of certain kinds of contract terms that can address issues especially prevalent in the shared GSI context.

PREVENTING MATERIAL ALTERATIONS THAT WOULD JEOPARDIZE THE CREDITS

The amount of credit each shared GSI participant receives is based on the total performance of the shared GSI practice. That total number is allocated among the participants. If any participant materially alters the performance of the shared GSI—one that is to say, alters the shared GSI practice directly or alters the drainage area of the shared GSI practice such that it no longer performs as it used to—then there is a risk that all the participants will lose the credits, possibly before they have seen a return on their investment. It is important to focus on those alterations that can jeopardize performance in a way that may impact credits, which are material alterations, since one can alter GSI in other ways, such as switching from one kind of vegetation to another equally effective kind, without jeopardizing performance.

Imagine that some years after developing the shared GSI, WU converts the portion of the rain garden on its property into extra parking spaces. That would materially diminish the performance of the shared rain garden, likely resulting in credits being taken away from all three participants.

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1 DWSD has a collection of materials from November 2016 that describes drainage charge policy called Drainage Charge Documentation. One of the items in the collection is the Drainage Charge Manual: A Guide to the Drainage Charge (August 2016) and is available online at http://www.detroitmi.gov/Portals/0/docs/DWSD/A%20Guide%20to%20the%20Drainage%20Charge_,LItUp.pdf?ver=2016-08-17-125753-753.
2 See pages 12-13. It is not clear whether DWSD simply wants shared GSI participants to state that there is such a contract or whether it wants the actual contract as part of the application.
To avoid that, the contract can include a term that prohibits participants from materially altering the shared GSI. Since certain changes to other portions of a parcel may also diminish the shared GSI’s performance (e.g., significant regrading or converting pervious surface to impervious surface within the GSI’s drainage area), the contract provision can be written broadly to prohibit any changes to any of a participant’s parcel that would jeopardize the credits, at least not without the consent of the other participants.

**Distribution of Benefits and Obligations**

Through contract, shared GSI participants can distribute benefits and obligations as they wish. Benefits and obligations that should be considered include:

- **Capital investment**
- **O&M:** Which participant(s) will formally contract for the O&M services? What will each participant pay?
- **Approvals:** What must each participant do to ensure it has all the necessary government permits and approvals?
- **Other costs:** What will each participant pay for the cost of the credit application process, including GSI design and legal services?

Imagine the following: with the shared GSI in place, ABC will receive a 50% credit, CH a 75% credit, and WU a 25% credit; the capital cost is $50,000 total; O&M will be $800 per year; and the GSI takes up 20% of ABC’s property and 20% of CH’s. Among other possibilities, they can contribute equally to the $50,000 capital cost, or can contribute based on their share of the overall credits, or can contribute based on how much of their property they’re giving up for the GSI. They may decide to share the O&M cost equally, or have WU pay all of it since it is not hosting the GSI on his property, or any other way.

The takeaway is that shared GSI participants can manage risks by clearly defining the distribution of benefits and obligations in the contract.

**Construction of the GSI and Ongoing Operation & Maintenance**

There will likely be a contract between a landowner and the individual or company chosen to construct the shared GSI and later perform the O&M. However, shared GSI participants can also include provisions in their own contract related to construction and O&M. Those provisions can address:

- Will all the participants hire the contractor or only the participants who are hosting the GSI on their parcels?
- Which participants need to review and approve the contract?
- How will payment or reimbursement work?

It is worth highlighting two provisions that could go in the contract between the shared GSI participants and the contractor. The first is indemnification. In general, indemnification is a promise by someone else (the indemnifying party) to cover your losses (the indemnified party) if the indemnifying party does something that causes harm to you or causes a third party to sue you.

With regard to the contractor building the GSI or providing the O&M, shared GSI participants can ask those contractors to indemnify them from costs the participants may incur that are related to the contractor’s services. For example, if the contractor constructs the GSI in a way that causes injury to a third party or property, and that third party sues one or more of the shared GSI participants requesting damages related to the injury, an effective indemnification provision would require the contractor to reimburse, or perhaps even defend in court, the shared GSI participants to shield them from the costs of the lawsuit.

The second is a provision that assigns liability for construction or O&M that results in a reduction or loss of credits. Imagine a scenario where after a scheduled inspection DWSD removes the credits and forces the shared GSI participants to reapply because there was inadequate O&M that resulted in loss of shared GSI performance. Even without a specific provision to address this, any or all of the shared GSI participants can sue the O&M provider under various legal theories. However, expressly addressing this scenario in a contract can make it easier to resolve a future dispute.

**Response to a Breach of Contract**

Shared GSI participants can address various aspects of a breach of contract. Imagine that from the example above, WU erects a shed on part of the GSI on its property. That leads DWSD to eliminate the credits that were going to ABC, WU, and CH. If they want to earn a smaller credit percentage with the GSI that remains, they will have to re-apply.

Perhaps most importantly, the contract can include a provision that requires the parties to not alter GSI so as to diminish its performance. As described in detail below, a restrictive covenant will also contain that restriction and allow others to enforce it; however, covenants typically will leave out the details of enforcement. A contract can define more precisely what WU must do as a result of its breach of the non-alteration provision. For example: compensate ABC and CH for the value of the lost credits; pay ABC and CH a fixed sum (sometimes called liquidated damages) as a penalty for violating the contract; pay the costs of re-applying; remove the shed at its own expense and re-build the GSI, etc.
PROPERTY INSTRUMENTS

Parcel owners can develop property instruments to help ensure they can benefit for as long as necessary from drainage fee credits. Property instruments are legal documents that define what you can do with your land. There are two kinds of property instruments that are relevant to shared GSI: restrictive covenants and easements or licenses. Restrictive covenants apply to shared GSI located on private parcels that are owned by the shared GSI participants. Easements or licenses apply to shared GSI located on public property (or on the private property of someone not participating in the shared GSI scheme).

