

## What's Happening to the Water Cycle?

As we develop our land and increase the amount of paved surfaces and buildings, known as impervious cover, the water cycle is changed. Less rainfall and snowmelt sinks into the ground and more water flows rapidly over the land into our lakes, rivers and estuaries. Stormwater runoff can lead to increased flooding, erosion, pollution and decreased groundwater recharge during dry periods.

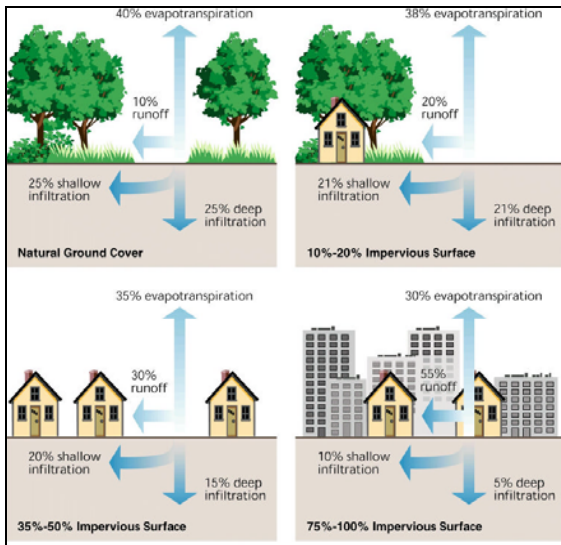


Photo: FISRWG

As impervious surfaces increase, the problems associated with stormwater also increase. Stormwater can contain pollutants such as sediment, nutrients, bacteria and chemicals that can threaten aquatic health, and contribute to the loss of water dependent recreational activities. Stormwater is recognized nationally as the leading cause of water pollution today.

Conventional methods of land development collect and convey stormwater quickly into a series of drains and pipes that flow directly into the closest waterbody with little or no water quality treatment.

## How can we fix it? LID!

Low Impact Development (LID) techniques manage stormwater runoff by imitating the natural movement of water in the environment. LID decreases the volume of runoff and improves water quality by infiltrating, filtering, storing and evaporating stormwater. LID transforms stormwater from a nuisance that must be disposed of quickly into an asset that nourishes ground water resources. Ground water is an important source of drinking water supply, and also helps to maintain stream flow during critical dry weather periods when fish and aquatic life are most vulnerable.

### The primary goals of LID are to:

- Manage and treat stormwater starting at its source and at multiple locations throughout the landscape
- Protect natural systems and processes (water movement, vegetation, native soils, sensitive/important features)
- Incorporate natural features (wetlands, stream corridors, mature forests) as design features into development plans
- Re-evaluate the cost and use of traditional building techniques and infrastructure (lots, streets, curbs, sidewalks, storm drains)
- Preserve open space and minimize land disturbance

LID techniques can be utilized both within your community and around your home. Practices can be applied singly or in a sequence. When multiple techniques are grouped together, water quality and quantity benefits are maximized.

## Low Impact Development Practices

**Rain Barrels** – Low cost collection devices connected to your downspout that store roof runoff for later use. Using rain water for watering plants or washing your car can lower your water bill and decrease demand during times of drought.



**Rain Gardens** – Also called bio-retention areas, are depressed perennial or shrub gardens with both water and drought-tolerant plants. Rain gardens manage runoff by collecting rain water from rooftops and lawns into the garden, where it can infiltrate into the ground. Rain gardens are designed to hold water for only a few hours after a storm, so there is limited opportunity for mosquitoes to breed.



**Swales** – Broad, shallow channels planted with dense vegetation along roads, driveways and parking lots. Properly designed and maintained swales can trap pollutants, increase groundwater recharge and slow the flow of runoff, reducing erosion.



**Buffers** – Natural or landscaped areas used to separate a body of water from an area of intensive land use, preventing sediment and other pollutants from reaching the water.



