

PROMOTING LOW IMPACT DEVELOPMENT IN YOUR COMMUNITY

Low Impact Development (LID) is an approach to stormwater management and site development that is gaining popularity throughout the country. Its attractiveness lies in its potential to lessen off-site stormwater impacts, reduce costs to municipalities and developers, and promote development that is “softer on the land” compared with typical traditional development. The approach, which is applicable to residential, commercial and industrial projects, and in urban, suburban and rural settings, often is linked with efforts by governments and citizens to foster more sustainable communities.

On the national and state levels, a focus in promoting LID to date has been on providing technical guidance on the approach – in the form of publications and training sessions. A tremendous amount of information on LID is now available online and elsewhere. While this is a positive development, the extent and detail of these resources can easily overwhelm public officials and citizens being introduced to the approach, especially those with non-technical backgrounds. If LID is to truly take hold in communities, there must be broad understanding of and support for the approach among local decision-makers and the public at large.



Installing Porous Pavement Parking, Freeport, Maine

This fact sheet is intended as a resource for those interested in promoting LID in their communities. It offers concise information on the approach and how to promote it, providing online links for users wishing to access more detailed guidance. It may be particularly helpful to professional municipal staff seeking to spread the word regarding LID. It is also geared to other LID proponents – whether they are volunteer members of town boards or local citizens.

The fact sheet is divided into three sections. The first section describes what LID is and its benefits. The second section list five general steps you can take to promote LID in your community. The final section provides five pointers for making your local ordinances more “LID friendly.”

WHAT IS LOW IMPACT DEVELOPMENT?

Low Impact Development (LID) is an approach to site planning, design and development that reduces stormwater impacts. LID aims to mimic pre-development run-off patterns, treat stormwater as close to its source as possible, preserve natural drainage systems and open space, and incorporate small-scale controls that replicate natural processes in detaining and filtering stormwater. LID uses the “divide and conquer” theory to treat relatively small amounts of stormwater and utilize it in beneficial ways. This contrasts with conventional stormwater management approaches geared to concentrating and collecting runoff and exporting it off-site as a waste product.

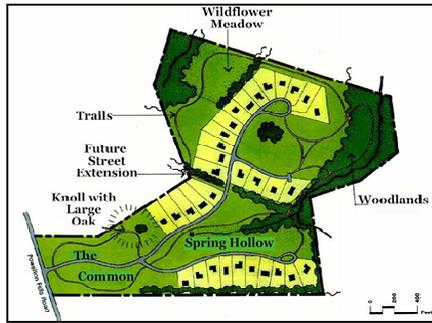


East End Community School Green Roof, Portland, Maine

Typical LID Techniques

LID Site Planning and Design:

Involves designing stormwater management systems that work with the site's natural hydrology, minimizing land disturbance, and locating buildings and other improvements in a sensitive manner. Conservation subdivisions and "clustering" are common approaches for achieving these objectives, but there are a number of other techniques that can be employed as well.



Reduced Impervious Surfaces: As part of site planning and design, finding opportunities for reducing new roads, parking areas and other impervious surfaces. This includes sharing of parking lots and driveways.



Permeable Paving: Where parking and drives are needed, using new products that allow rainwater to percolate into the ground while providing surface stability.



Bio-retention, also known as "rain gardens": Landscape features used to collect, treat, and infiltrate rainwater.



Vegetated Swales: Shallow drainage channels usually located adjacent to roadways (as an alternative to typical curb and gutter treatments) used to convey and filter stormwater.



Grassed Filter Strips: Low-angle vegetated slopes, usually located adjacent to parking areas and other large impervious surfaces, that slow flows and treat stormwater.



Green Roofs: Vegetated roof systems that capture rainfall and return it to the atmosphere.



Other LID measures exist that are well-suited to cold climates. An excellent summary of techniques can be found at the Massachusetts LID Toolkit at http://www.mapc.org/regional_planning/LID/LID_FAQs.html.

SUMMARY OF LID BENEFITS

- **Environmental Benefits:** Improved stormwater management, reduced impacts on wetlands, enhanced water quality (both surface and groundwater), better protection of ecological and biological systems, and preservation of open space.
- **Benefits to Municipalities:** Reduced costs for new or expanded infrastructure and for maintenance of stormwater structures.
- **Benefits to Developers:** Cost savings as a result of reduced infrastructure (extent of stormwater structures, streets, curbs, gutters) and less clearing and grading. Also increased marketability of lots and projects.

