



## Benefits of Green Development

An effective way to address issues of water quality, quantity and amenity, stormwater best management practices (BMPs) provide a host of benefits, including the following:

### Effectively address issues of water quantity and quality

On-site sustainable stormwater practices often increase the infiltration, retention, or detention of stormwater, resulting in an overall reduction in the volume of water leaving a property. This reduction can be significant; [a rain garden project in Burnsville, Minnesota](#), for example, involving the installation of rain gardens on residential lots in a local suburb, resulted in a 90 percent decrease in runoff from the community.

Controlling and reducing the amount of runoff from a site can, in turn, reduce the risk of flooding and the incidence of combined sewer overflow events (CSOs), as well as reduce the size and extent of drainage infrastructure. Retention and detention systems may also decrease overall water consumption as collected rainwater and snowmelt can be reused on-site.

Temporary stormwater detention alters the timing of peak flows offsite, protecting stream channels and other water bodies from the effects of highly erosive flows. BMPs such as wetlands and ponds promote settling and evaporation, reducing pollutant loads, and infiltration BMPs, such as rain gardens, sand filters, and porous pavement, perform the added function of improving water quality through natural biological and chemical processes as water percolates through the sand or soil.

The use of vegetation in sustainable stormwater management practices provides substantial benefits for water quality and quantity. Vegetation intercepts rainfall, reducing the erosivity of raindrops. Vegetation increases surface friction, slowing runoff and promoting settling of suspended solids. Root systems increase pore space and promote infiltration of stormwater, and the roots themselves help to anchor soil, protecting against rill and gully formation from concentrated flows. Finally, vegetation can help to remove pollutants from stormwater through biological uptake of nutrients.

### Increase the likelihood of regulatory compliance

Many communities are driven to consider stormwater best management practices in the face of TMDL, NPDES or local regulations involving increased water quality or monitoring requirements. In the early 1990s, in response to a TMDL for the Tualatin Basin and Phase I NPDES requirements, the [Bureau of Environmental Services in Portland, Oregon](#), developed new stormwater management regulations that emphasize the use of sustainable stormwater practices in an effort to meet water quality goals. They



This landscaped curb extension in Portland, Oregon, treats street runoff, serves as a traffic calming device, and contributes to neighborhood greening.

have since become nationally recognized as one of the leading cities for sustainable stormwater management.

Rain gardens, bioswales, wetlands, and ponds offer highly visible compliance with mandates for on-site water quality treatment. A focus on sustainable stormwater management can also help communities meet other goals and regulations, such as the preservation of open space (by combining surface stormwater treatment with parks or recreational facilities, as did [Bellevue, Washington](#)) or stream protection (by reducing the velocity and quantity of stormwater entering a water body).

### **Save money**

Sustainable stormwater BMPs can also offer cost savings over traditional stormwater management approaches. On-site infiltration or detention of rainwater can have a direct effect on the size and number of drainage pipes needed for handling runoff, resulting in lower construction costs. Community participation in the creation or maintenance of sustainable stormwater installations (as is the case with citizen rain garden projects like the [10,000 Rain Gardens initiative in Kansas City, Missouri](#)) can reduce the capital and maintenance costs incurred by municipalities.

Savings from BMP installations can be significant. [Seattle Public Utility Natural Drainage System](#) projects, for example, which primarily consist of streets and street right-of-way alterations that decrease impervious surface area, slow stormwater flows, and increase infiltration, are estimated to be approximately 25 percent less expensive than traditional stormwater systems due to decreased construction and infrastructure maintenance costs.

### **Expand funding options**

In addition to direct installation and maintenance cost savings, multi-functional development projects that incorporate stormwater management features can take advantage of a greater variety of funding sources that support sustainable stormwater management solutions. The public-private partnership between the [Milwaukee Metropolitan Sewerage District and Alterra Coffee Roasters](#) allowed the city to convert the Milwaukee River Flushing Station into a café and interpretive center. The multi-functional installation provides on-site capture and treatment of stormwater and promotes awareness of conservation and wastewater technology. Alternatively, many municipalities now offer financial incentives for projects that incorporate sustainable practices or promote concepts such as low impact design or better site design.

### **Contribute to the livability of a community**

Sustainable stormwater management practices can be integrated into parks or community open spaces, allowing municipalities to address water quality and quantity goals while providing added benefits to the community. The ability to create such multi-functional landscapes can help address the need to preserve open spaces, encourage the revitalization of abandoned or neglected open spaces, and allow for educational opportunities by providing a fun and playful way for people to interact with and learn about water and how it can be managed.

### **Improve environmental image**

Green spaces are highly valued and can increase property values and enhance tourism opportunities. Some highly visible and publicized installations result in national attention, promoting the city or organization responsible for their development. Businesses can demonstrate their commitment to the environment by incorporating sustainable features into their corporate campuses and other locations or sponsoring sustainable practices throughout the community.

## Provide environmental benefits

Last but not least, the use of sustainable stormwater BMPs can result in direct benefits to the local environment. Reduction in the volume and velocity of stormwater entering local waterbodies can reduce stream erosion. Preservation of open spaces allows for habitat preservation and restoration and installations can be designed to support a broad range of landscape types. The focus on reconnecting the natural hydrologic cycle can preserve the integrity of natural systems, minimizing disturbance and potentially returning areas to pre-development conditions.

## Case studies cited above:

- [Bellevue, WA](#)
- [Burnsville, MN](#)
- [Kansas City, MO](#)
- [Milwaukee, WI](#)
- [Portland, OR](#)
- [Seattle, WA](#)