Photo: US FHWA

**Permeable Pavements** – Surfacing materials such as gravels, concrete pavers, and porous asphalt/concrete which allow rainwater and runoff to infiltrate into the ground, instead of running into the storm drain.



**GreenRoofs** – Engineered systems of soil and plants that detain, absorb and filter rain, and reduce the volume of roof runoff. Green roofs may be applied to many existing flat roofs and new construction. Some green roof companies will work with a homeowner to supply a “do-it-yourself” kit that is appropriate for a residence.



Photo: UCONN NEMO

**Narrowed Roads** – Reduce runoff by decreasing the amount of paved area. This will increase infiltration into the ground and decrease the volume of water sent into the storm sewer system. These roads also calm traffic and can add to neighborhood aesthetics.



Photo: City of Seattle, WA

## Low Impact Development and You

Every resident can promote the use of LID in their community. Ways that you can be proactive include:

- Incorporate one or more LID practices in your own yard
- Educate others in your neighborhood about the benefits of LID
- Encourage your municipal officials to implement LID demonstration projects in public areas
- Promote discussion of community-wide LID goals
- Participate with your local government to amend existing zoning and/or subdivision regulations to allow the use of LID

*All LID features require some maintenance to work properly over their lifespan, but are often less work than traditional landscaping practices.*

## Low Impact Development Working for You

A number of Connecticut communities are starting to use LID practices. Shown below is a drainage swale created along a busy road in Wallingford designed to capture and filter runoff before it enters a local lake.



Photos: USDA NRCS

## The Benefits of Low Impact Development

### For Your Town:

- Can preserve features that are important to a town's character
- Helps balance the need for growth with environmental protection
- Reduces the costs of infrastructure maintenance (streets, curbs, sidewalks, storm drains)
- Slows/calms traffic and provides an attractive and pleasing environment for residents through narrower streets and street side plantings
- Can be applied to residential, commercial and even industrial properties
- Is consistent with environmental responsibility while increasing marketability.



### For Your Environment:

- Helps maintain the natural hydrology of the site and the health of our surface and ground water supplies
- Preserves the ecological and biological balance of the natural system
- Protects water quality by reducing sediments, nutrients, and other pollutants
- Preserves trees and other natural vegetation
- Provides habitat for wildlife

## Want to Know More? Click to Explore!

UConn's Nonpoint Education for Municipal Officials (NEMO) website provides tools, resources, publications and more:

[www.nemo.uconn.edu](http://www.nemo.uconn.edu)

For NEMO's LID elements, site design and more:

<http://nemo.uconn.edu/tools/stormwater/index.htm>

For NEMO's guide to building a rain garden:

<http://www.nemo.uconn.edu/tools/publications.htm>

The USDA Natural Resource Conservation Service has information about rain gardens at:

[http://www.ct.nrcs.usda.gov/elc-educational\\_materials.html](http://www.ct.nrcs.usda.gov/elc-educational_materials.html)

Jordan Cove Urban Watershed Project discusses the creation of a LID neighborhood in CT:

<http://jordancove.uconn.edu/>

The CT DEP Stormwater Quality Manual provides guidance on including LID in development:

[www.ct.gov/dep/stormwater](http://www.ct.gov/dep/stormwater)

Boston Metropolitan Area Planning Council, LID Toolkit provides information and resources:

<http://www.mapc.org/LID.html>

U.S. EPA LID website offers information:

<http://www.epa.gov/owow/nps/lid/>

**\*First Brochure of the LID Series\***

For more information contact Connecticut DEEP's Watershed Management Program

(860) 424-3020

<http://www.ct.gov/dep/watershed>

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# Rainfall as a Resource

## A Resident's Guide to Low Impact Development In Connecticut



This neighborhood in Waterford, CT was constructed using multiple Low Impact Development techniques. Photo: Jordan Cove Urban Watershed Project, UCONN.



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