See *The Municipal Guide to Low Impact Development* http://www.toolbase.org/PDF/DesignGuides/Municipal_LID.pdf for a good overview of LID benefits.

5 THINGS YOU CAN DO PROMOTE LID IN YOUR COMMUNITY

LID makes good sense, but new ideas sometimes need help taking hold. Below are five general steps you can take to help promote LID in your community.

1. **Learn More about the Approach** (and become an **LID Advocate**)

Although Low Impact Development is gaining popularity, it is still a relatively new approach. Learning more about it and how it might best work in your community is a good first step, allowing you to become an informed advocate of the approach. A number of excellent websites – with information ranging from the general to the specific – now exist on LID, including:

- **Introduction to Low Impact Development.** Helpful FAQs and other information from the Low Impact Development Center. <http://www.lid-stormwater.net/intro/background.htm>
- **Municipal Guide to Low Impact Development.** A good 2-page summary of LID benefits and principles. http://www.toolbase.org/PDF/DesignGuides/Municipal_LID.pdf
- **Massachusetts Low Impact Development Toolkit.** Contains a suite of materials focused on LID techniques. <http://www.mapc.org/LID.html>
- **The Practice of Low Impact Development.** An in-depth treatment of LID techniques from U.S. HUD. <http://www.huduser.org/Publications/PDF/practLowImpctDevel.pdf>



You can also learn more about the approach at one of the LID conferences or training sessions which are periodically held in Maine, Northern New England and elsewhere. View the following sites for upcoming LID and stormwater-related events:

- Maine DEP – *Nonpoint Source Training and Resource Center* page: <http://www.maine.gov/dep/blwq/training/index.htm>
- Mass Coastal Zone Management Office – *Coastal Calendar* page: <http://www.mass.gov/czm/calendar.htm>
- Stormwater Authority – *Events/Education* page: http://www.stormwaterauthority.org/events_education

2. **Spread the Word** (particularly to those who will be most involved in LID decision-making).

Once people learn about the multiple benefits of LID, they often become strong advocates themselves. You can help spread the word in several ways:

- Inform people about the approach in general and pass along good websites (including this one) and upcoming training sessions either informally or through targeted outreach efforts.
- Request a presentation from Maine NEMO (Nonpoint Education for Municipal Officials) to the officials in your town. Contact LaMarr Cannon, NEMO Coordinator at 207-771-9020, or lcannon@maine.rr.com.
- Make your own presentation: Several good introductory PowerPoint presentations are available online, which you can adapt for your own use. Try the following:
 - ☑ From Buzzards Bay Estuary Project: <http://www.buzzardsbay.org/download/2-11-04lidshow.pdf>
 - ☑ From Mass Low Impact Development Toolkit: http://www.mapc.org/regional_planning/LID/LID_Toolkit_Slide_Show.ppt
- Hold ongoing discussions: Once people and groups are familiar with the approach, it is important to discuss details how the approach can best be applied and promoted in the community.



<http://www.mainenemo.org>

Since the citizens of your community will have a strong bearing on whether LID takes hold in your community – both as they weigh in on possible ordinance changes to promote the practice or as neighbors to proposed projects – conducting outreach efforts to the general public is an excellent idea. Also, there are three groups within your municipal government that may deserve particular attention as you spread the word:

- **Planning Board members:** By acquainting board members with LID principles and techniques, they will be more likely to respond positively to the approach when it is proposed, and even become strong advocates for its use in applicable situations.
- **Public Works and Public Safety Departments:** LID techniques are sometimes viewed skeptically by public works or public safety departments because they represent a departure from long-established practices governing stormwater control, or roads, access and parking. Holding upfront meetings to discuss such concerns is helpful.
- **Selectmen/Councilors/Managers:** It is also a good idea to familiarize elected officials and municipal administrators with LID since they will be involved in the process of revising ordinance standards or needing to respond to citizen inquiries regarding the approach.

3. Reach Out to Developers

Many communities are recognizing the benefits of establishing stronger working relationships with developers in fostering more sustainable development practices. Low impact development represents an excellent opportunity for such cooperation. Both in one-on-one interactions and as part of organized group gatherings, developers can be acquainted with the approach and its benefits, and encouraged to integrate LID features into proposed projects.

