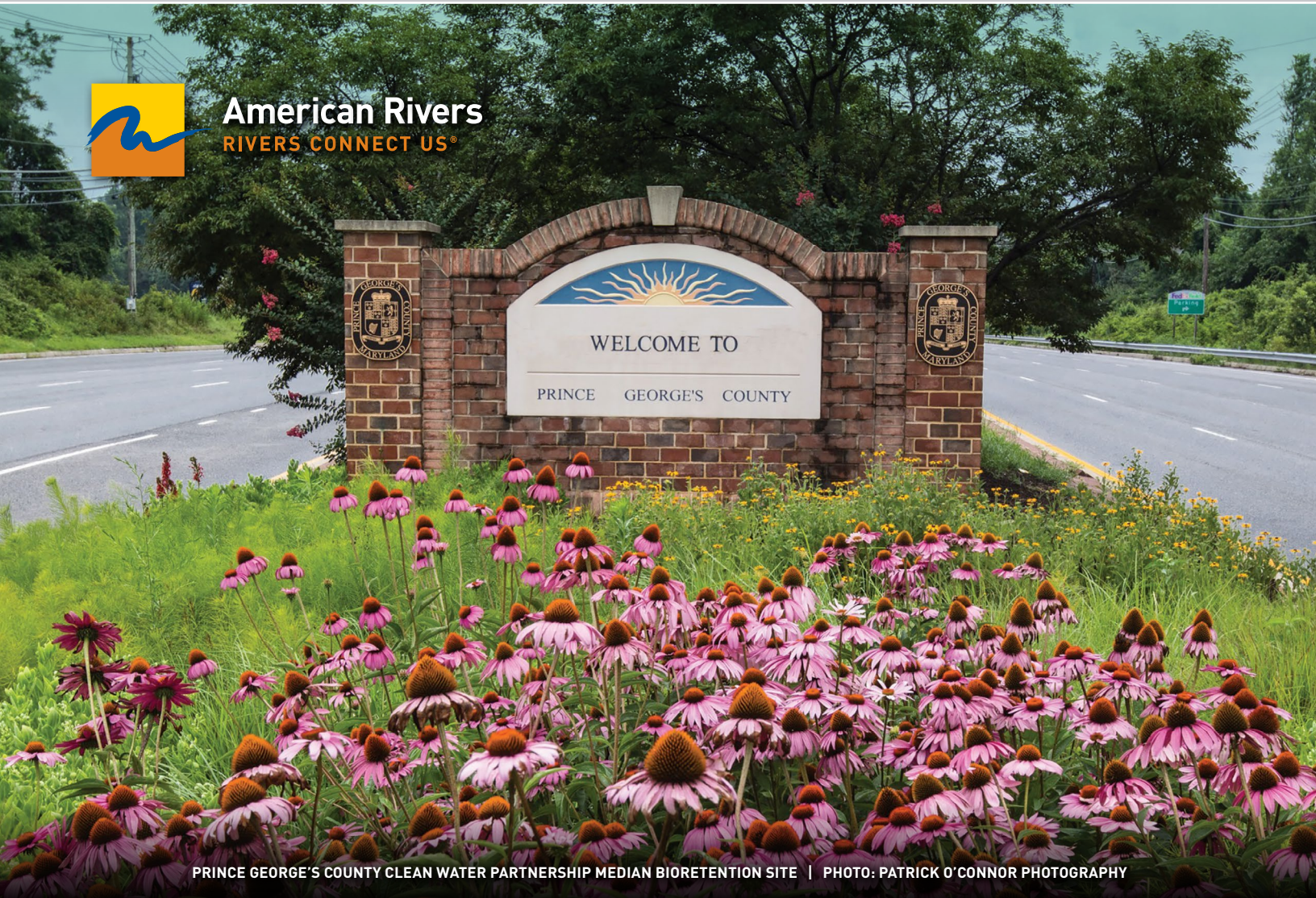




American Rivers
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PRINCE GEORGE'S COUNTY CLEAN WATER PARTNERSHIP MEDIAN BIORETENTION SITE | PHOTO: PATRICK O'CONNOR PHOTOGRAPHY

GATEWAY GARDENS: Stormwater Management for Communities

AMERICAN RIVERS introduces the Gateway Garden as an innovative approach to attracting private investment to benefit communities and help municipalities overcome stormwater management challenges. Gateway Gardens are a type of green stormwater infrastructure (GSI) that is strategically located at the entranceway or “gateway” to a community for maximum visibility. They provide opportunities for local businesses to invest in clean water projects in exchange for the direct benefit of sign advertisement and the indirect benefit of an enhanced community.

