CHAPTER 1

Guiding Principles

The guiding principle of the Forging the Link project is to illustrate the advantages of Low Impact Development (LID) in the economic terms of how municipal land use decisions are commonly made. In addition to the environmental and water quality benefits for which LID is so commonly known, considerable economic, infrastructure, and adaptation planning benefits are also being realized through the incorporation of LID-based strategies.

The project was grounded with direct interviews and market surveys with municipal decision makers from the regions of the Western and Eastern Great Lakes and New England. These participants provided valuable insight in the identification of the barriers many have faced in making informed decisions. Those participants confirmed that municipal decision making is faced with the stark economic reality of shrinking budgets coupled with increasing financial demands. The financial demands are driven by the need for permits (TMDLs, MS4 GPs, etc). Regulatory demands are increasing at the same time municipal budget are decreasing.

Considerable economic, infrastructure, and adaptation planning benefits are being realized through the incorporation of LID-based strategies.

Forging the Link aims to demonstrate the substantive economic benefits—for both construction budgets and project life-cycle costs—that are increasingly being observed by municipalities, commercial developers, and others when using Green Infrastructure for stormwater management. This manual presents background and case studies for commercial development and municipal infrastructure projects. It also includes information on the use of Low Impact Development as an adaptation planning tool, and, in particular, as a means for building community resiliency in managing water resources.

The value of LID within the context of Forging the Link has three parts:

1. LID protects water quality, aquatic habitat and watershed health.
2. LID has demonstrated cost savings for developers and municipalities.
3. LID helps protect communities from threats of increased flooding through increased resiliency.

LOW IMPACT DEVELOPMENT BENEFITS FOR THE PROTECTION OF WATER QUALITY AND WATERSHED HEALTH

LID is widely recognized as a highly effective strategy for the protection of water quality and watershed health. The 2007 EPA Green Infrastructure Statement of Intent indicates a programmatic commitment to implementing Green Infrastructure as a means for protecting drinking water supplies, public health and reducing stormwater pollution. Also, the National Research Council (NRC) report entitled Urban Stormwater Management in the United States (2008) details the failings of the current standard of practice for both stormwater management and regulatory permitting. In particular, the NRC report identifies widespread urbanization, increases in impervious surface, nonpoint source derived pollution, and increased runoff volumes as the primary issues that need to be addressed. Remedies include the use of a combination of innovative stormwater management practices that are targeted at both pollutant and runoff volume reduction and through protection of buffers and undisturbed natural resources and public education.

FIGURE 1-1
An example of an effective Green Infrastructure element, Portland, Oregon

THE ECONOMIC BENEFITS OF GRAY AND GREEN INFRASTRUCTURE FOR STORMWATER MANAGEMENT

Less widely known are the potential economic benefits of using a combination of Green Infrastructure (or LID) and Gray Infrastructure (conventional) for stormwater management. LID is commonly misperceived as only adding expense to a project; however, this perspective fails to acknowledge the broader benefits that can be observed in terms of whole project costs for new construction, and in some instances, increased life-cycle benefits as well.

The misperception generally focuses on budget line item increases, such as the added expense associated with incorporating bioretention instead of standard landscaping, or the additional costs of utilizing porous pavements over traditional pavement.

While individually, Green Infrastructure elements will add expense to a project, at the same time, costs savings are often realized on an overall project basis as the need for conventional stormwater infrastructure such as curbing, catch-basins, piping, ponds, and other hydraulic controls are reduced.

Of course, cost savings are not observed when compared with a complete lack of stormwater management, but rather for projects consistent with new state and federal permitting requirements addressing volume and pollutant reduction. Basic stormwater management strategies such as ponds and swales are generally cheaper to design and install, but may not meet regulatory guidelines with respect to water quality treatment (Ballestero, 2006, NURP, 1999).

