

A pedal powered tour of some of the innovative ways Portlanders handle stormwater



ENVIRONMENTAL SERVICES  
CITY OF PORTLAND  
working for clean rivers

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# Stormwater Cycling



## Sustainable Stormwater Management

When it rains, water runs over pavement and other hard surfaces, picking up pollutants. Sustainable stormwater management mimics natural conditions by allowing rain to be filtered by vegetation and soak into the ground. This reduces the need for infrastructure to convey and clean stormwater before it enters waterways.

### Pollutants In Stormwater

**Particles** - From vehicle exhaust and other sources, unburned hydrocarbons, soot, dirt, leaves, etc.

**Vehicle Wear and Tear** - Copper from brake pads, zinc, cadmium, rubber from tires, lead weights and metal bits

**Vehicle Spills, Leaks and Illegal Dumping** - Liquids with dissolved metal pollutants, motor oil, antifreeze and other petroleum products, solvents and dry materials that can release pollutants like phosphorus and nitrogen.

**Animal Waste** - Fecal bacteria

### Resources

**Bureau of Environmental Services**, 503-823-7740  
Stormwater Management Manual for guidance on sustainable stormwater design. [www.cleanrivers-pdx.org/tech\\_resources/2002\\_swmm.htm](http://www.cleanrivers-pdx.org/tech_resources/2002_swmm.htm)

**Community Watershed Stewardship Grants**, 503-823-5740  
Grants provide up to \$5000 to citizens and organizations to encourage watershed protection and enhancement at the local level. [www.cleanrivers-pdx.org/get\\_involved/stewardship.htm](http://www.cleanrivers-pdx.org/get_involved/stewardship.htm)

**Office of Sustainable Development**, 503-823-7222  
[www.sustainableportland.org](http://www.sustainableportland.org)

**Downspout Disconnection Program**, 503-823-5858  
[www.portlandonline.com/oni/index.cfm?c=28992](http://www.portlandonline.com/oni/index.cfm?c=28992)

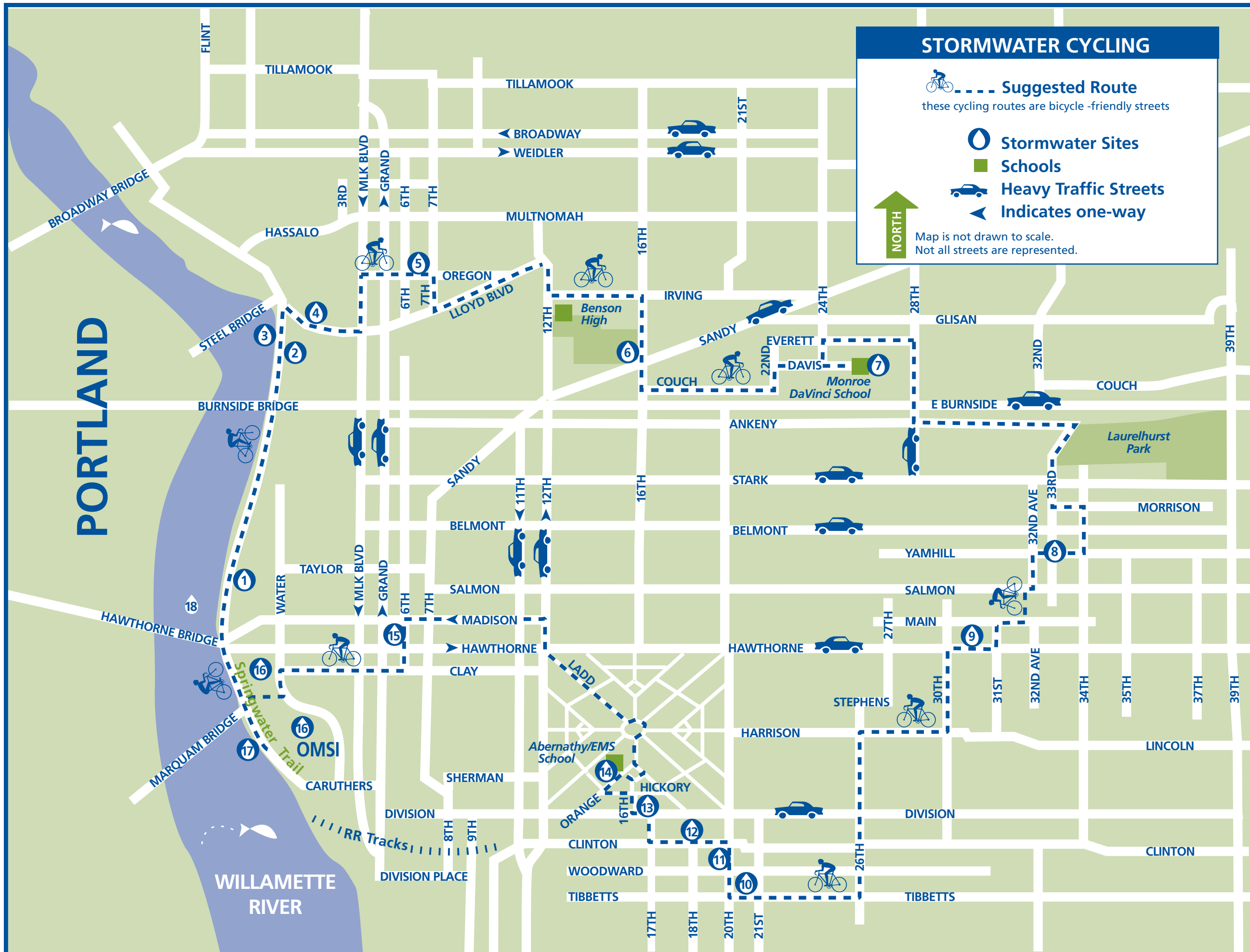
**City Code link to rainwater harvesting**  
[www.bds.ci.portland.or.us/pubs/codeguides/cabo/res34%201.pdf](http://www.bds.ci.portland.or.us/pubs/codeguides/cabo/res34%201.pdf)