Benefits

Partnerships

Gateway Gardens provide partnership opportunities around clean water, community beautification, and business development. Partners can include: community members and local businesses, highway administrations, and municipal leaders with stormwater management responsibility. Partnering together on a Gateway Garden will result in long-term collaboration for clean water and healthy communities.

Community

Gateway Gardens beautify prominent community sites and deliver the social, health and safety benefits of GSI. Gateway Garden projects engage community members, inspiring them to create and support additional GSI in other locations and increasing the

understanding and support of municipal stormwater management programs.

Stormwater

Gateway Gardens offer a solution to pollution by managing stormwater runoff from roadways and nearby developed landscapes and simultaneously reducing some common funding, planning and management barriers to improving water quality.

Sustainability

Gateway Gardens provide a way for businesses in the private sector to help local and state governments cover the full range of GSI project costs from planning through long-term maintenance.



PHOTO: BLAZING STAR GARDENS

Background

Storm events in urban areas carry pollutants from parking lots, rooftops, lawns and roadways to rivers and streams, often bypassing or stressing water treatment facilities. And when that polluted water travels over hard urban landscapes, it travels with great velocity causing localized flooding and stream bank erosion. GSI has become the preferred method to manage urban stormwater runoff. GSI uses materials and processes that are natural (such as trees, plants and soils) or that mimic nature (such as porous pavement and rain barrels) to slow runoff when it rains and absorb or remove pollutants before that runoff reaches streams and rivers.

GSI provides communities with benefits above and beyond clean water. It beautifies sites and creates vibrant community amenities. The use of trees and plants is known to increase community livability and create places where people feel safe. In hospital settings, it can even reduce patient recovery periods. The Gateway Garden is built on the principle that GSI at highly visible community sites, such as the entryway or gateway to a community, can provide even greater benefits by raising public awareness and support for GSI elsewhere in the community. Implementing GSI projects throughout a community can help address localized flooding and reduce pollutant loads in waterways or to municipal water treatment systems.

An added benefit of the Gateway Garden is its capacity to bring municipal and highway administration managers together to address their common stormwater management goals. Roadways are common conduits for polluted runoff and locations for localized flooding. Roadways bisect or enter communities and add to the stormwater runoff municipalities need to manage. GSI sites at community gateways address runoff at the junction of highway administration responsibility and municipal responsibility.

The Gateway Garden concept includes:

- 1) Design principles that meet urban stormwater permit requirements and ensure project functionality from implementation and throughout project lifespan including maintenance.

Green stormwater infrastructure is an approach to water management that protects, restores, or mimics the natural water cycle. GSI is effective, economical, and enhances community safety and quality of life.

- 2) A process that capitalizes on community engagement to ensure the design reflects community values, brings benefits to the community and encourages replication to enhance beauty and stormwater management throughout a community.
- 3) A sustainable financing strategy to ensure the project's success, add to community vitality and help offset the strain on municipal budgets caused by increasing stormwater management needs as communities grow, water infrastructure ages and a changing climate brings more intense storm events to these systems.

The Gateway Garden financing strategy is a key feature of this concept for advancing GSI. The strategy takes advantage of the Gateway Garden's high profile and high traffic siting to encourage business advertisement on the site. The entryway to a community is an ideal advertising location for businesses within the community or with business interests in a community, and businesses have demonstrated a willingness to pay (WTP). Businesses investing in local stormwater management practices that enhance community livability reap a return on their investment and contribute to the public good. The Gateway Garden is a small but viable example of a public-private partnership contributing to clean water and healthy rivers.

This guide presents key Gateway Gardens features for siting, design, economics, and engagement, developed by American Rivers based on projects in Harrisburg and Lancaster, Pennsylvania, and with feedback from communities elsewhere in Pennsylvania, including the Philadelphia area. It is a resource for municipalities interested in including the Gateway Gardens concept in their stormwater management programs.