This project focuses on project costs that are typically the basis for most municipal budgeting decisions. LID structural controls will rarely be less expensive than minimal stormwater management and cost benefits may not be possible for retrofitting of existing stormwater man agement facilities. The greatest potential economic benefit exists for management of combined sewer overflow, which is often the single greatest municipal expense for communities that are required to separate stormwater and wastewater sewers. However, there are ecological services and benefits that provide cost savings by protecting adjacent and downstream abutters from property loss by storing and treating the water before it leaves the site.

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LID AS A CLIMATE CHANGE ADAPTATION PLANNING TOOL

> "Communities that actively engage in hazard and resiliency planning are less prone to disaster, recover faster from disasters which do occur, and endure less economic hardship than those communities that do not."

Another under-realized benefit to LID planning and LID structural controls is the ability to manage increased stormwater flows from a changing climate. The same strategies that are applied to managing increased runoff volume from impervious surfaces can be used to manage increased storm size from climate change. The use of Green Infrastructure for adding distributed storage and infiltration throughout a project can also have a cumulative positive effect in a watershed and be used as a climate change adaptation tool for building resiliency to extreme precipitation events. A 2010 report from the National Oceanic and Atmospheric Administration entitled Hazard and Resiliency Planning: Perceived Benefits and Barriers Among Land Use Planners identifies "communities that actively engage in hazard and resiliency planning are less prone to disaster, recover faster from disasters which do occur, and endure less economic hardship than those communities that do not." Preparedness includes an emphasis on non-structural controls such as land use planning and buffer protection, as well as structural controls like LID. Additionally, there is the potential for LID implementation to yield economic benefits by reducing the maintenance burden on existing municipal infrastructure and preventing the need for costly repairs and replacement while building community resilience to impacts from land use changes and climate change.

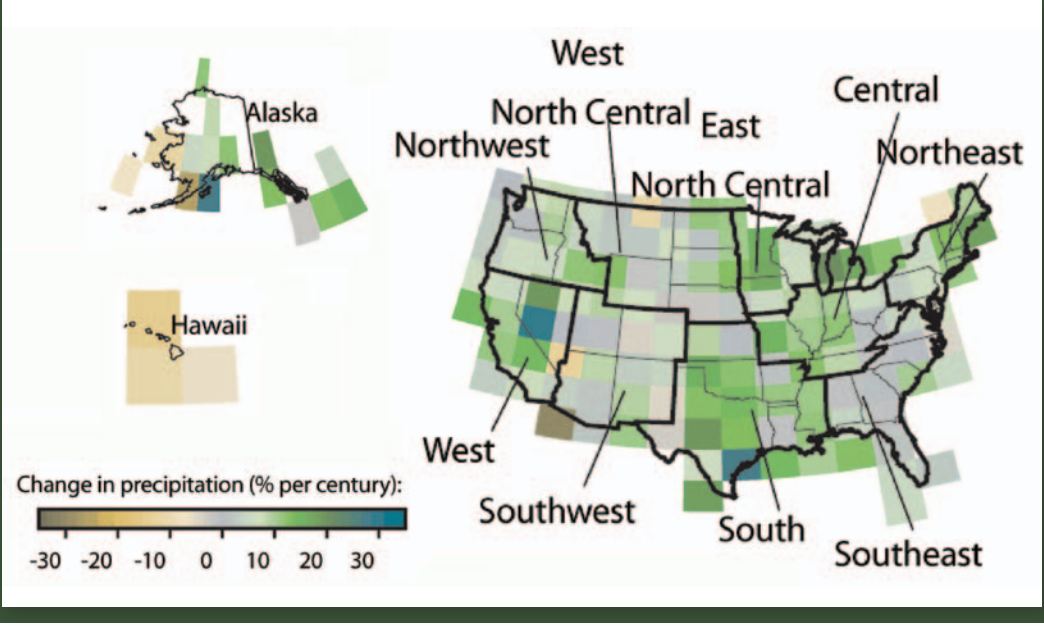

FIGURE 1-2
Climatic records for the US collected from 48 states since the early 20th century indicating increases in average precipitation (NOAA Climatic Data Center)