RESTRICTIVE COVENANTS

Restrictive covenants are property instruments that limit the way current and future owners of a parcel can use the parcel. Restrictive covenants can, for example, limit tree-cutting, the presence of certain kinds of vehicles, and the use of property for something other than residential or commercial purposes. When parcel owners invest in shared GSI that is located on one or more of the participants’ parcels, the owners can develop covenants to ensure that any person who buys one of those parcels will keep and protect the shared GSI. Otherwise, the new owner of a parcel containing the shared GSI might be able to alter the GSI and diminish its drainage fee credit value. In the example above, though Zell’s would not be bound by the various terms of the original ABC-WU-CH contract, a good restrictive covenant would at a minimum prohibit Zell’s from altering its property in a way that jeopardizes the credits.

A parcel owner must record her restrictive covenant so that it “runs with the land,” which is the legal way of saying that it will apply to her and to future owners of the parcel. To “record” a property instrument is to file it in a place that makes property interests publicly accessible. In Detroit, parcel owners record their covenants at the Wayne County Register of Deeds. Once there is a valid recorded covenant that addresses shared GSI, the other parcel owners benefiting from shared GSI, as well as their successors (future owners of the parcel), can enforce the covenant, which means that they can sue to address any violation of it.

In the context of shared GSI, one should consider describing the following in the covenant:
- the size of the GSI
- why the GSI cannot be altered so as to diminish its ability to perform the intended stormwater management functions
- how the GSI affects the drainage fee
- which other parcels are benefiting from it
- how and when it expires (or if it should last in perpetuity unless later amended)
- who can enforce it
- under what circumstances future owners can modify it

If the GSI is located on some parcels but not others, there are two options. The first option is for the parcel owners hosting the GSI to record covenants that make it clear that other parcels not hosting the GSI are part of the overall shared GSI scheme and benefit from it. That makes it easier for the non-GSI-hosting parcel owners to pass on the drainage credit benefits to their successors, including the ability to sue the other parcel owners if they are violating the covenant by jeopardizing the shared GSI. The second option is for all the shared GSI participants to record covenants. In that case, the non-GSI-hosting parcel owners would record covenants that describe the shared GSI scheme and restrict the owners from altering their property in ways that would negatively affect it.

The main takeaway is that, while the terms of the original shared GSI contract would by default be inapplicable to future owners, restrictive covenants can take one very important contractual provision, namely the prohibition against jeopardizing the credits by materially altering the property, and apply it to future parcel owners through the use of property rights.

EASEMENTS AND LICENSES

Easements and licenses give one person the right to use the property of another in a specified way. Unless they decide to purchase the property, when shared GSI participants decide to invest in GSI on public property, they will need to obtain an easement or a license from the public entity that owns it.

Easements and licenses differ in several important ways. Easements are actual legal interests in land, whereas licenses simply provide permission to use property. It is easier to unilaterally end a license than an easement. One must record an easement in the county deeds office for it to be valid but need not record a license. Easements are transferable, whereas licenses by default are not.

Whether shared GSI participants can or should obtain an easement or a license, and what terms they can agree to, will be the subject of negotiation between them and the public entity that owns the parcel that will host the GSI. Whatever the circumstances, shared GSI participants should try to ensure that they obtain the ability to place GSI on another’s property in a way that is transferable to their successors, that protects the GSI from being altered in a way that diminishes its function of earning credits, and that does not terminate until they obtain a return on investment.
OTHER LEGAL CONSIDERATIONS

LANDLORD-TENANT

Landlords and tenants address the payment for drainage fee in various ways. Since the fee is tied to parcel ownership, it is landlords who are initially responsible. Landlords who recover part or all of the fee from tenants can either raise rent, or have the tenant pay the fee as distinct from the rent, or have the fee assigned to the tenant in a manner that satisfies DWSD’s criteria for such fee assignment. In terms of shared GSI, it will always be simplest if landlords are willing participants even if the tenants are the driving force behind the changes. Where a landlord wants to participate in a shared GSI scheme without the involvement of tenants, that is relatively simple since the landlord owns the parcel, though landlords may need to review lease agreements to determine whether the shared GSI will require modifications.

LIABILITY FOR HARM

The risk of harm caused by shared GSI arises in at least three contexts. First, paid or volunteer organizations performing O&M may be injured during that process. Second, people who enter a space with shared GSI – whether invited or not – may become injured. Third, the runoff from the shared GSI could violate a stormwater pollution control requirement or some other law.

It is not possible to quantify these risks or to say that managing them is a necessity. Depending on one’s risk tolerance, there are various ways to manage these risks and others like them.

As to shared GSI construction and O&M or legal violations associated with runoff, the best way to manage risk is to develop a contract for the service and to address injury in that contract. In the section above on contracts, there is a description of how to do this through indemnification. The contract can also ask anyone performing O&M services to waive or restrict the shared GSI participants’ liability in the event of certain kinds of injuries.

As to people who enter the shared GSI property with or without permission, the law is complex because it differentiates between trespassers; those with a right to be on property, and those expressly invited to enter property. Very basically, though, if there is an intention to have members of the public enter the shared GSI, or if it is located in such a way that entry by the public is possible, then appropriate signage is among the best ways to inform visitors of any risk and therefore manage participants’ liability. Shared GSI participants who are commercial property owners should also check with their general liability and commercial property insurance carriers to identify applicable coverage.

