

# PLANNING BY DESIGN

Montgomery County Planning Commission

## Green Streets

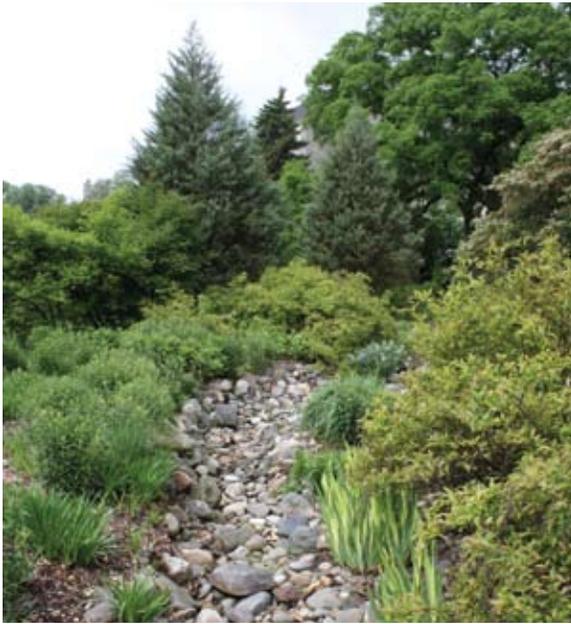
Green Streets are an innovative design concept that can transform our streets into appealing landscaped areas while managing stormwater runoff. Designed to be attractive as well as functional, green streets use vegetation and soil to capture, slow, filter, and infiltrate stormwater runoff. They manage stormwater, provide environmental benefits, beautify our streetscapes, add greenery to urban areas, enhance pedestrian and bicycle safety, and provide habitat. The greatest benefit of green streets is their ability to meet multiple community goals.

While streets effectively move traffic, their impact on the environment is often overlooked. Their impervious coverage generates stormwater runoff, air and water pollution, flooding, and excess heat and can be dangerous for pedestrians and bicyclists. Green streets use innovative stormwater management and landscape design to mitigate these environmental impacts. They improve the water quality of our streams and rivers by filtering and removing sediments and pollutants, decreasing volumes, slowing velocity, and reducing the temperature of stormwater runoff entering our waterways.



*NE 35th and Siskiyou.*

*Photo © Environmental Services, City of Portland.*



*Top photo: MCPC  
This vegetated swale at Scott Arboretum (Swarthmore College) is a visually pleasing stormwater facility.*

*Bottom Photo © Environmental Services, City of Portland.  
This Portland, Oregon curb extension calms traffic and treats stormwater with soil and vegetation.*

## How Green Streets Work

In conventional street design, stormwater runoff is directed into pipes. With green streets, runoff is directed into landscaped areas typically located along the street edge. The water is captured and absorbed into the ground as plants and soil filter pollutants. By using plants and soil to manage stormwater, green streets mimic natural drainage systems and offer an attractive alternative to traditional piped infrastructure. Green streets use various design alternatives to manage stormwater runoff. They may differ in shape and space requirements depending on their purpose, but all provide stormwater benefits. The planting design, vegetation, and soil used are critical to their success, so care is taken in soil preparation and plant selection.

## Design Alternatives

### **Stormwater Curb Extension**

A curb extension or bump out is typically a paved area that extends into the street and is used to help calm traffic and increase pedestrian safety. By altering this design with curb openings that allow runoff to enter and adding a special soil mix and appropriate vegetation, a curb extension can function as an attractive stormwater facility while still providing traffic calming benefits. Curb extensions can greatly enhance many communities, since they can be added to existing streets with minimal disturbance and expense and are flexible in shape and size requirements.



### **Stormwater Planter**

A stormwater planter is similar to a curb extension except it is located between the curb and the sidewalk. This is a preferred option in urban areas where space and parking is limited. These planters, designed with an appropriate soil mix and vegetation, have a curb opening that directs runoff from the street into the planter. Typically, an overflow that connects to the existing stormwater system is provided. Stormwater planters can be designed as either flow-through or infiltration planters. These planters are beneficial for greening urban areas and beautifying downtowns.



