



SUMMARY

JOB CREATION & ECONOMIC DEVELOPMENT BENEFITS

of Green Stormwater Infrastructure



WHAT YOU NEED TO KNOW

Green stormwater infrastructure (GSI) can support local economic development and job creation by:

- Creating more high-quality, entry-level jobs compared to gray infrastructure investments
- Generating greater economic benefits in terms of local employment and economic activity relative to larger-scale gray infrastructure projects
- Positively influencing economic activity through increased property values, rental rates, retail sales, and employee satisfaction
- Adding vitality and “curb appeal” that attracts business activity, promotes development, and deepens quality of life



This is a summary of a full guide produced as part of the GSI Impact Hub, a larger project that provides resources and support related to specific GSI co-benefits. Please visit the GSI Impact Hub [website](#) to explore these resources including:

- Compendium of GSI Co-benefits Valuation Resources
- GSI Impact Calculator, a block-level tool for quantifying and monetizing co-benefits
- Full-length guides related to flood risk reduction, green jobs and economic development, heat risk reduction, habitat and biodiversity, and transportation.

The GSI Impact Hub is a collaboration between The Nature Conservancy, Green Infrastructure Leadership Exchange, One Water Econ, government agencies and technical partners.

Please see the full guide to “Understanding and Quantifying the Job Creation and Economic Development Benefits of Green Stormwater Infrastructure” for citations to the sources referenced in this summary.

Green stormwater infrastructure (GSI) practices including green roofs, trees, bioretention areas, and permeable pavement, create shade, improve roadway safety, and add visual appeal. These practices also are capable of being designed and constructed by local labor. Because of these characteristics, GSI implementation can create economic development benefits in two ways:

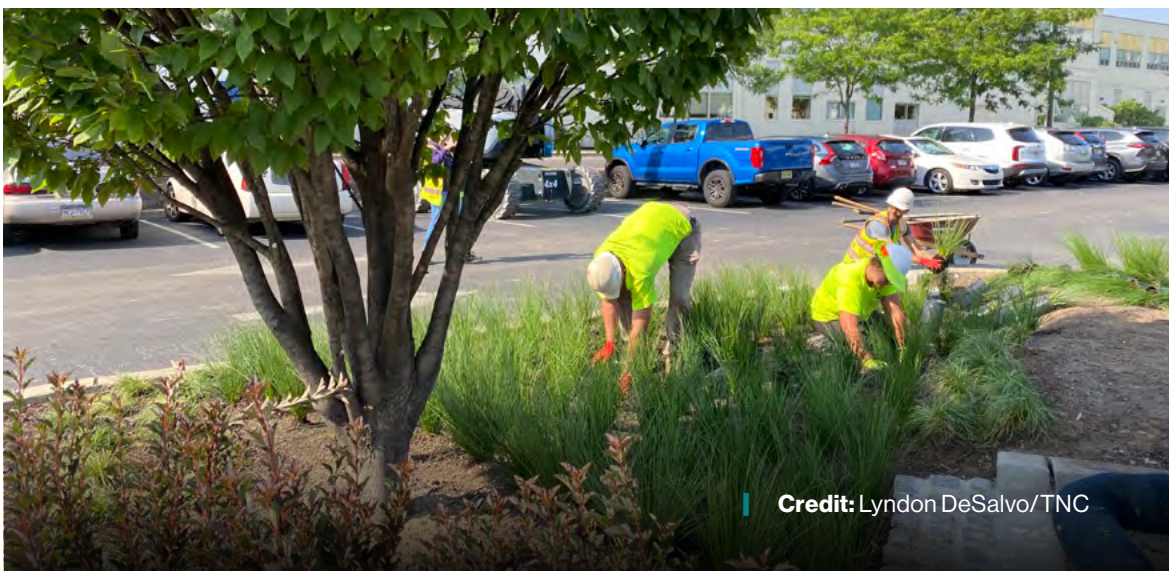
1. Investments in GSI can result in more local employment and spending relative to other stormwater management solutions (e.g., gray infrastructure). GSI investments can also create opportunities for entry-level skilled workers and small local businesses.
2. GSI projects themselves can improve neighborhood aesthetics and quality of life, resulting in economic benefits for businesses, property owners, and residents.



How Does GSI Create Employment and Economic Benefits?