PRIVATE ALLEYS

Alleys in Detroit can be private or public. Public alleys can become private through a process called “vacating”. Even when they are privately owned, ownership will likely be burdened by easements for utilities and public passage, meaning that the private owners of an alley may still need to allow it to be used by utilities (sewage, gas, electric, etc.) and by members of the public who simply want to use it to get from one place to another.

Alleys matter in the context of shared GSI in many ways:

- When they are privately owned, alleys will increase the amount of impervious area used to calculate a parcel owner’s drainage fee.3
- Public alleys can generate stormwater. Shared GSI can manage that stormwater and, under certain circumstances, can help shared GSI participants earn more credits.
- There may be a desire to convert an alley from impervious road surface to pervious surface, by using pervious pavement for example.
- Alleys can act as a conduit conveying stormwater generated on certain parcels towards shared GSI located on others.

There are a couple main takeaways. First, participants will need an easement or license from the city to install a shared GSI practice in a public alley. Participants will also need to obtain a construction permit and right of entry permit from the city and possibly others. Second, in general, any physical improvement to either a public or a private alley will be expensive since, apart from the capital costs, it may require various approvals, property instruments, and legal agreements. The more that a shared GSI scheme can manage the stormwater generated from an alley or use an alley to simply convey stormwater to shared GSI, the lower the legal and regulatory costs will be.

3 Portions of a public alley that are occupied by a parcel owner are also part of the overall impervious area used to calculated that owner’s drainage fee. See the Drainage Charge Manual: A Guide To The Drainage Charge at page 4.
MAINTENANCE NEEDS
Prepared by OHM Advisors

Routine maintenance associated with Green Stormwater Infrastructure (GSI) is critical to success of individual practices, specifically those that rely on infiltration. Each of these practices rely on a clean interface that allows surface runoff to be transmitted to underlying soils. With this in mind, local government agencies with interests in GSI have developed suggested maintenance for various types of GSI as well as conventional stormwater infrastructure. These can be found within the Low Impact Development Manual (Southeast Michigan Council of Governments, 2008), Drainage Starter Guides (Detroit Water and Sewerage Department, 2017) and Wayne County Department of Environment Stormwater Standards (Wayne County Department of Environment, 2015).

Generally, DWSD’s GSI starter guides provide basic maintenance considerations for each practice. This includes periodic inspection, debris removal, sediment cleaning, and inspection requirements for credit recertification every three years. SEMCOG’s Low Impact Development (LID) Manual expands on these maintenance strategies and includes a maintenance checklist per each practice type. These two resources provide sound strategies that can be executed by property owners and contractors to ensure GSI remains effective on a given site.

PROVISIONS FOR SUCCESSFUL SHARED GSI
With shared GSI, there are additional considerations that property owners should be mindful of beyond those found in the above-cited resources. This is noted because the function and safety of individual properties can be adversely affected by maintenance deficiencies on an adjacent property within the shared practice area. To help guard against this, it is recommended that a maintenance plan is developed for each shared practice area. The plan should be documented and agreed upon by all property owners within the shared practice area. The plan should generally include the following:

1. A site plan showing each shared practice, the contributing drainage area and any conveyance (sewer pipes, swales, ditches, culverts) that connect a property to the shared practice.

2. A tabular summary of all property owners participating in the shared practice area. If multiple practices exist but only benefit certain properties, this shall also be documented.

3. A specific maintenance schedule shall be developed for each practice (It is suggested to use the SEMCOG LID manual checklists as a template). The maintenance schedule shall be agreed upon by all property owners participating in the practice.

4. Separate maintenance schedules shall be developed for any shared conveyance measures or conveyance that passes over adjacent properties. It is recommended that the Wayne County Stormwater Standards Manual is utilized for this.

5. After construction, all maintenance activity should be documented with cost and maintenance logs maintained.

6. A designated contact shall be established for the shared practice area that maintains the maintenance records, is responsible for recertification and can be used as a contact in the event of a maintenance concern.

PROPERTY OWNER PREFERENCE-DRIVEN MAINTENANCE CONSIDERATIONS
Beyond agreement between property owners on maintenance activities and responsibility, there should also be consensus on other owner issues:

Aesthetics
GSI practices commonly utilize native plantings that can at times be perceived as inconsistent with traditional landscapes of existing property. Often, these plants can grow to heights that exceed eye level and appear to some as unkempt compared to manicured turf grass. While vigorous growth is the sign of a successful GSI practice, it also can stoke a wide range of impressions from property owners. Prior to selecting plants and practices and determining maintenance, it is worthwhile to set expectations and parameters on when maintenance is to occur. This can be defined simply as growth height which provides a measurable point at which time maintenance should occur.

Access
Certain GSI practices will require maintenance that includes the use of certain equipment that can include trucks and small excavators. In some instances, this equipment may traverse onto adjacent property. It is important that all property owners agree to an access pathway and commit to maintaining a means of ingress/egress. This includes ensuring that structures, vegetation, stored materials and other objects are not placed within the route.
IMPLEMENTATION TIPS

Agencies within the City of Detroit have worked collaboratively in the past few years to identify changes necessary within codes, ordinances and standards to accommodate GSI. The changes require thoughtful discussion and analysis. In some instances like road agencies, the notion of introducing water to underlying soils is counter to the goals of good pavement design. This is even expressed by DWSD where GSI is not permitted over sewer lines due to the likelihood of increased inflow and infiltration into pipes. Still, most affected agencies have recognized on a policy level that the goal of reducing the speed and volume of flow to the DWSD sewer system serves the greater public good from an environmental and financial perspective. As shared GSI concepts move closer to installation, stakeholders will need to facilitate discussions with key agencies to determine processes and policy changes that allow for implementation of GSI within public right of way and multiple properties.

