Low Impact Development (LID) uses easy and cost-saving techniques to manage stormwater runoff close to its source and through natural means. Instead of using extensive underground piping and large holding ponds as in traditional stormwater management practices, LID measures are designed to mimic natural hydrological patterns and vegetation to capture runoff, safely filter pollutants, and recharge groundwater supplies.

LID measures can be customized for a variety of sites and situations and can include:

- **Bioretention Units**
- **Rain Barrels**
- **Vegetated Swales and Buffers**
- **Green Roofs**

Use of these measures can lower building costs because of reduced infrastructure, protect and enhance the natural environment, increase property values, and improve landscaping aesthetics.

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### About Low Impact Development

*Low Impact Development (LID)* uses easy and cost-saving techniques to manage stormwater runoff close to its source and through natural means. Instead of using extensive underground piping and large holding ponds as in traditional stormwater management practices, LID measures are designed to mimic natural hydrological patterns and vegetation to capture runoff, safely filter pollutants, and recharge groundwater supplies.

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### Additional Resources

**Rappahannock Rapidan Regional Commission** -

Additional information about LID being implemented at the Germanna Technology Center

http://www.rrregion.org/lowimpact.html

**Low Impact Development Center, Inc.** -

http://www.lowimpactdevelopment.org

**Prince George’s County, MD, Dept. of Environmental Resources** -

http://www.goprincegeorgescounty.com/Government/AgencyIndex/DER/index.asp

**U.S. Environmental Protection Agency**

http://www.epa.gov/owow/nps/urban.html

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**The site of the Germanna Center for Advanced Technology was redesigned to accommodate LID features. Shown in front of the building is the future location of a bioretention unit in the center of the parking area.**
Bioretention units are specially landscaped areas strategically placed to capture stormwater runoff from paved surfaces and roofs. The units are built in a shallow depression with stratified soils to allow trapped water to be absorbed into the ground, thereby filtering out pollutants as well as recharging groundwater supplies. Excess runoff can also be captured by overflow drainage at the top or through perforated underdrains in the stone layer.

Original construction plans for the Germanna Center for Advanced Technology called for standard stormwater drains throughout the site that would pipe storm runoff to retention basins at the edge of the property. To cut construction costs and preserve the natural landscape, LID principles were incorporated into the plans. Three bioretention units were built across the center of the parking area to collect runoff from the paved surface. Ranging from four to five feet in depth, each unit is filled with layers of stone, pea gravel, organic planting soil, and mulch and finished with plants and grasses.

Using these LID features resulted in a decrease in construction costs for the site due to decreased infrastructure and site preparation. Other benefits include pollution removal, groundwater recharge, the preservation of undisturbed land, and improved site aesthetics.

Advantages of LID

Low Impact Development principles are cost effective, easy to implement, and benefit the environment, developers, and people’s quality of life.

Specific advantages include:

- Potential cost savings from reduced infrastructure and site preparation work
- Improved groundwater recharge and pollution removal through natural ground filtration
- Increase in greenspace aesthetics, natural habitat, and property values
- Potential for higher building densities because of improved stormwater management and a reduction in disturbed land
- Preservation of natural environment and hydrology and reduction of impervious surfaces

Potential Cost Savings

Savings during the construction phase of a project can be derived from several areas, mainly from reduced amounts of pavement, curbs and gutters, and drainage systems. Long-term savings can also result from lower maintenance or remediation of stormwater ponds.

Estimated LID Savings from the Germanna Center Project

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing</td>
<td>$900</td>
</tr>
<tr>
<td>Drainage Structures</td>
<td>$16,200</td>
</tr>
<tr>
<td>Storm Sewer</td>
<td>$33,700</td>
</tr>
<tr>
<td>Pavement—Heavy Duty</td>
<td>$69,400</td>
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<tr>
<td>Pavement—Light Duty</td>
<td>$36,600</td>
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<tr>
<td>Curb &amp; Gutter</td>
<td>$39,000</td>
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<tr>
<td>Reinforced Concrete</td>
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</tr>
<tr>
<td>Walks</td>
<td>$23,800</td>
</tr>
<tr>
<td>Wheel Stops</td>
<td>$9,500</td>
</tr>
<tr>
<td>Bioretention Plantings</td>
<td>$34,200</td>
</tr>
<tr>
<td><strong>Net Savings</strong></td>
<td><strong>$120,300</strong></td>
</tr>
</tbody>
</table>