### **Vegetated Swale**

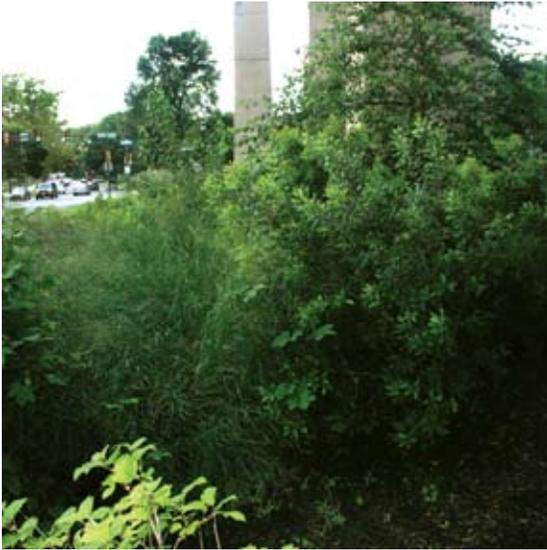
A vegetated swale is another design technique that is most appropriate when used along streets in lower-density residential areas. Vegetated swales are usually narrow, shallow landscaped depressions with a slight slope. They are designed primarily to capture and convey stormwater but may allow for some infiltration. Their design varies depending on topography, soils, and adjoining uses. For steeper sloped conditions, check dams or terraces are used to slow runoff. Vegetated swales are usually inexpensive and relatively simple to construct. They can be incorporated along streets, within boulevards or medians, and planted with a variety of trees, shrubs, grasses, and perennials.

*Top photo © Environmental Services, City of Portland.  
Stormwater planters on this Portland, Oregon Street treat and infiltrate runoff without sacrificing parking*

*Bottom Photo © SvR Design  
This vegetated swale manages stormwater during a major rain event in Seattle, Washington.*



*Top Photo: Seattle Public Utilities  
This roadside swale, in a Seattle neighborhood, is designed as a series of linked rain gardens.*



*Bottom Photo: MCPC  
Stormwater management features along East Falls neighborhood, Philadelphia.*

### **Rain Garden**

A rain garden is a large, shallow landscaped depression designed to detain and infiltrate stormwater runoff. Rain gardens may vary in size and shape depending on the amount of stormwater collected. They reduce and slow water, allowing it to absorb into the ground. Their versatile design offers flexibility in location and shape. Rain gardens can be planted with a variety of vegetation, making attractive additions along streets and becoming community assets.

### **Green Streets in Your Community**

As communities adopt newer stormwater management ordinances in conjunction with Act 167 stormwater management plans and NPDES Phase 2 requirements, they are requiring developments to meet higher water quality, infiltration, stream bank erosion, and peak stormwater discharge standards. Green Streets can be one way to meet these new standards. As with any new technology, these facilities will evolve over time as planting designs, maintenance regimes, and stormwater quality goals are identified. Several cities, such as Portland, Oregon and Seattle, Washington, have pioneered this concept and have successfully created many green streets. Philadelphia is currently proposing using green streets to address stormwater in some neighborhoods. As new streets are built and existing streets are reconstructed, opportunities to use innovative stormwater management, such as green streets, emerge. For further information, contact the Montgomery County Planning Commission at 610.278.3722.

### **Online Resources**

[www.phillyriver.info.org](http://www.phillyriver.info.org)

[www.portlandonline.com/BES/index.cfm?c=34598](http://www.portlandonline.com/BES/index.cfm?c=34598)

[www.seattle.gov/transportation/rowmanual/manual6\\_2.asp](http://www.seattle.gov/transportation/rowmanual/manual6_2.asp)

**Montgomery County Planning Commission**

Montgomery County Court House  
PO Box 311, Norristown, Pennsylvania 19404

website: [www.montcopa.org/planning](http://www.montcopa.org/planning)