AGENCY IMPEDIMENTS

The construction of shared green stormwater infrastructure within the City of Detroit can involve any number or combination of government agencies, utilities and private property owners. A separate set of standards comes with each of these entities. In some cases, the standards in place either limit or challenge GSI implementation. A summary of these is shown below.

Jurisdictions within the City of Detroit

<table>
<thead>
<tr>
<th>Location</th>
<th>Permitting Agency</th>
<th>Referenced Code, Standards or Ordinance</th>
<th>GSI Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Property</td>
<td>City of Detroit Building, Safety, Engineering, Environmental Department (BSEED)</td>
<td>Plumbing Code</td>
<td>Yes with engineer’s certification of alternative engineered solution</td>
</tr>
<tr>
<td>City Streets</td>
<td>City Engineering Division – Department of Public Works</td>
<td>Street and Alley Standards</td>
<td>Yes with Maintenance Agreements.</td>
</tr>
<tr>
<td>City Alleys</td>
<td>City Engineering Division – Department of Public Works</td>
<td>Street and Alley Standards</td>
<td>Yes with Maintenance Agreements. Not permitted above DWSD sewers</td>
</tr>
<tr>
<td>Vacated Alleys (With Utility Easements Remaining)</td>
<td>Franchise Utilities</td>
<td>Conditions as defined by easements</td>
<td>DWSD: Infiltrative practices are not currently permitted above existing sewers</td>
</tr>
<tr>
<td>County Roads (Various Segments)</td>
<td>Wayne County Department of Public Services</td>
<td>Wayne County Storm Water Ordinance, Wayne County Construction Permit Standards</td>
<td>Unknown.</td>
</tr>
</tbody>
</table>

SPECIAL NEEDS AND POSSIBLE POLICY CHANGES

Building, Safety, Engineering, and Environmental Department (BSEED). Currently, BSEED requires that runoff is managed through use of continuously connected gutters and sewer connections. BSEED has indicated that it will accept infiltration practices in lieu of these connections, however they require sign off from a professional engineer. This generally requires onsite soil testing. Other concepts that may require additional review from BSEED includes routing of stormwater from one parcel to another. A formal agreement between property owners is typically the best method to accomplish this.

DWSD – Construction over Sewers

Currently infiltration practices are not permitted within areas above DWSD sewers. The reasons noted are related to concerns of inflow and infiltration into pipes. This policy becomes problematic in alley areas. These areas often serve as low areas adjacent to businesses and parking lots that offer attractive locations for cost effective GSI practices. However, these alleys almost always contain public sewer, which eliminates alleys from consideration.

City Engineering Division – Department of Public Works

Construction of green stormwater infrastructure along with associated structures and sewers is currently prohibited within public rights of way (City of Detroit Roads and Alleys) unless a separate maintenance agreement is prepared. While maintenance agreements can be obtained through normal City processes, the specialties required to obtain them along with the added cost burden to private property owners can be a deterrent. Developing a city process that standardizes acceptable construction techniques and more simply delineates maintenance responsibility can be a positive method to allow for GSI practices in certain City rights of way.

RESOURCES


20 QUESTIONS FOR YOUR CONTRACTOR
Prepared by Fa Foen

INTRODUCTION & TIPS
When preparing for any project that will affect the physical structure of a building or landscape, safety and security are critical. Your project may require a variety of professional expertise, such as an engineer (e.g., civil, building) or licensed contractor. Once you determine the goals and outcomes for your project, you may find yourself working directly with a contractor. Depending on how big or complex your project is, you may work with an engineer first. In any situation, working with licensed and insured professionals, with a good reputation and track record of similar projects, is a good start to a good project.

Educate yourself on the work you think you need done. Do some research online, and ask knowledgeable folks, including friends, neighbors, service agencies, or your local government officials. Be prepared to provide background information on the project site, how soon the project needs to be constructed (4 weeks, next season, next year, 3 years?), who the decision makers are for the project, and what your role is. When speaking with a contractor, you can let them know if you are asking questions to create a project budget for fundraising. They may provide useful insight. In the end, you should feel like you and the contractor are on the same team. Also, get familiar with how much your project might cost. If this is your first time working on a project like this, include big picture budgeting in your research. Be prepared to adjust costs as you learn from contractors and suppliers. Also, be prepared to talk to multiple contractors and obtain estimates from 3 different contractors.

BASIC QUALIFICATIONS
1. What are examples of similar projects you have done?
  a. Professionals should be able to provide pictures of completed projects (bonus if you can visit the project), general project costs, and project referrals. A company website and Facebook page are great resources as well.
2. Can you provide client referrals?
3. Are you licensed and insured? Are your employees covered by workers’ compensation?
4. Can you provide a Certificate of Insurance and W9?  
   a. If you represent a business, non-profit or religious institution, you should also request these documents.
5. How many years have you been in business?
6. Have you worked in the City of Detroit?

PROJECT TEAM
7. How many full-time staff members do you have and what are their certifications?
   a. Example: Are you, or anyone on your staff, permeable interlocking concrete pavement certified? (PICP). Or is anyone on staff a certified “pervious concrete technician, craftsman or installer”?