**Guide to setting up rainbarrels**  
[www.geocities.com/rainsystem/howto.html](http://www.geocities.com/rainsystem/howto.html)

## Stormwater Tour

Eastbank Esplanade

- Stormwater filter** - ● ▲ Salmon Street Plaza - Plaza runoff collects in a trough sand filter before it's piped to the river at the bottom of the bank to prevent erosion. Native plants on the sloped bank provide wildlife habitat.
- Combined Sewer Overflow (CSO) Outfall Pipes** - ! Along the bank - Sewage and stormwater from Portland's combined sewer system flow into the Willamette River through these pipes during rainstorms. All the projects you'll see on this tour help reduce CSOs. Projects to reduce CSOs to the river by 94% are underway and will be complete by 2011.
- Bioswale** - ● ▲ North end of the floating walkway -The cobble swale off the walkway filters and slows stormwater flowing from the pathway.
- Convention Center** - ● ▲ NE 1st Avenue and Lloyd Boulevard - The rainwater garden around the southwest corner of the building treats and infiltrates runoff from 5.5 acres of roof area before it enters the Willamette River.
- Liberty Centre Parking Garage** - ● ▲ NE Oregon between 6th and 7th - Look for swales that collect and filter runoff originating from the top level of the garage. The swales are next to the sidewalk on 6th and 7th Avenues. (cross street-Oregon)
- Buckman Terrace Apartments** - ■ ● ◆ NE 16th and Sandy - Along NE 16th look for stormwater planters that are both raised concrete planting boxes and garden beds level with the sidewalk. The sidewalk curves to protect mature trees. Look for signs of an ecoroof above the front entryway and a swale along the west side of the building. Also note permeable pavers by the entryway.  
**Buckman Heights Apartments** - ● ◆ 303 NE 16th - Courtyard garden beds infiltrate runoff from the building's downspouts, allowing water to soak into the ground. The parking area at the south property line drains to a rocky infiltration swale.
- DaVinci Water Garden** - ● ◆ 2508 NE Everett - The aboveground cisterns behind the portable classrooms hold water from aerial disconnected gutters. Runoff from the roof and the parking lot is directed to an abandoned tennis court that has been turned into a beautiful water garden.
- Sunnyside Piazza** - ■ SE 33rd and Yamhill - Look for the painted sunflower on the street. This intersection repair features a fountain and cob information kiosk with an ecoroof. Cob is a traditional building technique using hand formed lumps of earth, mixed with sand and straw.
- Hawthorne Hostel** - ■ 3031 SE Hawthorne Boulevard - A front porch ecoroof.
- People's Food Co-op** - ■ ◆ 3029 SE 21st Avenue - Ecoroofs above the solarium (ask to look from the community room for a better view) and the east wall. Downspouts from the rest of the roof drain to an underground cistern and the sidewalk is made of permeable pavers. The new walls and benches are constructed of cob.
- Strawbale Studio** - ■ 2823 SE 20th Avenue - An ecoroof on a strawbale structure built by the homeowner.
- New Day School** - ■ SE 18th Avenue and Clinton Street - The 120 square foot cob solar sanctuary is topped by an ecoroof.
- St. Philip Neri** - ● ▲ SE 16th Avenue and Division Street - Parking lot stormwater drains to the bioswale.
- Environmental Middle School** - ▲ 2421 SE Orange Street - A Naturescaped wildlife habitat at Orange and Birch Streets.
- Multnomah County Building** - ■ 501 SE Hawthorne Blvd, 5th floor - (accessible during business hours) -A 11,893 square foot ecoroof is covered with 6 inches of soil planted with grasses, wildflowers and sedum.
- Oregon Museum of Science and Industry (OMSI)** - ● ▲ 1945 SE Water Avenue - Parking lot swales with curbcuts that allow the water to flow in.
- OMSI interpretive displays** - ! along the bike path behind OMSI - Stop and take a few minutes to read the interpretive signs along the path. These highlight important issues affecting the health of the river.
- Willamette River** - ! All of the techniques on the tour help protect the river.



## You Will See

### Ecoroofs

An ecoroof is a light-weight, low-maintenance vegetated roof system used in place of a conventional roof. The City of Portland encourages ecoroofs to promote sustainable development and integrate stormwater into building and site design.

Ecoroofs are natural sponges in rainstorms and reduce water runoff by up to 90%. They also filter pollutants from rainwater and combat the “heat island effect” that can raise temperatures in developed areas.

### Swales

A landscape swale is a long, gently sloping landscaped depression that collects and cleans stormwater. Swales can filter and clean water before it drains into sewers, groundwater, rivers and streams. When looking for swales, try and find where the downspouts or curb cuts put water into the swale, and the drain where the overflow leaves.

### Naturescaping

Naturescaping is landscaping with native plants. Because Naturescaped areas require less water and fewer (or no) chemical fertilizers and pesticides, Naturescaping helps keep polluted stormwater from entering our waterways.

### Other Technologies

Porous paving, rain water harvesting, and disconnected downspouts are examples of other sustainable stormwater management technologies.