Compared to gray infrastructure, wide-scale implementation of GSI has the potential to create more high-quality, entry-level jobs and generate greater impacts in terms of local employment and economic activity. Larger-scale gray infrastructure projects often require specialized skills. Construction firms performing these activities typically have these skill sets within their existing staff or contractor pool, and often these jobs can come from outside of the local region. In contrast, GSI construction and maintenance require fewer highly trained and skilled employees, resulting in a greater number of entry-level opportunities. When these jobs can be targeted to residents who are unemployed or underemployed (including disadvantaged youth), this creates social benefits and returns money and economic benefits to the local economy.

GSI installations in the public right-of-way or on private property can directly benefit businesses and local economies. Studies looking at the effect of greening urban business districts and strip malls have concluded that consumers are willing to pay a premium on products, visit stores and restaurants more frequently, or travel farther to shop in areas with attractive landscaping, good tree cover, or green streets. Intentionally designed GSI and natural spaces can also fetch higher rents and reduce vacancy rates for commercial office space, retail locations, and multifamily buildings.



Credit: Lyndon DeSalvo/TNC



IDENTIFYING KEY BENEFITS

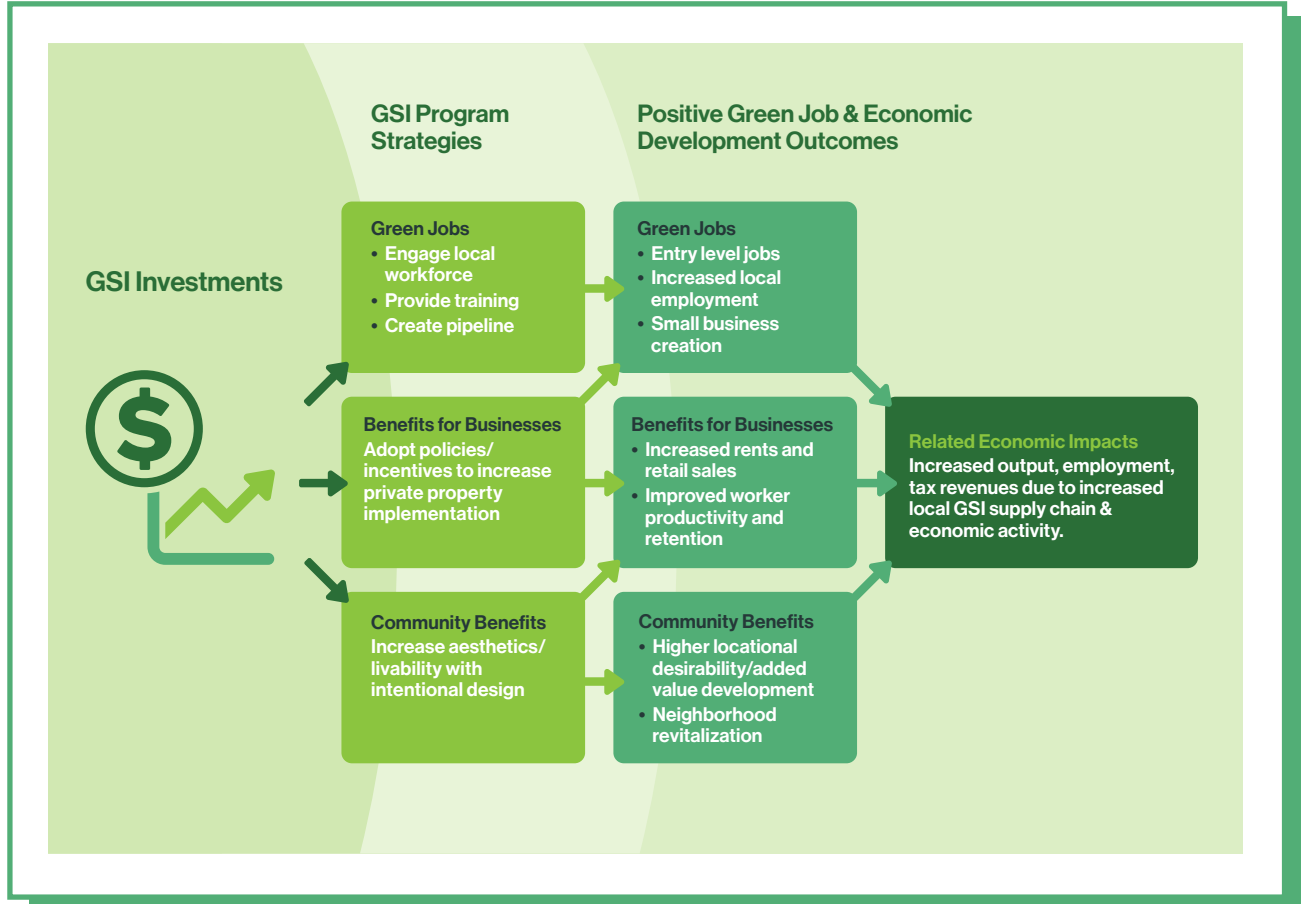
GSI Green Job Creation

Green jobs, as a term, generally refers to employment in businesses that produce goods and provide services that benefit the environment or conserve natural resources. Several studies have confirmed the opportunities for entry-level green jobs created through GSI projects. Fully realizing this potential will require intentional policies and strategies for reducing barriers to career advancement and living wage earnings.