8. How big is your fleet? (i.e., vehicles, motorized equipment)
9. What kind of equipment do you typically use? Would you use for this type of project?
   a. Shovel and a wheelbarrow vs.
   b. Mini-excavator, ditch witch vs.
   c. Excavator, bulldozer, etc.
   d. Specialized: mechanical layer, mechanical screed
10. Do you typically act as the General Contractor? For our type of contract, would there need to be a need for a separate Site Contractor? How much of this work could you do in house?
11. What types of subcontractors do you typically hire out?
   a. Examples: Earthmoving, concrete/flatwork asphalt, plant selection and install, irrigation, etc.
   b. If so, how is their insurance handled?

GREEN STORMWATER INFRASTRUCTURE
12. Have you installed Green Stormwater Infrastructure practices?
   a. Which do you specialize in? (Permeable surface, bioretention, etc.)
   b. If bioretention:
      i. Can you specify native plants? Have you worked with local suppliers?
      ii. Are you familiar with invasive species management practices?
      iii. Can you give an example on how your company manages weeds once GSI is installed?
      iv. What other native plant projects have you worked on in the area?
      v. Can you give us an idea of how much maintenance is needed?
   c. If permeable pavers, concrete or asphalt:
      i. Can you explain how this type of GSI should be maintained?
      ii. What type of aggregate should be used in these types of projects?
13. Are you familiar with DWSD’s drainage charge and the different steps to addressing it?

PROCESS & TIMELINE
14. What is your project process?
15. Will this project require permits?
   a. Are you familiar with the permitting process in Detroit?
16. Can you follow construction plans and specifications for [insert green infrastructure type]?
17. Would you stay on this project until completion? Who would be the primary contact on this project?
18. How soon can you provide a cost estimate and what else do you need from us?
19. Can you provide a written guarantee for this project?
   a. Are there separate warranties for plants vs. hardscaping?
   b. What is the industry standard and how much does this include in the cost?
20. If awarded the project, when can this project take place? How soon can you start? How long will installation take?

A list of contractors who have been through a GSI training program is available on the DWSD website: http://detroitmi.gov/Government/Departments-and-Agencies/Water-and-Sewerage-Department/Learn-About-Drainage-Credits#starterguides
FINANCIAL MODELING FOR OWNERS, CDCS & DWSD
Prepared by Zachary & Associates, Inc.

EXECUTIVE SUMMARY

INTRODUCTION
Green Stormwater Infrastructure (GSI) remains a financial challenge for many property owners despite the potential to mitigate the drainage charge with GSI practices. This section focuses on financial strategies for a variety of property owner types and DWSD, including scenarios for non-profit and for-profit owners. For-profit property owners comprise the many businesses that make up Detroit’s commercial corridors. Non-profit organizations include community development corporations, faith-based institutions, and some schools. Common elements for both ownership types are the challenge of meeting the financial obligation of the drainage charge and the need for assistance navigating financial strategies for installing GSI. Recommendations included here address the needs of property owners, the role of non-profit organizations as both rate payers and fiduciaries, strategies for shared financing structures, and recommendations to DWSD for supporting customers installing GSI.

OBJECTIVES
This section aims to provide equitable financial strategies for property owners, non-profit organizations, and DWSD for the installation of GSI. Recommended solutions should result in reduced expenses for property owners and benefits to DWSD in terms of reduced impact on the combined sewer system.

STRATEGY
To achieve equitable financial strategies for all parties, a creative approach is needed. This includes leveraging mechanisms not traditionally applied to GSI and blending sources of money to increase usability. DWSD coordination with financial institutions to streamline lending, billing, credit and verification mechanisms will enable more building owners to participate.

CHALLENGES
Across all categories of property owners, the largest challenge in developing a GSI system is balancing the cost of installation, including maintenance, with drainage credits that offset the debt-service for a quicker return on investment (ROI). In Michigan, the nascent market for financing green stormwater infrastructure does not recognize a high value for GSI nor offer many incentives or support to balance repayment of loans. Additionally, most property owners are usually burdened by existing debt and faced with critical capital improvements placing GSI as a low priority for undertaking additional debt. These challenges can be mitigated through the orchestration of innovative solutions that coordinate GSI financing with credits and bill payment through a single source system supported by DWSD.

Financing structures can be tested with a Return on Investment (ROI) Calculator that can be adjusted by performance criteria.

Appendices include the ROI Calculator, summaries of funding mechanisms, and related case studies.

RECOMMENDATIONS
Following extensive research of funding mechanisms and case studies, few models for private investment in GSI were found in Michigan; however, a model for financing energy-efficiency improvements can best illustrate how savings can support debt. Private lending institutions are typically unable to reduce underwriting principles or offer interest-rate reductions for public benefit. Additional challenges are presented when combining several property owners under one financial structure. Therefore it is recommended that individual financing be pursued proportionate to combined costs and credits. Regardless, a new financing mechanism is essential for reducing the financial burden of additional debt to assist building owners with developing effective GSI systems.

MECHANISMS
Several financial mechanisms are recommended for consideration.

AUTHORITIES
An authority is a regulating body that oversees requirements and has the legal ability to give orders, make decisions, and enforce compliance. An authority also has the ability to levy and collect assessments, acquire, maintain, and dispose of property, construct structures, borrow money, and cooperate with towns, cities, counties, state, and federal agencies on behalf of constituents. Authorities are comprised of a board of directors that vary by number. Examples in Detroit include the Tax Increment Finance Authority whose purview is TIF districts and the Detroit Wayne County Port Authority.

