

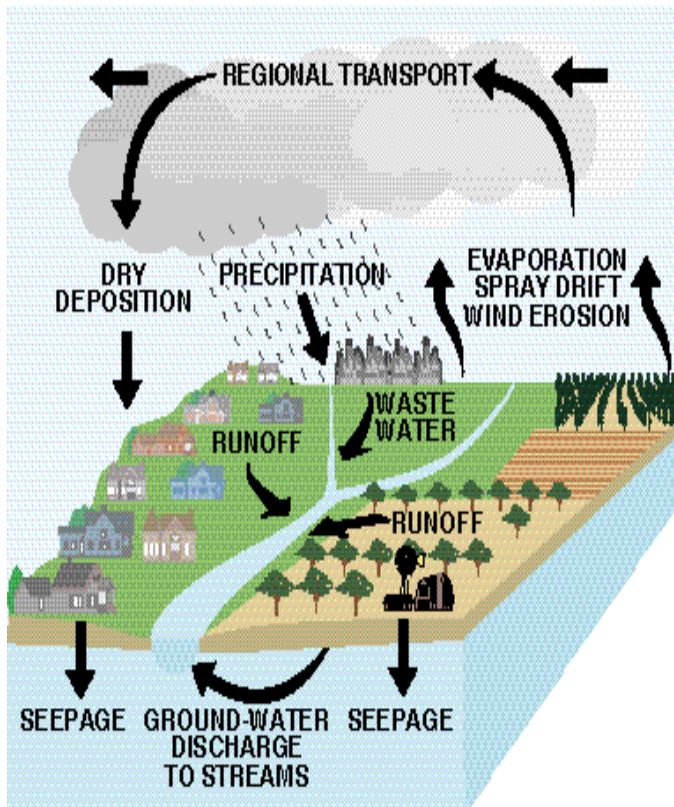


KEY WORDS: Low Impact Development (LID), Best Management Practices (BMPs), Nonpoint Source (NPS) Pollution, Watersheds

WHAT'S THE PROBLEM WITH STORMWATER?

Stormwater runoff is rain (or snowmelt) that flows off developed land such as roads, parking areas, rooftops and lawns, into nearby streams and rivers. Runoff enters these water bodies untreated either directly or through drainage systems. Stormwater runoff poses a high risk to the health of our states waterways by causing several major problems.

1. Stormwater **transports a mixture of pollutants** such as petroleum products, heavy metals, animal waste and sediments from construction sites, roads, highways, parking lots, lawns and other developed lands, which has impacted virtually all urban water bodies in West Virginia.
2. During the spring and winter months, **high stormwater peak flows** can cause flooding, property damage and lead to loss of habitat for fish and wildlife by eroding stream banks, widening stream channels, depositing excessive sediment and altering natural streams and wetlands.



In addition, more impervious surface area means less water soaks into the ground. As a result, **drinking water supplies are not replenished and streams and wetlands are not gradually recharged**. This can lead to water shortages for people and inadequate stream flows and water levels for aquatic organisms and other wildlife.

WHAT IS LID?

The goal of low impact development (LID) is to develop land and manage stormwater in a manner that **imitates the natural hydrology (or movement of water)**. In a mature forest setting, nearly all the rainfall (or snowmelt) is intercepted by the canopy or disperses along the forest floor, where it infiltrates into the ground. It is soaked up by the roots of plants and trees, evaporates or replenishes the groundwater. Researchers estimate that only about one percent becomes surface runoff.

When forests and natural open spaces are cleared, and buildings, roads, parking areas and lawns dominate the landscape, rainfall becomes stormwater runoff, carrying pollutants to nearby waters. Much less water infiltrates than is soaked up by plants, less evaporates back to the atmosphere, and much more (20-30 percent in a suburban neighborhood) becomes surface runoff or stormwater runoff.



LID is typically carried out by implementing several BMPs resulting in a reduction or elimination of traditional stormwater infrastructure.

THE BENEFITS OF LID

1. **LID can help communities more efficiently and effectively** manage stormwater, and protect their water resources.
2. **LID can help protect the environment.** LID techniques remove pollutants from stormwater, reduce the overall volume of stormwater, manage high storm flows, and replenish streams and wetlands.
3. **LID may reduce flooding and protect property.** Reducing impervious surfaces, increasing vegetation and dispersing and infiltrating stormwater results in less runoff. This reduces the likelihood of flooding from large rain events.
4. **LID helps protect human health** by more effectively removing pollutants from stormwater. Untreated stormwater can be unsafe for drinking and swimming.
5. **LID protects drinking water supplies** by ensuring that rainfall infiltrates and recharge aquifers, rather than being treated as a wastewater.
6. **LID is good for the economy.** LID can help protect our natural resources, water quality and reduce sediment loads. This ensures that our resources remain clean and the surrounding Chesapeake Bay and Ohio River watersheds remain a great place to operate a business and attract employees. If our rivers and streams are clean, taxpayers don't have to bear the burden of expensive cleanup efforts for polluted waters.
7. **LID provides cost-effective alternatives to systems upgrades.** Land developed prior to the 1990s usually provided little, if any, stormwater treatment. In many cases, LID solutions are much less expensive than costly stormwater vaults or land-consuming stormwater ponds. Applying better site design BMPs to new developments reduces impervious surfaces, protects sensitive and valuable resources, and reduced stormwater runoff in the first place. Implementing LID before, during and after construction minimizes stormwater management costs and protects our environment.
8. **LID can increase the appearance and aesthetics of communities.** LID projects leave more trees and plants and have less impervious surfaces, which makes for greener developments and communities.
9. **LID can increase public safety.** One of the hallmarks of LID is slightly narrower streets. Studies show that when vehicle traffic is slowed, there are fewer pedestrian accidents and fatalities.

EXAMPLES OF LID



STREET CURB BUMP-OUT



PARKING LOT RETROFITS



GREEN ROOFS AND [MORE](#)

Go to: <http://www.dep.wv.gov/WWE/Programs/nonpntsource/Pages/LID.aspx> to learn more



WHAT ARE BMPs?

BMPs (best management practices) are techniques used to control stormwater runoff, sediment control, and soil stabilization, as well as management decisions to prevent or reduce nonpoint source pollution. The EPA defines a BMP as a “technique, measure or structural control that is used for a given set of conditions to manage the quantity and improve the quality of stormwater runoff in the most cost-effective manner.”

ADDITIONAL STUDY RESOURCES

1. Center for Watershed Protection – Stormwater Management
<http://www.cwp.org/2013-04-05-16-15-03/stormwater-management>
2. Reducing Stormwater Costs
http://www.envirothon.org/pdf/2012/03_EPA_reducing_stormwater_costs.pdf
3. How does green infrastructure benefit the environment?
http://www.envirothon.org/pdf/2012/04_EPA_green_infrastructure.pdf
4. LID questions and answers
http://www.envirothon.org/pdf/2012/06_LID_q_and_a.pdf
5. Webinar – LID Strategies, Tools, and Techniques for Sustainable Watersheds
http://www.clu-in.org/conf/tio/owlid_101905/