

# Low Impact Development (LID) Technology and Green Infrastructure (GI)

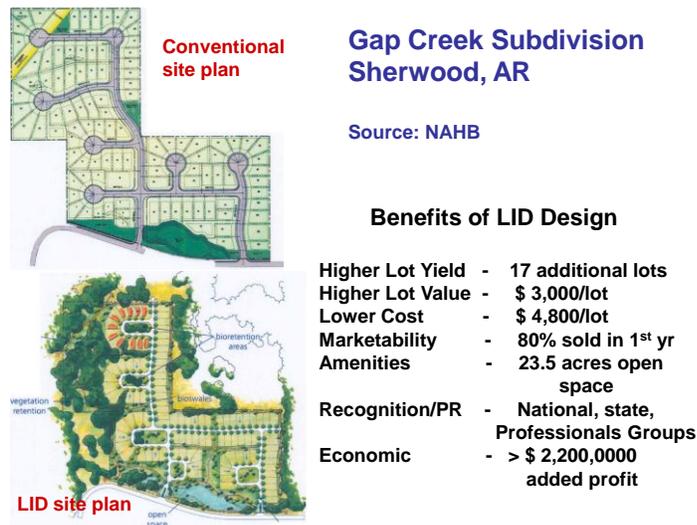
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Low Impact Development (LID) is a rapidly emerging technology which has become a preferred approach to stormwater management in many communities and state and federal agencies. More recently the term green infrastructure (GI) has also become popular and is often used as a synonym for LID. But are these two strategies the same?

**LID** is an approach to land development (or re-development) that was developed in 1998 by Prince George's County, MD with funding support from EPA (Clar, et al. 1998). It works with nature to manage stormwater as close to its source as possible. A key element of LID is to mimic a site's pre-development hydrology as close as possible.

LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product (See Figure 1). There are many practices that have been used to adhere to these principles such as bioretention facilities, rain gardens, bioswales, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions. LID has been characterized as a sustainable stormwater practice by the Water Environment Research Foundation and others.



**Figure 1. Gap Creek LID Subdivision.**

"Green infrastructure" is a relatively new and flexible term, promoted by USEPA, and it has been used differently in different context (<http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm>). EPA intends the term "green infrastructure" to generally refer to systems and practices that use or mimic natural processes to infiltrate, evapotranspire (the return of water to the atmosphere either through evaporation or by plants), or reuse stormwater or runoff on the site where it is generated (Figure 2). Green

infrastructure can be used at a wide range of landscape scales in place of, or in addition to, more traditional stormwater control elements to support the principles of LID.



**Figure 2. Green Roof at the Fencing Academy of Philadelphia (Source: Pennsylvania Department of Environmental Protection)**

It can be observed that GI refers principally to the control practices used to implement LID, and thus with respect to the control measures the two terms overlap. The principal difference between the two concepts is that LID has a very specific target of maintaining pre-development hydrology. This implies that a thorough hydrologic analysis is required to determine whether a project achieves LID status. As a consequence of this requirement, a considerable amount of technical guidance has been developed to guide the application of LID technology.

GI technology does not currently have the same focus. The focus of GI is on the design of the individual GI practices rather than a project or site scale approach. Thus it is possible to implement GI practices without achieving the goal of LID with respect to maintaining pre-development site hydrology. The two concepts can be combined for a comprehensive and successful application.

Clar, M.L., L.S. Coffman, M. S. Cheng, and N. Weinstein (1998) Low-Impact Development (LID) Hydrologic Analysis and Design, paper presented at the 25th Annual Meeting of the Water Resources Planning and Management Division, American Society of Civil Engineers, Chicago, IL, June 9-12, 1998.

Learn more about Low Impact Development (LID) and Green Infrastructure (GI) by attending EWRI's International Low Impact Development Conference in Houston Texas January 19-21, 2015.  
Register for the conference at [www.lidconference.org](http://www.lidconference.org)