GRANTS
Grants are non-repayable funds or services received by one party from another. Typically the receiving party is required to maintain a tax-exempt status as a 501(c)(3) organization and the distributor is often a governmental entity or foundation. Many grants are program specific, such as for GSI or water quality.

INCENTIVES
Incentives may motivate property owners to undertake capital expenditures such as GSI by helping overcome financial barriers with other benefits. Incentives may include tangible assets not directly related to GSI such as parking variances or partnerships for operating and maintaining GSI conducted by a third party as part of an agreement.

LENDING
Lending supports individual property owners or organizations with the intention of the financial contribution being returned, with an expected interest payment determined by the terms of the agreement. Most often lending requires collateral such as property or a personal guarantee and, depending on the use of the loan and source of funds, will vary in length of years for repayment.
Mechanism Compatibility

Many of the financing mechanisms that support GSI can be used in combination with each other depending upon the users. As illustrated in the Green Stormwater Infrastructure Funding Mechanism Compatibility chart on the next page, some of the mechanisms work better together than others as indicated with preferred and applicable uses.

For-profit property owners are typically reliant on lending practices. Differences between lending options are based upon the source of the money and associated interest rates and loan terms. Being in an organized commercial corridor has many benefits for private property owners, namely that they can utilize tax capture financing in the form of either a BID, CIA, TIF, or TRA if such a mechanism is in place. These tools address GSI on a district scale and can be structured to reimburse the cost of installation.

Grants are most applicable for non-profit organizations installing GSI systems. Due to their legal structure, a 501(c)(3) organization may be eligible to receive grant funding that does not require repayment. The main challenge is finding GSI implementation grants that do not compete with programmatic grants that non-profit organizations rely on for providing services. In addition to installing GSI on their own properties, non-profit organizations play a critical role in assisting other property owners to install GSI systems. They can contribute to the dissemination of information and act as a fiduciary to for-profit property owners by providing development support of programs that unify a district or commercial corridor.

DWSD’s role can be both the assembler and disseminator; as they are capable of working with foundations and bonding agencies to establish a revolving loan fund for on-bill financing. This role is unique in that they are the only entity capable of providing a lending structure most similar to traditional lending despite the challenges associated with it. Through partnerships and support from the City of Detroit and the quasi-governmental agencies such as the Detroit Economic Growth Corporation (DEGC), bonding and underwriting can be used to combine funding streams and make them more accessible to both for-profit and non-profit property owners.
AGGREGATING MECHANISMS
The use of financial mechanisms varies among different property owners, largely depending upon the legal structure of the entity. Following are examples of how mechanisms might be aggregated for maximum financial benefit.

FOR-PROFIT PROPERTY OWNERS

DWSD | CAPITAL PARTNERSHIP PROGRAM
This is a critical source of matching funds for property owners who have been paying the drainage fee the longest.

DEVELOPMENT INCENTIVES
Creating allowances such as reduced parking requirements for the trade-off of space to install GSI would benefit property owners who have limited ability to manage stormwater on site. Additional incentives could include variances for use of public right of way.

ON-BILL FINANCING
On-bill financing provides a lending source that accounts for the collateral limitations of GSI and aggregates funding that would otherwise not be available to private property owners.

ON-BILL REPAYMENT
On-bill repayment provides a third party lender a surety of repayment as it is attached to the water bill that remains with the property.

PACE | PROPERTY ASSESSED CLEAN ENERGY
PACE financing remains with the property as an itemization on the property taxes, ensuring the repayment regardless of ownership.

REVOLVING LOAN FUND
A revolving loan fund provides a wider aggregation of sources of funding that would not otherwise be available to individual property owners. This could be made available at favorable interest rates or forgivable over time.

NON-PROFIT ORGANIZATIONS/COMMUNITY DEVELOPMENT CORPORATIONS

BID | BUSINESS IMPROVEMENT DISTRICT
Applicable to organized business districts, BID revenue could be directed to GSI either explicitly for shared practices or included in best practices for other district improvements such as planters and beautification efforts.

CIA | CORRIDOR IMPROVEMENT AUTHORITY
CIAs provide the ability to collect tax increments and apply for alternative funding sources such as bonds and grants.

TIF | TAX INCREMENT FINANCING
Most applicable for existing districts, TIF amendments could be drafted to prioritize shared GSI. Limitations include the restriction of initiating two districts per municipality annually and a wide array of competing eligible expenses. However, GSI is a 100% reimbursable expense within a TIF district.

TRA | TARGETED REDEVELOPMENT AREA
TRAs are geared toward large areas (40-500 parcels) with a collective interest in GSI. This structure requires an increase in taxes to reimburse GSI.

DWSD | DETROIT WATER AND SEWERAGE DEPARTMENT

FOUNDATIONS
Foundations could provide support to DWSD through the infusion of capital for a revolving loan fund.

GOVERNMENT
Similarly, government funding from different levels can provide support to DWSD through the infusion of capital for a revolving loan fund.

LAND ACQUISITION TAX/MILLAGE
A county-wide tax to acquire land specifically set aside for management of stormwater, this strategy would be most applicable within a floodplain or adjacent to a large property that otherwise cannot manage stormwater.

FOUNDATION PRI | PROGRAM RELATED INVESTMENT
PRIs are short term infusions of capital to a revolving loan fund to be repaid at a low interest rate passed onto property owners or renewed for sustained allocation to GSI projects.

GOVERNMENT BONDS
In conjunction with the Great Lakes Water Authority (GLWA), bonds can contribute to aggregated funding for DWSD-led projects or individual property owner-led projects financed on-bill.