Every \$1 million spent on GSI projects creates between 4 to 6 construction jobs and 3 to 16 maintenance jobs on average.

Figure 1. Using GSI investments to create local employment and economic development benefits.





Credit: Kahil Kettering/TNC

Research	Findings	See Full Guide Section
Jobs for the Future (JFF) GSI workforce trends assessment	Majority of GSI occupation categories require high school diploma or less. 37% of GSI jobs would likely require little to no preparation, while 42% would require a moderate level, typically an associate degree or specialized training.	2.1
Green Stormwater Infrastructure Workforce Collaborative Puget Sound workforce study	While GSI implementation and maintenance jobs often have few educational requirements, these positions are seldom integrated into an established career pathway. Advancing to supervisory or more technical positions often requires workers to obtain a bachelor's or graduate degree. Additionally, most of these entry-level occupations do not provide a middle-wage job.	2.1
DC Water local employment impacts assessment	Per dollar spent by DC Water, hybrid green/grey CSO control alternatives would result in a 25% to 36% greater local employment impact. Overall, economic output was also greater under the hybrid alternatives, in part due to the increased spending on local supplies for GSI implementation.	2.1

Economic benefits to local businesses

GSI installations in the public right-of-way or on private property can directly benefit businesses and local economies. Greening multifamily residential buildings, shopping areas, and commercial corridors can increase neighborhood aesthetics, which in turn increases rental rates, retail sales, and employee satisfaction.

Research	Findings	See Full Guide Section
Assessments of resident, customer, and visitor experiences.	Customers are willing to pay more from business located in areas with trees. GSI installations attract more customers, enhance their experiences, and create reputational value for businesses.	2.2
Economic benefits of New York City “complete streets”	Up to 100% increase in retail sales after implementation of tree planting and GSI installations.	2.2
Urban Land Institute study of 17 real estate projects with GSI.	Developments with green roofs and other GSI improvements report increased market value and higher occupancy rates.	2.2

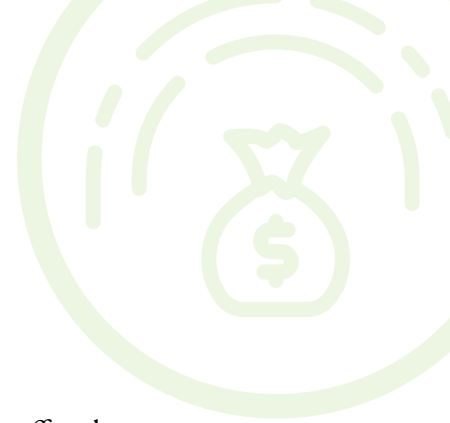
Community economic benefits

GSI projects can provide significant quality of life and neighborhood improvement benefits when specifically designed for this purpose. For example, programs that pair stormwater management opportunities with vacant lot revitalization, community gardens, safe routes to schools, or neighborhood green spaces can result in multiple benefits for residents, including human health benefits, social capital and community cohesion, and improved economic vitality.

Research	Findings	See Full Guide Section
Assessment of Old Fourth Ward Park in Atlanta	Stormwater park as amenity contributes to 56% increase in median property value in surrounding census tract, catalyzing additional development and housing.	2.3
Greater Cincinnati’s Lick Run Greenway project	Stream restoration GSI project has attracted value-added development and increased property values.	2.3
NYC Greenstreets	GSI projects that serve as “pocket parks” create community spaces, including shaded seating areas and play areas.	2.3



QUANTIFYING AND MONETIZING WORKFORCE AND ECONOMIC DEVELOPMENT BENEFITS



Estimating the number and value of jobs and local economic development benefits offered by GSI projects can help make the case for specific projects or partnerships, estimate demand and opportunities for workforce development efforts, leverage additional funding sources, and/or track performance post-project. Several studies and tools have estimated the workforce and economic development outcomes generated by GSI investments.

