Why Low Impact Design?

(From Office of Coastal Zone Management and Metropolitan Area Planning Council)

Traditional housing developments often result in sprawl. Entire sites are leveled without regard for the landscape's natural features or hydrology. Paved roads are built much wider than they need to be, and vast parking lots and sidewalks are constructed. Increased impervious surfaces result in more stormwater runoff and reduced infiltration to replenish groundwater and aquifers. Traditional stormwater controls catch runoff and "dispose" of it through a system of catch basins, pipes and ponds. The runoff carries pollutants such as road salt, sediment, oil, heavy metals, pesticides, lawn chemicals and fertilizers and pet wastes which are discharged untreated into lakes and streams. As a result, communities across the Commonwealth are dealing with the unintended consequences of conventional site design: stressed watersheds, polluted waterways, and loss of community character.

Low Impact Development (LID) helps preserve natural systems during the development process. The idea is to create homes and businesses that are integrated into the landscape, not imposed upon it. Natural areas and important features are protected, and stormwater is managed with swales, rain gardens and vegetated areas, rather than costly pipes and detention ponds. As a result, aquifers are recharged, streams and rivers are cleaner, and development

has a more natural appearance. The reliance on natural processes also means that there are fewer pipes and basins to build and maintain, saving money for the developer and the community.

Key Principles of Low Impact Design

Work with the landscape — Identify environmentally sensitive areas and important local features, then outline a development envelope that protects those areas. Maintain slopes and natural drainage; minimize grading and tree clearing.

Focus on prevention — Minimize runoff by using narrow roadways, smaller parking areas, and permeable paving on sidewalks and overflow parking areas. Use green rooftops to store and evaporate rainfall before it leaves the roof.

Micromanage stormwater — Design the site to create many small sub-watersheds and “micromanage” runoff close to where it is created in small decentralized structures. Use a "treatment train" of multiple techniques to maximize infiltration and recharge.

Keep it simple — Before resorting to expensive piped systems, use low-cost approaches and nonstructural practices, such as rain gardens, street sweeping, and public education. Send clean roof runoff to vegetated areas for infiltration.

Photos of some important LID methods green roof above left and rain barrel above right

Photos above left to right and below: Rain garden, narrower road, permeable paving, vegetated swale

Visit the Metropolitan Area Planning Council website for more information on LID techniques...

Pass a Stormwater/LID Bylaw

A local stormwater bylaw is a good way for communities to promote Low Impact Development techniques. In many communities a patchwork of local codes (zoning, subdivision rules and regulations, board of health regulations) may provide overlapping and sometimes conflicting regulation of stormwater discharges. A municipal stormwater bylaw can replace this patchwork with a single set of standards, resulting in environmentally sensitive development and consistency for site design standards in all permitting processes.

Numerous communities have recently developed stormwater bylaws that incorporate LID, and the Massachusetts Watershed Coalition has helped several towns to enact bylaws. The Executive Office of Energy and Environmental Affairs offers a model bylaw in the Massachusetts Smart Growth/Smart Energy Toolkit...

LID Costs

LID techniques are often less costly than standard stormwater controls, thus providing an incentive for developers to use them. A recent study by the US EPA also finds LID practices can be both fiscally and environmentally beneficial to communities. They reported that for projects where low impact designs were employed, infrastructure costs were lower. In most cases, savings were realized due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with only a few exceptions in which LID project costs were higher than costs of conventional stormwater management.

The National Association of Homebuilders strongly advocates the use of LID, both for its potential cost savings and environmental benefits.
For more resources, visit the NAHB Resource Center...