CITY

STBG | SURFACE TRANSPORTATION BLOCK GRANT
This grant provides an opportunity to utilize a non-GSI specific funding mechanism to meet additional needs beyond its intended scope through the inclusion of best practices of managing stormwater.
RECOMMENDED FINANCIAL STRATEGIES

Few models for private investment in GSI were found in Michigan; however, a model for financing energy-efficiency improvements best illustrates how savings can support debt. Additionally, private lending institutions are typically unable to reduce underwriting principles or offer interest-rate reductions for public benefit, such as offered through GSI, thus a new financing mechanism coordinated with City and philanthropic institutions would be best suited for this challenge. The primary recommendation is the creation of a revolving loan pool available through on-bill financing. This solution resolves the limitations of conventional financing and assembles the financial resources supporting GSI to one source, reducing complexity. It is recommended that DWSD partner with an underwriting agency such as the DEGC to establish the revolving loan fund and to assist with the management of funds. Furthermore, to increase the attractiveness for property owners to pursue GSI incentives outside the scope of reduced drainage fees are encouraged. These may encompass development incentives of fast-tracking, zoning variances, and support for operation and maintenance.

Below are the recommended strategies for DSWD to consider for creating an innovative method to allow building owners to offset their current drainage charge with a loan that covers capital expenses for installing GSI and results in a drainage credit.

1. ON-BILL FINANCING

On-bill financing places the cost of loan repayment for installing GSI on the existing water bill. The objectives are a monthly loan repayment lower than the anticipated drainage credit, overall reduction in the bill, and a positive return on investment for property owners in the long run. It is recommended that DWSD partner with an underwriting agency such as Detroit Economic Growth Corporation DEGC for administrative purposes. This financing option would require orchestration with the DWSD billing department and procurement of loan funds with foundations and the City.

+ Mitigates the need for third party lenders who do not service this type of loan
+ Is attached to the water bill providing leverage and ease for collection of payment
+ GSI improvements remain with the property
- Requires restructuring of water bill and cooperation of billing department

2. AGGREGATED REVOLVING LOAN FUND

Combines a variety of funding sources together for more expansive reach and reduces the cost of financing. A low percentage loan ensures the perpetuity of the source for reallocation. Establishing the revolving loan fund as part of on-bill financing increases its accessibility for property owners.

+ Leverages philanthropic support to reach both non-profit and for-profit property owners
+ Utilizes bonding capacity of the City
+ Is a regenerative loan pool
- Requires underwriting

3. DEVELOPMENT INCENTIVES

Development incentive are advantages that property owners may realize in forms other than a reduced drainage charge such as allowances within codes (i.e. parking variance), expedited permitting at the City, and/or reduced GSI operation and maintenance cost through programs sanctioned by DWSD that support green job training.

+ More expedient and tangible value for property owners
+ Encourages property owners to install GSI amidst other development challenges
+ Provides support for property owners in long term maintenance
- Does not reduce the expense associated with the drainage charge or the costs of GSI

The primary recommendation is the creation of a revolving loan fund for GSI available to property owners through on-bill financing.
Recommendations: Detroit Water and Sewerage Department

DWSD’s role in financing GSI projects is vital to the success of installations as traditional loan and financing options are not readily available to many property owners. DWSD should partner with the DEGC to establish a revolving loan fund comprised of investments from banks, bonds, foundation program related investments (PRIs), and philanthropic grants. This will serve as the source of funds for individual property owners to borrow against and receive forgivable loans.

An on-bill repayment program between DWSD and DEGC would provide the ability for property owners to pay for the GSI system on their water bill. The advantages of combining the costs of the GSI system with the existing water bill are that the lender, in this case DEGC, understands the atypical nature of financing GSI and is able to mitigate their risks in partnership with DWSD. This method also is more convenient for property owners by streamlining the process of financing rather than navigating more traditional sources.

For property owners, the loan repayment for GSI will be included on their bill and their drainage charge will be reduced through credits associated with the GSI. To incentivize customers to install GSI, a combination of grants and low-interest long-term loans will help ensure that the monthly loan repayment for the cost of the GSI installation is less than the drainage credit and their bill is lower overall. Additional incentives such as assistance with operation and maintenance expenses would also encourage property owners to install GSI.

Challenges:

• Coordinating with the DEGC for underwriting GSI projects
• Aggregation of revolving loan funds
• Marketing to customers
• Ensuring that customers’ bills are lowered

Opportunities:

• Increase the amount of green infrastructure across the city and contribute to development viability
• Provide low interest loans and grants to property owners
• Expand the program to incorporate job training for green trades such as installation, landscaping, operation and maintenance

Concerns:

• Limited resources available for the revolving loan fund
• The length of time to realize the return on investment for property owners
• The loan agreement should remain with the property, similarly to Property Assessed Clean Energy (PACE) Program

Recommended Financing Structure for DWSD, For-Profit Property Owners and Nonprofits

#1 On-bill Financing and Revolving Loan Fund

On-bill financing with a revolving loan fund could be housed at the DEGC. Possible sources of funds could include bonds, foundation PRIs, and philanthropic grants to assemble both the loan pool and retain a loan loss reserve. The revolving loan fund could be combined with DWSD Capital Partnership Program up to $50,000 to provide loan equity. The property owner receiving credit would pay back the loan with their water bill to DWSD. DWSD would then forward the money collected for the revolving loan fund to DEGC. The repayment of loans secured by water bill collection would perpetuate its existence to be able to support more GSI projects in the future. This model is also the preferred recommendation for for-profit and non-profit property owners.
**RECOMMENDATIONS: FOR-PROFIT PROPERTY OWNERS**

Financing for GSI is not a property improvement that lenders are accustomed to financing as it does not fit the traditional model containing collateral.