In talking with developers and organizing outreach efforts, two issues deserve particular attention. The first is the cost of implementing LID approaches. Although LID often is touted for its cost-saving benefits, developers may need assurances that the approach makes economic sense. Several websites provide useful information in this regard:

- **Builders’ Guide to Low Impact Development**
http://www.toolbase.org/PDF/DesignGuides/Builder_LID.pdf#search=%22a%20builder's%20guide%20to%20low%20im pact%20development%22
- **LID Strategies and Tools for Local Governments: Building a Business Case**
http://lowimpactdevelopment.org/lidphase2/econ_assess.htm

The second issue has to do with the receptiveness of town boards and of the community at large. Before proposing an LID project, developers may want see positive indications of support for the approach among town officials and citizens. Such support may be evident as a result of your successful efforts in spreading the word about LID or by making ordinance changes to better accommodate the approach. Developers themselves can build understanding and support for LID though neighborhood meetings and pre-development workshops.

	Conventional	Low Impact
Grading/Roads	\$569,698	\$426,575
Storm Drains	\$225,721	\$132,558
SWM Pond/Fees	\$260,858	\$ 10,530
Bioretention/Micro	—	\$175,000
Total	\$1,086,277	\$744,663
Unit Cost	\$14,679	\$9,193
Lot Yield	74	81

Example of Construction Cost Analysis of Conventional versus LID Development

4. Get Projects on the Ground

A completed project that employs LID principles and techniques is a powerful public education tool for promoting the approach. There's nothing like having a successful project to help to convert skeptics and galvanize supporters. If a project is constructed in your community or region, work to publicize it and use it as a learning experience that can be built upon.

If private LID projects are slow in coming to your community, consider integrating LID features into municipal projects. New school facilities or improvements may be a particularly good opportunity, as they are high visibility, and can incorporate an educational component.

Opportunities may also exist for the formation of partnerships in which multiple organizations propose or finance LID-oriented projects. One example would be a non-profit housing organization, which is able to partner with an environmental funder to help cover the cost of LID features.

Several small-scale projects incorporating LID techniques have been constructed or are in the planning stages in Maine. Two recent projects involved the installation of a green roof at East End School in Portland and the use of porous pavement for the parking lot at the Freeport Community Center. The following sites describe LID projects in other states:

- **National LID Clearinghouse.** A listing of projects nationwide with additional links. <http://www.lid-stormwater.net/clearinghouse/effectiveness.htm>
- **NEMO LID Stormwater Treatment Practice Database.** Excellent listing of LID projects in Connecticut. <http://www.clear.uconn.edu/tools/lid/index.htm>
- **Mass Smart Growth Toolkit.** Three case studies in the Bay State. http://www.mass.gov/envir/smart_growth_toolkit/pages/SG-CS-lid.html
- **Greenroofs.com.** A listing of green roof projects. <http://www.greenroofs.com/projects/plist.php>

5. Make Sure Your Local Ordinances are "LID-Friendly"

If the land use ordinances of your city or town currently prohibit or discourage certain LID practices, it is doubtful that your community will get many proposals for developments incorporating them. On the other hand, if your ordinances contain provisions that not only allow, but also promote the approach, LID projects are much more likely to be proposed and built. Because of the importance of this consideration, a separate "Top Five" fact sheet follows this one.



Portland Water District Rain Garden Demonstration Project, Standish, Maine



Pervious Gravel Parking area Kittery, Maine

5 THINGS YOU CAN DO PROMOTE LID IN YOUR LOCAL ORDINANCES

Local ordinances are often identified as an impediment to LID. In some cases, ordinances prohibit or discourage certain LID techniques. Perhaps more commonly, ordinances are silent on the approach, leaving planning boards and developers to rely on the “conventional” approaches to stormwater or site design. A fairly comprehensive checklist for evaluating ordinances can be found in the Massachusetts LID Toolkit at http://www.mapc.org/regional_planning/LID/LID_codes.html. The following Top 5 list offers more concise guidance with an eye toward typical land use ordinances in Maine.

