GREEN STORMWATER INFRASTRUCTURE

PLANNER'S PORTFOLIO

ISSUE 6

AUGUST 2016

delaware county planning department

PLANNER'S PORTFOLIO
GREEN INFRASTRUCTURE

1 OVERVIEW

2 MATURE NEIGHBORHOODS

4 GROWING SUBURBS

6 CENTRAL PLACES

8 ACTIVITY CORRIDORS

Planner's Portfolio Series

The Planner's Portfolio Series is an outreach effort developed by Delaware County Council in order to explore the planning concepts available for communities to take advantage of the unique opportunities across Delaware County.

The pattern on the cover page, and found throughout this series, represents the importance of each individual component in the larger network. The Planner's Portfolio Series explores several of these components and how they can support community character in Delaware County.

For more information, contact the Delaware County Planning Department at 610-891-5200 or visit www.co.delaware.pa.us/planning to see the complete Planner's Portfolio series.

OVERVIEW

Green Stormwater Infrastructure (GSI) utilizes landscaped areas to address stormwater runoff. It is a cost-effective approach to manage the impacts of stormwater by directing it away from municipal stormwater systems and into vegetated areas that are designed to infiltrate, or absorb, the runoff.

GSI can range from natural areas to highly engineered solutions that increase on-site infiltration. The amount of stormwater that GSI can manage varies depending on the method implemented. GSI offers a range of benefits beyond stormwater management and can contribute to the beautification and regreening of an area while also increasing pedestrian safety along roadways. Many public works projects, such as new streetscapes, offer a great opportunity to incorporate GSI into their community as a part of other, ongoing improvement efforts.

Note: the green stormwater infrastructure technologies shown for the following character areas are often interchangeable and/or combinable on varying scales.

Philadelphia Water Department, Green Streets Design Manual

MATURE NEIGHBORHOODS

The Mature Neighborhoods of Delaware County were built prior to the enactment of many stormwater regulations that shape development today. As such, many of these areas were designed to get stormwater off the site and into a stream as quickly as possible. Unfortunately, the resulting influx of water into the streams contributes to downstream flooding and water quality problems. Therefore, it is important to consider retrofitting existing sites to infiltrate and treat more stormwater on sites with stormwater management best practices.

Mature Neighborhoods often have smaller lot sizes, which will require creativity to integrate green stormwater infrastructure into the design of the site. This is often accomplished through rain gardens that replace typical parking islands or disconnecting down spouts and redirecting the runoff.

Lawrenceville, GA

Precision Planning, Inc.

Norwood Borough, PA

Infiltrating stormwater onsite, particularly adjacent to parking lots (above), helps to reduce flooding and water quality problems. A properly designed rain garden can easily infiltrate the full amount of stormwater generated by a site from typical rain events. Smaller planted areas in public spaces, such as along sidewalks (left), contribute to the beautification of a corridor while also reducing stormwater runoff.

In the past, street specifications often required unnecessarily wide streets. More recently, studies show that narrower street widths can accommodate local traffic volumes and parking while also calming traffic. By modifying side streets to be narrower, long-term repaving and maintenance costs are lowered and the reclaimed area provides space to install green stormwater infrastructure. Infiltration gardens in curb bump-outs (above and left) can manage significant amounts of stormwater runoff along a roadway.

GROWING SUBURBS

Green stormwater infrastructure can be easily incorporated into the Growing Suburbs because it can be designed into the initial development, avoiding the costs associated with retrofitting a site. While most of the Growing Suburbs currently incorporate stormwater management facilities on site, many older subdivisions could be retrofitted to incorporate additional or more state-of-the-art best management practices.

Implementing green stormwater infrastructure in Growing Suburbs emphasizes improving existing systems and adding smaller, more localized solutions. For example, increasing the number of native plants around an existing retention basin while also adding several smaller rain gardens.

Burnsville, MN City of Burnsville

Creating curb-cuts along the street allows stormwater runoff to enter into depressed rain gardens (left) that can significantly reduce runoff from a street. Using pervious surfaces and paving blocks (below) in areas, such as overflow parking lots, can limit the amount and size of stormwater facilities required.

Campdevanol-Girona, Spain ESCOFET


Bethel Township, PA


Prairie Crossing, IL Liberty Prairie Foundation


Seattle, WA sitephocus.com

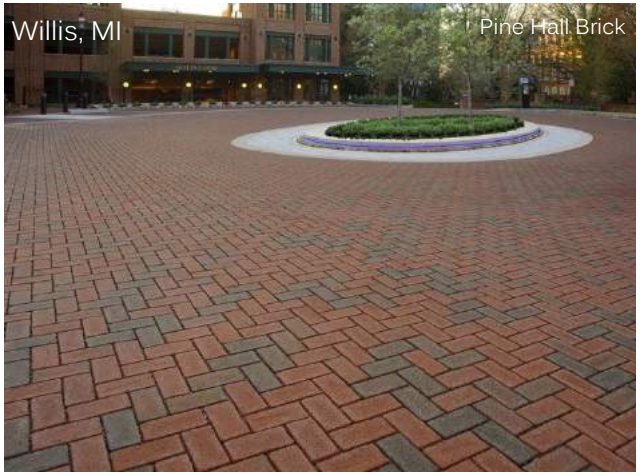
Naturalized stormwater basins are attractive and very effective at handling stormwater runoff. The use of native vegetation within stormwater facilities (above) creates a self-sustaining eco-system that can better manage more stormwater than lawn areas.