Tools available to calculate the green jobs created through GSI investments

- The Water Research Foundation's (WRF's) [BMP and LID Whole Life Cost Models](#) can be used to document a range of labor requirements associated with the maintenance of eight different stormwater control measures.
- WaterNow Alliance's [Water Infrastructure Jobs Calculator](#) can help water resource planners estimate the number of jobs created by investments in green roofs, bioswales, rain gardens, permeable pavement, and urban forests.
- Water Research Foundation's [Tool for Quantifying and Monetizing the Triple Bottom Line Benefits and Costs of GSI](#) includes a module on green jobs that calculates both construction and annual maintenance jobs supported by GSI investments, including rain gardens, bioretention facilities, green roofs, street trees, permeable pavement, rainwater harvesting, wetlands, and biofiltration.

Direct economic benefits that can accrue to businesses as a result of GSI-related improvements include increased property values or rents and increased foot traffic and retail sales. The value of aesthetic planter boxes, street trees, green streets, and other GSI improvements for local businesses and residents are often reflected in increased property values or rental rates. Simply put, people are willing to pay more to live or work near areas that provide GSI-related amenities. Typically, researchers rely on a method called “benefits transfer” to estimate these values. A study published by the Natural Resources Defense Council (NRDC) estimates the following benefits from GSI retrofits to office buildings, multi-family residential buildings, and retail centers based on these estimates from the literature:

- Multi-family residential property values increase from 2-5%
- Shade & landscaping increase rental rates for office buildings by 7%
- Rents in multifamily residential buildings with green roofs can be upwards of 16%, but typically within the range of 7 – 10%
- Office building occupancy rates are 8% higher in LEED certified buildings
- Shoppers willing to pay 8-12% higher prices for shopping in areas with tree canopy

Figure 2 presents the results of this assessment, as applied to a hypothetical retail center.

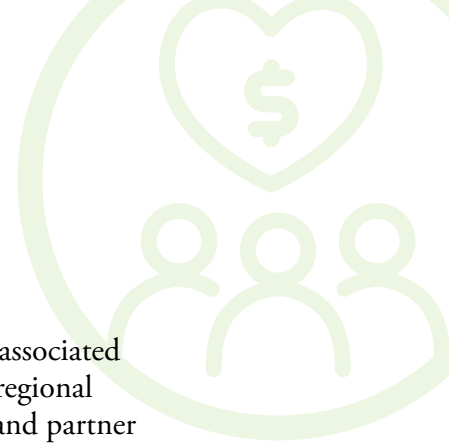
Figure 2. Application of benefits transfer to estimate benefits of GSI installation for hypothetical retail center (2013 USD)



Source: NRDC 2013.



FUNDING GSI FOR WORKFORCE AND ECONOMIC DEVELOPMENT



Effectively realizing the workforce development and positive economic outcomes associated with GSI requires investments by local stormwater agencies and community and regional partners. There are a range of potential funding sources, project delivery models, and partner organizations that target these goals.

Funding Workforce Development

Stormwater agencies are often eligible for funding from workforce development grantmakers such as the [U.S. Department of Labor](#) and [Environmental Protection Agency](#). Other federal funding sources include:

- The Department of Labor’s [Building Pathways to Infrastructure Jobs Grant Program](#)
- Administered by state economic development agencies, the Department of Housing and Urban Development’s Community Development Block Grant program frequently supports job training activities. Municipal stormwater agencies should connect with the [local HUD field office](#) in each state.
- [YouthBuild](#), a U.S. Department of Labor program focused on providing counseling, job preparation, skills training, and apprenticeship pathways to at-risk teenagers and young adults.

Having local partners who specialize in this line of work can be a better approach for public stormwater programs to identify and pursue funding for collaborative approaches to GSI design, installation, and maintenance. Notable examples of these partnerships include:

- Fairfax County Department of Public Works and Environmental Services and the Office to Prevent and End Homelessness [Operation Stream Shield](#);
- Philadelphia Water Department and [PowerCorpsPHL](#), a City of Philadelphia workforce development initiative. PWD regularly hosts PowerCorps participants, who in turn provide routine surface and aesthetic maintenance for GSI projects throughout the city.
- Sanitation District No.1 of Northern Kentucky (SD1) has a partnership with [Groundwork Ohio River Valley](#), a regional nonprofit that focuses on workforce development through soft skills education and on-the-job training in GSI implementation and other restoration and sustainability-based practices.



For more information visit:
gsiimpacthub.org

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