

# Green Infrastructure Community Profile

## Portland, Oregon



### Summary

The City of Portland's Sustainable Stormwater program has moved from pilot projects to citywide Green Infrastructure standards and neighborhood scale applications. Monitored projects show cost-effective on-site capture of 80-95% of stormwater runoff, significant sewer overflow reductions, and pollutant removal.

### Results

After 10 years, Portland has found that Green Infrastructure techniques can reduce peak flows by at least 80-85%, retaining at least 60% of the storm volume of a CSO design storm. Disconnection of over 49,000 downspouts, paying \$53 per downspout for a total cost of about \$2.5 million, has reduced over 1.2 billion gallons of runoff from reaching sewers, reducing sewer overflows by 10 percent.

Other results of the Sustainable Stormwater initiative in 2006 include:

- Two water quality friendly streets projects where 95% of the storm water volume will be infiltrated onsite.
- Conversion of 340 linear feet of roadside ditches to swales
- Planting 105,996 new trees and shrubs across six regulated sub-watersheds.
- Public outreach involving 22,000 students and 10,000 community participants, distributing over 267,000 publications.

### Ordinance/Legal Framework

Portland's Watershed Management Plan, adopted in 2006, requires City agencies to incorporate effective and innovative stormwater management techniques into routine sewer and road projects, and to encourage developers to build water quality protection into new construction.

A Stormwater Management Manual, in conjunction with city code, establishes green designs through which significant new developments and redevelopments must:

- Remove 70 percent of total suspended solids (TSS) from runoff generated by a design storm up to and including 0.83 inches of rainfall over a 24-hour period
- Use surface retention facilities "to the maximum extent practicable"
- Provide on-site infiltration "to the maximum extent practicable"
- Ensure that on-site flow control is sufficient to maintain peak flows at their pre-development levels for the 2-year, 5-year, and 10-year runoff events

The Clean River Rewards Program offers up to 35% discount for stormwater charges to ratepayers who register on site Green Infrastructure practices.

In April 2007 the Portland City Council approved the Green Streets policy to incorporate Green Infrastructure to manage stormwater in all City funded development, redevelopment, or enhancement projects.



Photo Courtesy of City of Portland

### Green Streets – Citywide Standards in Right of Way Projects

*"A basement flooding relief project currently in design is projected to cost 60% of what would have been the cost of a traditional pipe upsize and replacement project. This is because the solution, a mix of Green Streets and private system disconnects, intercepts and infiltrates the water before it enters the public storm system thereby reducing the need to dig up and upsize the existing piped infrastructure."*

*- "Green Streets Policy", page 3, see More Info*

For more information, contact Steve Wise, Natural Resources Portfolio Manager

## Program Highlights

### Green Streets

The Green Streets program relies on street planters, curb extension swales, rain gardens, and permeable pavements to meet “guiding principles”:

- Manage stormwater runoff both at the source and the surface.
- Use plants and soil to slow, filter, cleanse, and infiltrate runoff.
- Design facilities that aesthetically enhance the community.

Projects that do not incorporate Green Infrastructure could be required to contribute to a “1 % for Green” Streets fund.

The program has produced several key steps towards a programmatic citywide approach:

- Clarifying the authority responsible for maintenance (currently the Bureau of Environmental Services in Portland) and the importance of inter-departmental cooperation in implementing a citywide stormwater policy.
- Overlaying multi-bureau project plans and scheduled Capital Improvement Program projects to identify opportunities for green streets development.
- A Green Streets Profile Notebook that provides technical guidance and cost, maintenance and permitting considerations.



*Photo Courtesy of City of Portland*

## Innovative Wet Weather Program

Portland's Innovative Wet Weather Program explores stormwater management projects that improve water quality and watershed health. Projects help reduce combined sewer overflows, stormwater runoff peaks and volumes, and stormwater pollution. Between 2002 and 2005, the U.S. Environmental Protection Agency (EPA) granted the city \$2.6 million for over 25 innovative public and private projects throughout the city that demonstrate sustainable, low-impact stormwater solutions

## Monitoring Results

Monitoring of the effectiveness of existing and new stormwater management facilities to reduce pollutants in discharges and better manage stormwater has found that green roofs reduce peak flows by 97% and retain up to 61% of the volume of a CSO design storm. The average peak flow reduction resulting from vegetated facilities in the public right-of-way was over 80%, and a similar reduction for vegetated infiltration basins, or rain gardens. Rain gardens were also found to retain over 80% of the volume from a CSO design storm, 94% in the case of the Glencoe Rain Garden.

### For More Info

#### Portland Stormwater Management

<http://www.portlandonline.com/bes/index.cfm?c=31892>

#### Portland Green Street Program

<http://www.portlandonline.com/bes/index.cfm?c=44407&>

#### Innovative Wet Weather Program

<http://www.portlandonline.com/bes/index.cfm?c=35941&>

#### Clean River Rewards

<http://www.portlandonline.com/bes/index.cfm?c=ebjhg>