The most conducive model for private property owners [#1 On-Bill Financing] is contingent on DWSD establishing a revolving loan fund. This option would allow property owners to repay the costs of installing GSI on their property on their water bill, which will also reflect drainage credits associated with the GSI. As a result, the property owner gains the additional value of the GSI and contributes to decreasing the strain on the combined sewer system. This model closely resembles energy efficient programs for home improvements.

The second model [#2 Traditional Financing] relies on private financing on the property owners’ behalf. This includes using private equity and loans. A financial calculator has been developed to determine ROI, including the cost of financing and long term operation and maintenance expenses, included in an appendix to this report.

**CHALLENGES:**
- Property owner familiarity with GSI
- Ability to finance the project
- Lack of financial institutions familiar with GSI
- Limited collateral for financial institutions
- Complexity of sources of funding
- Continued cost of operation and maintenance

**OPPORTUNITIES:**
- Contribution to community beautification
- Increased property value
- Private property owners could benefit from philanthropic support through revolving loan fund and on-bill financing

**CONCERNS:**
- Possible change in the drainage charge rate
- Guarantee of credit renewal
- Future development of GSI site

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**RECOMMENDATIONS: NON-PROFIT ORGANIZATIONS/COMMUNITY DEVELOPMENT CORPORATIONS**

Non-profit organizations including religious institutions, some schools, and community development corporations are faced with the drainage charge associated with their own properties and also with aiding the communities they serve.

To manage stormwater on their properties, non-profit organizations can more easily apply for grants and philanthropic support. The most accessible model [#3 Philanthropic Model] for non-profit organizations seeking to install GSI is through grants and volunteer support. Grants could also supplement on-bill financing and a revolving loan fund [#1 On-Bill Financing]. Both options utilize the financial contributions of philanthropic support by reducing the financial obligation of loan repayment on the monthly water bill by reducing the initial amount funded through the on-bill financing program. The last option for non-profit organizations would be traditional lending [#2 Traditional Financing] as illustrated with for-profit property owners. This option is least conducive for non-profit organizations as they lack the revenue to support traditional lending and typically rely on philanthropic support or fundraising for mission-oriented initiatives.

**Challenges:**
- Familiarity with GSI
- Ability to finance the project
- Lack of financial institutions familiar with GSI
- Limited collateral for financial institutions
- Complexity of sources of funding
- Continued cost of operation and maintenance

**Opportunities:**
- Contribution to community beautification
- Increased property value
- Private property owners could benefit from revolving loan fund and on-bill financing

**Concerns:**
- Possible change in the drainage charge rate
- Guarantee of credit renewal
- Future development of GSI site

---

The primary recommendation for DWSD, property owners and nonprofits alike is #1 On-bill Financing and Revolving Loan Fund, illustrated on page 63.
RECOMMENDATIONS: PRIVATE PROPERTY OWNERS + NON-PROFITS/COMMUNITY DEVELOPMENT CORPORATIONS

Coordinated projects at the district scale are possible for for-profit property owners and non-profit organizations/community development corporations to work together to install GSI. Model #4: For-profit Property Owners + CDCs illustrates how a commercial corridor could create a district-wide plan for implementing GSI and receiving collective financial benefits. Initiating a Tax Increment Financing (TIF) district is a critical first step. A TIF collects the increase of property values that are realized through redevelopment. The captured taxes are collected from the district and reallocated as reimbursements for eligible GSI expenses identified in the plan. The portion of the project that property owners finance is also reimbursable. The only exclusion is the portion of the project financed with grant money.

This model, though the most complex, is the most advantageous for property owners as it utilizes the tax increase for reimbursement of improvements that property owners make toward the greater good of the city and combined sewer system, and reduces the final cost of the GSI system they invest in. The ROI is greatly improved in this model as it ensures that the property owner recovers their initial investment outside of the annual cost reductions realized with the drainage fee credits.

CHALLENGES:
• Creation of the TIF district (or other similar enacted authority)
• Time for the district to accrue revenue from taxes for reimbursement
• Difficulty quantifying the value of GSI with the sale of a property

OPPORTUNITIES:
• Establishment of district-wide identity featuring GSI/sustainability
• Shared systems at a district-wide scale
• GSI remains with the property and water bill
• District-wide coordination for operations and maintenance

CONCERNS:
• The district-wide plan must be specific to GSI rather than encompass all eligible activities
• Establishing a fair and equitable reimbursement schedule among property owners

#4: For-profit Property Owner + CDC with TIF

- DWSD On-bill Financing
  - ROLE: Add line item to existing bill
  - Practice approval
  - Credit allocation

- Revolving Loan Fund
  - ROLE: House the revolving loan fund
  - Underwriting
  - Manages fund

- DWSD 50/50 Capital Partnership
  - ROLE: Drafting of Plan

- Property Owner
  - Equity

- CDC
  - TIF reimbursement

- GSI Project
ONLINE APPENDICES

GSI Benefits by Practice
Conceptual Cost Estimates
Stormwater Calculation Methodology
Legal Memos
Return on Investment Calculator
Financing Case Studies
Summaries of Financial Tools
Vegetation Credits
Lessons from the West Village Green Alley Project
Detroit GSI Resource Guide
Detroit GSI Directory

WWW.DCDC-UDM.ORG/COMMUNITY/STORMWATER.HTML