Selecting Sites for Gateway Gardens

The Gateway Gardens concept includes a process of site evaluation and selection based on the unique priorities of the community. American Rivers developed and tested this process using desktop assessments and partner engagement in Lancaster and Harrisburg, Pennsylvania. From this work, the following recommendations were developed for selecting a portfolio of Gateway Gardens sites.

A primary objective of a Gateway Gardens site or portfolio of sites is to blend environmental, social, and financial sustainability in a way that is valuable to the local community. Once the community's needs are understood, the "best" sites can be prioritized and even ranked based on how their characteristics support the community's defined priorities as well as the sustainability objectives of the program.

Some of these priorities—such as good visibility for advertisers, and ability to infiltrate stormwater—are universal regardless of location. Others, such as proximity to walking trails or gathering spaces, may depend on the setting and may have varying importance to different communities. The figure below groups key siting priorities into four different categories: those that benefit communities, advertisers, plants (which must be able to grow at the site), and stormwater management.

Additional siting priorities may be identified through the process of engaging with and gathering input from local partners.



PHOTO: MELIORA DESIGN, 2018

A desktop assessment can help identify the best locations for Gateway Gardens.



PHOTO: HUNTER ARTON, 2016

Sites should be chosen to maximize visibility.

Gateway Gardens Site Selection Considerations

Community Access

Communities can benefit from the landscape improvements offered by Gateway Gardens. Community members should be engaged early in the planning process to help identify priority locations, for example near walking trails, parks, or schools.

Advertising Visibility

Potential advertisers will likely be most interested in a Gateway Garden that is located within view of a high-traffic road or intersection in their own community.

Good Growing Conditions

Gateway Gardens need plants, and plants need a location that has good drainage, ample sunlight, and is free from environmental contaminants.

Stormwater Management

In order to capture and infiltrate stormwater, the Gateway Garden must be located on well drained soils, adjacent to a high-runoff surface (such as a road), and must have sufficient space to ensure that design requirements can be met.



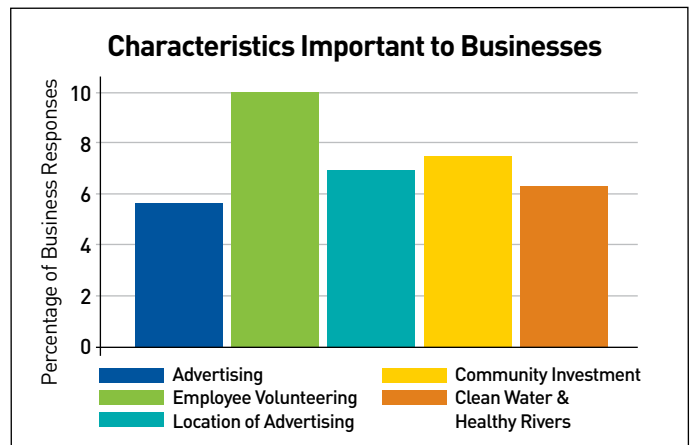
PHOTO: GAVIN DEMING, 2015

Gateway Gardens can improve the appearance of traffic triangles and medians.

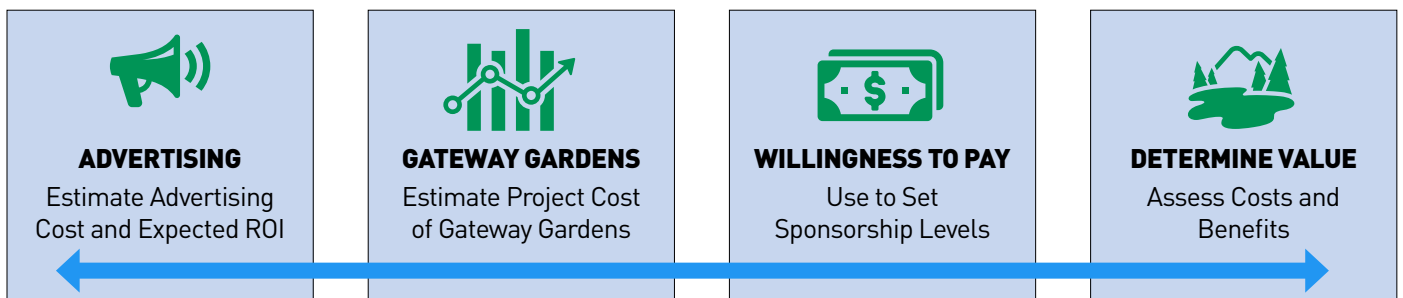
Financing the Gateway Garden

Private investment is a key component to successfully scaling public GSI. This is made possible by the incorporation of promotional space at project sites for participating businesses. Understanding perceptions of the local business community can help guide policies and programs to motivate private sector participation in assisting municipalities in stormwater reduction goals. The following section illustrates the process applied to estimate the value, for the public and private sector, of investing in Gateway Gardens in Lancaster County, PA.

