

Low Impact Development in Western North Carolina

- a policy fact sheet

Allowing Growth and Natural Resources, too

Western North Carolina's beautiful natural resources contribute to area residents' high quality of life, and attract newcomers and visitors alike. New development that is not sensitive to natural resources has the potential to degrade those resources that are critical to the local economy and community well being.

Rainwater flowing off impervious surfaces such as roofs, streets, sidewalks, and driveways is not absorbed by vegetation or the ground as in a natural system. Runoff carries pollutants such as automobile fluids from streets, fertilizers and pesticides from yards, and eroded soil from construction sites into streams.

The volume and speed of runoff erodes streams, leading to muddy waters which can harm aquatic wildlife. Heat from pavement and rooftops is transferred to stormwater runoff, increasing stream temperature. Warmer water temperatures harm many species, including trout, which cannot survive in temperatures over 70 degrees. Runoff and erosion can also impact the scenic beauty of streams.

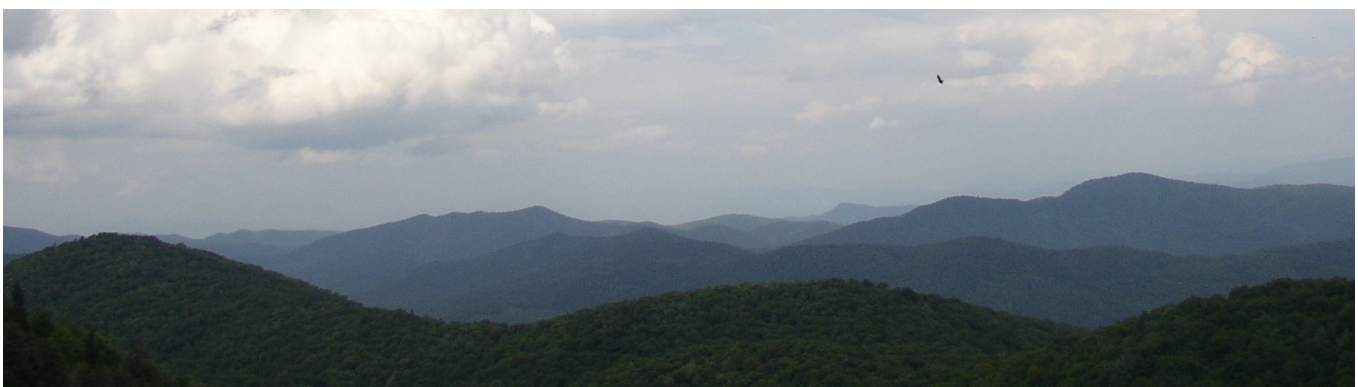
While many existing local policies help address storm water runoff, many citizens in other

communities throughout NC are considering *low impact development* (LID) as a way to balance growth and healthy natural resources.

Local government planning helps provide the broader vision and insight necessary for protecting and restoring natural resources. Regional planning for open space and watershed protection and restoration provide a practical view of the landscape, since our natural resources (water, air, wildlife) cross jurisdictional boundaries.

A planning process should identify a community's important natural resources, and comprehensively address the measures needed to protect and/or restore those resources. Low impact development is a technique that guides natural resource protection and restoration.

LID can minimize impacts to water quality on sites that have been deemed appropriate for development by a community. This fact sheet provides basic policy guidance on LID, and examples of strategies local governments are using to employ this technique in their communities.



A brief definition of LID

The purpose of LID is to mimic the natural water cycle of the landscape, reducing the negative impacts of storm water runoff pollution on streams and rivers. LID includes the following five basic strategies, with multiple techniques for each strategy:

Conserve resources. At the watershed, subdivision, project, and individual lot level, retain natural resources (trees, water, wetlands), drainage patterns, topography and soils whenever possible.

Minimize impact. At all levels, attempt to minimize the impact of construction and development on natural hydrologic cycles and ecological systems by conserving native vegetation, reducing grading and clearing, and decreasing impervious surfaces.

Optimize water infiltration. To the maximum extent practicable, slow runoff and encourage more infiltration and contact time with the landscape by retaining natural drainage patterns, reducing channelization, using vegetative swales, lengthening flow paths and flattening slopes.

Create areas for local storage and treatment. Rather than centralizing stormwater storage, distribute storage across the landscape, adjacent to areas of flow. Use small-scale best management practices (BMPs) such as raingardens and swales which allow for collection, retention, storage, infiltration, and filtering on-site.