CENTRAL PLACES

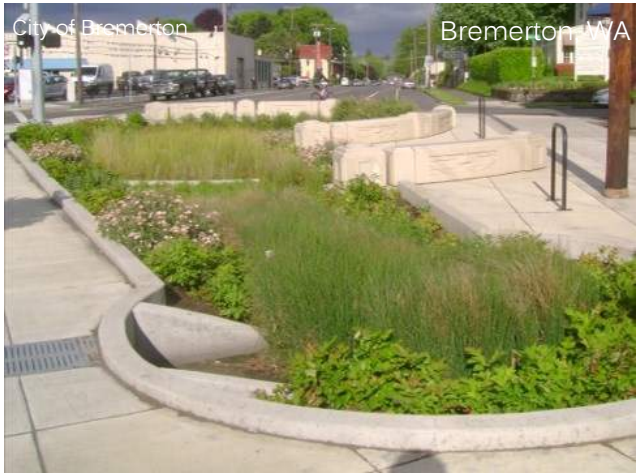
Central Places, or the “downtown” and “main street” areas of the County, can benefit significantly from increased green stormwater infrastructure, which can combine functionality with aesthetics. When a street right-of-way is wide enough, green features such as street trees, pervious pavers, and planters can be incorporated into the built environment. Such elements can both reduce the amount of stormwater runoff and contribute to the revitalization of Central Places, as they often improve the aesthetics and safety of the streetscape.

It is important to consider all of the benefits green stormwater infrastructure can provide in Central Places. Municipalities that identify and proactively prioritize opportunities for installation of green stormwater infrastructure will reap the greatest benefit.


Concord Township


Willis, MI

Pine Hall Brick


City of Bremerton

Bremerton, WA

Integrating green spaces (left, above) into Central Places is an integral part of making an area comfortable for people; they also present a great opportunity to integrate stormwater management and infiltration into downtowns. Many Central Places use different paving patterns to distinguish downtown areas; permeable pavers (above, top) can reduce stormwater runoff and provide a unique look to Central Places.

Green stormwater infrastructure can take many forms in the Central Places. Planted medians (right) and curb bump-outs not only help to increase pedestrian safety, but can also manage stormwater runoff. Planted strips between the sidewalk and roadway (below) can be designed to hold and infiltrate runoff from the roadway as well.

GREEN INFRASTRUCTURE

ACTIVITY CORRIDOR

Activity Corridors, which flank major transportation corridors with intense development, generally have wide right-of-ways and significant areas of pavement. Rainwater runs off of these paved surfaces and into local waterways. As a result, Mature Neighborhoods and many Activity Corridors experience flash flooding issues during heavy storms.

Green stormwater infrastructure can help to reduce the amount of runoff while also beautifying the corridor and increasing the comfort and safety of pedestrians. Examples of green stormwater infrastructure along Activity Corridors may include planted medians or native plants and grasses along the roadside in a depressed swale (below and bottom right).

Nashville, TN

Hawkins Partners

Arlington, VA

Arlington County Government

North Carolina

Our State Magazine


Montgomery County, MD

Dept. of Environmental Protection, Montgomery County


Atlanta, GA

McKenny's Inc.


Alice Webb

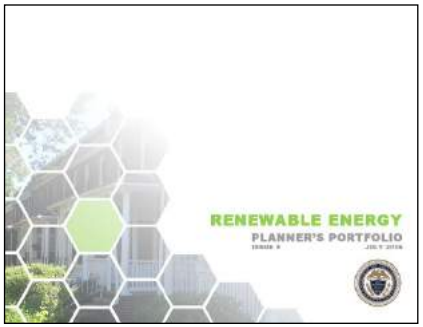
Portland, OR

Improving the design of streets and parking lots along Activity Corridors can turn a functional feature into an asset. Aesthetics are improved by adding swales, rain gardens, tree islands, and hardy landscaping to streets and parking lots (above and left). If curbs are depressed, pressure on the municipality's stormwater conveyance system can be reduced by directing water off of the street and into planted areas designed to handle the stormwater (top left).

OTHER PLANNER'S PORTFOLIOS:

COMPLETE STREETS
April 2016

FUNDING SOURCES
April 2016



RENEWABLE ENERGY
July 2016

Court House and Government Center
201 West Front Street
Media, Pennsylvania 19063

For more information, contact the Delaware County Planning Department at 610-891-5200 or visit www.co.delaware.pa.us/planning to see the complete Planner's Portfolio series.