American Rivers asked businesses in Lancaster County, PA to consider if characteristics consistent with Gateway Gardens were important to them.¹ Most respondents perceived that clean water, community investments and volunteering were of greater importance to their business than advertising investments. The visibility and promotional features of Gateway Gardens provide a platform for businesses to communicate support for water quality improvements and community investments to the public.



Illustrated below is a simplified market valuation approach used to estimate the value of products and services not currently in the market, like Gateway Gardens. Cost estimates and survey responses from businesses in Lancaster County were applied to estimate the monetary value and willingness of local businesses to pay for public GSI aimed at increasing water quality in the region.



¹ Survey was distributed to local businesses in Lancaster County, PA in Spring 2019.

American Rivers assessed the potential value of a Gateway Garden in Lancaster County by using this simplified market valuation approach to address the following questions.

How much do businesses pay for advertising?

The amount a business allocates for advertising can be roughly estimated with local information. Some reports suggest a business should typically invest 1% of annual sales for advertising expenditures.

The visibility and promotional opportunities Gateway Gardens offer to businesses can be compared to similar marketing tools currently used in billboard advertising and provide an estimate for WTP.

Advertising in Lancaster County	
Business's average monthly advertising budget	\$2,550
Monthly cost of Billboard Advertising	\$3,000

What are the costs and benefits of Gateway Gardens?

A variety of resources are available to estimate cost and benefits for GSI projects. The estimates in the table below are based on the average cost of bioretention and urban infiltration practices for treating 1.5" of rainfall across the drainage area.

The total project cost of Gateway Gardens includes construction (capital) cost for meeting stormwater retention requirements, O&M for the life of the project and the cost of promotional signage. Benefits include reduction to municipal costs and direct environmental benefits, as well as educational benefits. In addition to those shown in the table below, GSI solutions can produce additional health, social and environmental benefits including improved air quality and pedestrian mobility.

Estimated Costs and Benefits of Gateway Gardens in Lancaster, PA			
Costs		Benefits	
Capital Cost ¹	\$ 26,842	Annual Value of Reducing Combined Sewer Overflows ⁶	\$ 1,745
Maintenance (project life) ²	\$ 22,510	Annual Value of Recharging Groundwater ⁶	\$ 114
Cost of Signage ³	\$ 149	Annual Value of improved Stormwater Quality ⁶	\$ 539
Average Annual Cost ⁴	\$ 2,319	Annual Value of Educational Benefits ^{6,7}	\$ 14
Total⁵ Cost of Gateway Garden	\$ 49,501	Total⁵ Benefits of Gateway Garden	\$ 60,360

Note: All cost and benefit estimates reflect (inflation-adjusted) prices in 2019 US Dollars and based on a sample size project for a Gateway Garden in Lancaster PA for a BMP with an average drainage area of 8,746 sq. Ft and designed to capture for 1.5" per rain event.

¹ Capital cost estimates include design, construction and land cost. Criteria for estimates reflect values associated with raingardens and bioswales and were obtained from the following sources: the Chesapeake Assessment and Scenario Tool (CAST); the US EPA Stormwater Calculator; and estimates by local contractors in Lancaster, PA.

² Maintenance cost is estimated as 5% of capital cost for the life of the project (25 years) plus inflation.

³ Cost of signage was provided by professional signage company (Genesis Graphics Inc.).

⁴ Average Annual Cost includes capital costs as described above amortized over the BMP lifespan (25 years) plus maintenance costs adjusted for inflation.