Build capacity for maintenance. Develop reliable, long term maintenance programs with clear and enforceable guidelines. Educate homeowners, management companies, and local government staff on the operation and maintenance all practices, and about protecting water quality.

Bioretention areas at the Transylvania County Library treat stormwater runoff from the parking lot and educate citizens about LID





Citizens, officials, and the Transylvania Natural Resources Council participating in a series of Roundtable Discussions are enthusiastic about promoting low impact development as a tool for reducing the impacts of growth on Transylvania County's natural resources.

How should we implement LID in our community?

Lessons for implementing LID arose from a series of LID Roundtable discussions that engaged Transylvania County citizens to consider LID in their community. In particular, the discussions highlighted the need for greater education about LID and its benefits. Continued discussions may include how LID can help meet local goals for natural resource protection, livability, sustainability, and economic development.

Issues to consider include:

How can we engage developers in demonstration projects and highlight existing projects to show LID is compatible with economic and water quality goals?

Should we focus LID efforts in specific areas to protect particular high value natural resources, such as in watershed overlay districts, or support LID throughout the community?

What are differences between rural and urban areas? Urban infill often requires more flexible LID standards due to limited land space.

How can we move the dialogue forward about LID benefits in Western NC? Small steps toward implementing LID, such as removing barriers in local codes and providing educational opportunities, may work well as communities become more comfortable with the concepts. Engaging diverse stakeholders, including developers, emergency officials, and realtors, in discussions is particularly important in discussing policy.

What resources are available to help? The US Environmental Protection Agency has guidance on using LID to manage stormwater, NC State University is developing the NC LID Manual, and several NC agencies offer grants to help with pilot programs and demonstration projects.



Implementing LID through local policy

Strategies to enable, encourage, or require low impact development usually involve a comprehensive review of codes and ordinances. Why is this important?

Many codes and ordinances were developed long before we understood the negative impacts of impervious surface, altered hydrologic regimes, and reduced tree canopy on water resources and wildlife habitat. A number of provisions may obstruct the use of LID, for example: requiring special permits or variances, using curb and gutter, or large lots. The Center for Watershed Protection (CWP) notes that the mix of “subdivision codes, zoning regulations, parking and street standards, and other local ordinances that collectively shape how development happens...create the wide streets, expansive parking lots, and large-lot subdivisions that crowd out natural areas and open space” (1998 Center for Watershed Protection).

To encourage LID, communities are identifying and addressing language in their codes and ordinances that are inconsistent with LID principles and practices and changing this language so LID is a more viable development approach than conventional development. This helps reduce real or perceived risks developers face from potential delays and uncertainty. The CWP Better Site Design Manual is one tool several communities, including those in Haywood County, NC, have employed to identify potential improvements. In addition to ordinances covered in CWP’s benchmarking tool, mountain communities should give special attention to steep slope and ridge development.

Communities are also advised to address LID within their stormwater ordinance, since the goal of LID is to reduce impacts from stormwater runoff to water bodies. Developing or amending a stormwater ordinance is an opportunity to focus community discussions about the connection between natural resource goals and how stormwater is managed. NC provides guidance on LID practices in the NCDWQ Stormwater BMP Manual. UNC-Chapel Hill’s School of Government has recently developed a model stormwater ordinance. (School of Government, 2007)

Western NC communities have many policies that contribute to reducing development impacts on natural resources, including farmland preservation, flood damage control, mountain ridge and steep slope, stormwater and erosion control ordinances. By providing guidance and incentives for low impact development within these, and removing barriers to LID design and practices within other development codes, local governments invite LID into their communities.

Examples of how communities are encouraging LID

NC communities are employing a broad range of strategies for implementing LID. A sampling of strategies include:

Creating demonstration projects: Local examples are powerful LID education tools. Haywood County partners obtained a grant to design and construct the site at Bethel Elementary School using LID techniques. The parking lot rain gardens at the Transylvania County Library and stormwater wetland at Brevard College provide additional examples of LID technique.

