

# Low-Impact Development (LID) Principles

LID, also referred to as green stormwater infrastructure, is a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration by emphasizing conservation, use of onsite natural features, site planning, and distributed stormwater management practices that are integrated into a project design. Major LID Principles:

## Treat Stormwater On Site

Unlike conventional stormwater management practices that convey stormwater greater distances from urbanized areas and developed lots using drains, channels, and pipes to central treatment facilities like large stormwater ponds and underground holding tanks, LID manages stormwater onsite, close to where it falls to minimize the modification of the natural hydrologic cycle. Through small-scale, distributed facilities incorporated into a site's design, the flow of stormwater can be effectively managed to reduce impacts to surrounding properties.

## Minimize Impervious Surfaces

Hard and impervious surfaces such as roads, driveways, and parking lots prevent infiltration and increase the quantity, flow rate, and pollution of stormwater. Reducing a site's overall area of such surfaces, using permeable paving techniques, and increasing landscaped areas reduces stormwater runoff impacts.

## Minimize Site and Soil Disturbance

Stormwater is more readily absorbed and filtered by undisturbed soils than soils that have been compacted or removed during construction. Identifying and protecting areas of a project site that will be used to manage stormwater, prior to clearing, grading, and construction activities, as well as during occupancy, are critical to the successful implementation of LID best management practices.

## Conserve Vegetation

Trees, shrubs, and ground cover intercept stormwater. Native vegetation or landscape designs that consist of plant species that are highly adapted to the region's climate are highly effective at absorbing stormwater, reducing the flow of runoff, and reducing pollutants. Preserving a site's existing mature vegetation is a cost-effective approach to managing stormwater.



LID mimics pre-development hydrological conditions to manage stormwater.



Protected or amended soils more readily absorb stormwater than disturbed or compacted soils.



Porous concrete sidewalks allow stormwater to infiltrate on site.



Rain gardens and biofiltration are commonly used for treating stormwater on site.



Vegetated rooftops can help reduce stormwater flow rates.



Mature native or drought tolerant trees and ground cover plays a significant role in intercepting stormwater.

## Benefits of Low-Impact Development

Early stormwater management strategies focused on reducing localized flooding risk. Pipes conveyed stormwater runoff away from its source and into creeks, rivers, and the Puget Sound, but did little to protect these bodies of water from pollutants and debris. Practices such as building stormwater treatment and flow-control facilities have helped reduce — but not entirely eliminate — polluted runoff. LID can surpass conventional stormwater management techniques by reducing environmental impacts and infrastructure costs.

### LID Benefits include:

- The LID approach often results in infrastructure cost savings when compared with traditional catch basin, pipe, and pond strategies;
- Managing stormwater close to where it falls helps minimize modification of the hydrologic cycle;
- LID methods are attractive and can serve as amenities, adding both aesthetic and financial value to developments;
- Small-scale, distributed facilities reduce the flooding effects to downstream properties from flash storm events;
- Bioretention — an approved method of reducing the concentration of metals in stormwater — also offers flow reduction, additional landscaping, habitat, and reduction of other stormwater pollutants such as petroleum products, solids, and bacteria;
- LID helps protect local jobs involved in the shellfish and other aquatic-based industries.
- The use of natural features, such as native vegetation, results in increased habitat areas;