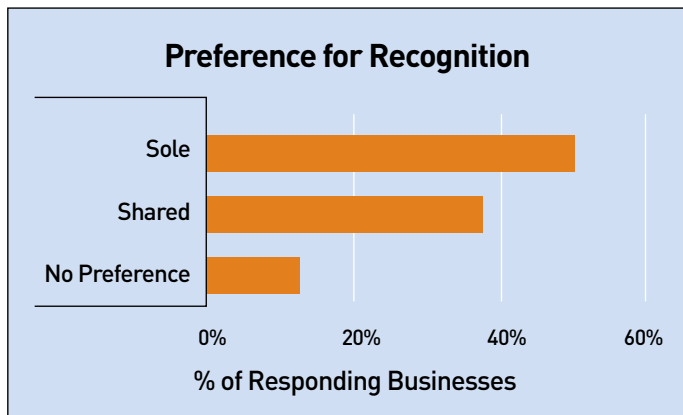
⁵ Assumed project lifetime of 25 years.

⁶ Earth Economics, 2018. *User Guide: Green Infrastructure Benefits Valuation Tool*. Benefit estimates are for raingardens and bioswales and reflect local precipitation averages in Lancaster, PA (42" of annual rain fall (18" snow fall) and 144 rainfall days annually).

⁷ Assume an education cost of \$15.54 per student hour at 30 student hours per year.

How much are businesses willing to pay to sponsor Gateway Gardens?

Gateway Gardens uniquely offer promotional space that encourages participation from the private sector to finance GSI. A marketing framework for Gateway Garden projects includes selecting premier advertising locations. If we assume that these locations will produce results similar to billboard advertising, we can estimate a business's



WTP to advertise in a Gateway Garden. Another way to estimate WTP is by asking (surveying) businesses. While the survey American Rivers conducted was not designed for this purpose, it does provide some valuable insights about WTP.

Responses from the survey revealed that a business's WTP pay for a Gateway Garden project aligns with preferences for the extent of recognition. Most businesses in Lancaster prefer to be the sole business recognized. But many prefer to share recognition with other businesses, and some had no preference between receiving sole recognition and shared recognition. Sole sponsorship is more costly, with one business underwriting the entire project and committing to a long-term community investment. Whereas shared sponsorships allow businesses to share the cost, and partner with others that share their core values.

In either case, businesses are likely to pay more for recognition if the Gateway Garden location is in an area that is highly visible to vehicles and/or pedestrians.

What is the value of Gateway Gardens?

The value of GSI can be difficult to monetize because it encompasses economic, environmental and social benefits. The monetized benefits of nature-based solutions tend to under-estimate the benefits to human health and ecology. Flexibility in the design and scale of Gateway Gardens can increase the range of benefits provided to businesses and communities.

This graph displays the net public and private benefits over the life of a Gateway Garden project. The public net benefits are based on the estimated costs and benefits in the table on the previous page. The private net benefits include the added value of expected increases in annual sales.

Based on the average monthly sales for businesses in Lancaster County and assuming customer response to Gateway Gardens signage is similar to that of a billboard, sponsoring a Gateway Garden could increase sales by \$30,000 a year. As part of the community, businesses also

share a portion of the environmental benefits associated with GSI and potential social gains from investing in local neighborhoods.

This demonstrates how the economic, social and environmental returns of Gateway Gardens to public and private investors can outweigh costs and result in a sustainably funded GSI practice.

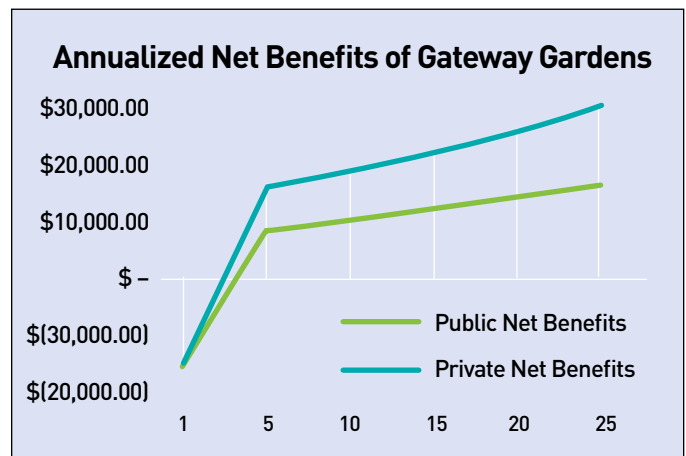




PHOTO: GAVIN DEMING, 2015



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