Fostering community dialogue and education about LID: A series of Roundtable discussions focused on LID in Transylvania County. Additionally, Haywood County stakeholders participated in a community dialogue to recommend policies for enabling LID. www.ncsu.edu/WECO/haywood

Providing recognition for LID/sustainable projects: Providing publicity and recognition for developers is another helpful strategy. The Lower Cape Fear Stewardship Development Award Program recognizes exemplary projects in 3 counties. www.stewardshipdev.com

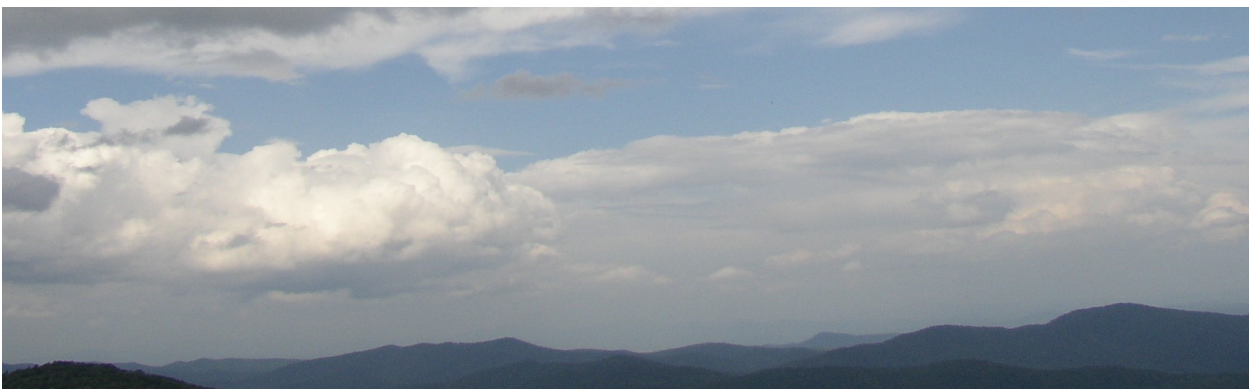
Providing incentives such as increased densities in exchange for conserved natural areas and LID, or shortened review time: Some mountain communities, including the Town of Brevard and Buncombe County, encourage development away from steep areas by providing density bonuses. Henderson County provides density bonuses when criteria such as a minimum percent of protected open space are met.

Removing obstacles in codes & ordinances to make the LID review process more efficient: Some counties working to make ordinances more “LID friendly” include Haywood, Brunswick, and New Hanover. Brunswick and New Hanover Counties and the City of Wilmington passed resolutions supporting LID. In Conover, NC codes, curb and gutter is not a requirement, permitting an alternate street design with flat curbs that allow sheet flow into bioretention areas.

Providing technical guidance for developers: Brunswick, and New Hanover Counties and the City of Wilmington provide a technical guidance manual for developers. The City of Cover provides guidance on how to design flat curbs in lieu of curb and gutter.

Allowing LID to meet stormwater and watershed requirements: Communities may provide LID as an option for controlling stormwater runoff, either jurisdiction-wide or to protect a specific resource. The Town of Black Mountain allows LID development designs to capture and retain runoff. The Town of Cary encourages LID in a conservation overlay district.

Requiring LID to meet stormwater requirements: The Town of Huntersville’s stormwater ordinance requires LID be used to meet stormwater requirements. The City of Hickory requires LID in the Henry River Conservation Overlay district.



Resources for low impact development

Center for Watershed Protection: Better Site Design Manual. www.cwp.org/Store/bsd.htm

French Broad River Watershed Education and Training Center.
www.bae.ncsu.edu/programs/extension/wqg/frenchbroad

Land of Sky Regional Council. Mountainside and Steep Slope Protection Initiative.
www.landofsky.org

Mountain Landscapes Initiative: toolbox for growth & planning.
www.mountainlandscapesnc.org

NC Cooperative Extension County Center. www.ces.ncsu.edu/counties

NC Low Impact Development Manual: Spring 2009 from NC Cooperative Extension.
www.ncsu.edu/weco

NC Division of Water Quality Stormwater BMP Manual. July 2007.
h2o.enr.state.nc.us/su/bmp_forms.htm

NCSU Dept of Biological and Agricultural Engineering: Stormwater Engineering Group.
www.bae.ncsu.edu/stormwater

Soil and Water Conservation Districts: www.ncaswcd.org/districts.htm

Southeast Watershed Forum. www.southeastwaterforum.org

UNC School of Government - Environmental Finance Center: model stormwater ordinance.
www.efc.unc.edu/publications

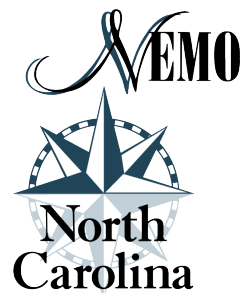
US Environmental Protection Agency Low Impact Development website:
www.epa.gov/owow/nps/lid/

Western NC Green Building Council: sustainable site planning resources. www.wncbgc.org



www.ncsu.edu/weco

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