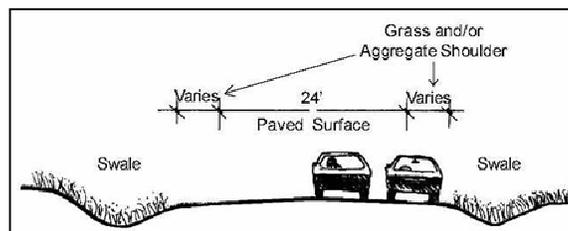
1. Make Sure They Don't Prohibit/Discourage LID Measures

A first step is ensuring that LID techniques aren't prohibited or discouraged in your ordinances – either explicitly or implicitly. Try reviewing the six LID techniques described on page 1 (or other ones described in LID literature), and evaluate how your ordinances would treat proposals using each technique. Although you may discover outright prohibitions on certain measures (for example, not allowing pervious pavement treatments in commercial parking areas), be attuned to provisions that may act to discourage LID features – such as treating them as structures that must meet setback requirements or not allowing them to be accounted for in determining required areas for landscaping or open space.

2. Revise Street and Parking Standards to Reduce Impervious Surfaces

LID's focus on reducing impervious surfaces often runs afoul of local ordinances. These ordinances set minimum standards, that, while intended to ensure adequate traffic circulation, parking and access for public safety vehicles, can result in excessive paving, at least for certain types of projects or improvements.

Consider reevaluating your ordinance standards that dictate the size of roads, drives and parking areas. The goal should not be to look solely at pavement reduction, but on ways that circulation, safety and parking needs can be approached in a balanced fashion. Areas that deserve particular attention include:



*Example of Reduced Pavement Width
for low volume streets*

- Required pavement widths on residential streets. Consider allowing widths of 24 feet or less for these streets (18-22 feet may be a reasonable standard for low-volume streets). For a good discussion of both street width and design, see http://www.metrocouncil.org/Environment/Watershed/BMP/CH3_RPPImpStreet.pdf
- The turning radius for cul-de-sacs. Reducing the radius of a cul-de-sac from 40 feet to 30 feet, for example, yields a 45% reduction in paved surface. Emergency vehicle access should be a consideration, but should be balanced with other objectives. See excellent discussion at http://www.metrocouncil.org/environment/Watershed/BMP/CH3_RPPImpCuldeSac.pdf
- Standards governing number of parking spaces. If your ordinance requires more than 3 spaces per 1,000 square feet of gross floor areas for offices, and 4.5 spaces per 1,000 square feet of gross floor area for retail, consider reducing these standards.
- Other Opportunities for More Efficient Parking Areas. In evaluating parking standards and making changes, take into account the availability of on-street-parking and excess parking capacity in the vicinity, as well as opportunities for allowing smaller spaces for compact cars and shared parking among businesses with different peak use profiles.

3. **Pay attention to Street and Parking Lot Layout and Design**

Besides allowing for the reduction of paved areas, your local ordinances can promote design of roads and parking areas that incorporate a decentralized approach to stormwater management consistent with LID principles. Three good examples of this are:

- Using of vegetated swales as an alternative to curbs and gutters. Typical ordinance provisions either mandate or strongly promote curb and gutter profiles for streets, which serves to concentrate stormwater and increase its velocity. Consider adopting provisions that allow or encourage “open section” roadways that utilized vegetated swales, especially for more rural projects.
- Incorporating LID measures into parking lot design and landscaping. Ordinance language can also be revised to promote breaking up large paved expanses into multiple parking areas punctuated with natural vegetation and bio-retention areas. If your ordinances now require parking areas to be paved, consider allowing use of permeable paving treatments as well. To build familiarity with the approach, your ordinance might be revised to require porous paving for overflow parking areas.
- Installing rain gardens into cul-de-sac design. Cul-de-sac islands, in conjunction with open curb treatments, can serve as infiltration areas for the paved areas that surround them.



4. **Incorporate LID Site Planning/Design Principles (including promotion of conservation subdivisions)**

Some of the best opportunities for creating low impact projects occur at the site planning and design stage. By careful attention to natural features, drainage patterns and the placement of buildings and improvements, projects can be made to work with, rather than against, the site’s existing hydrology. Your ordinances can help promote this approach to site planning and design.

Conservation subdivisions are an approach to site planning and design that can facilitate LID objectives as well as provide other benefits. At the very least, your ordinances should allow for the somewhat modified review process needed to facilitate these projects, and the flexibility to allow clustering of buildings or lots to create open space. Ideally, your ordinance should require or

strongly encourage conservation subdivisions. The Town of Freeport, for instance, has adopted standards requiring significant open space set asides in most cases. Scarborough requires cluster development based on wetland impacts. Their ordinance is available online. Rockport’s gives 1.3 density bonus to developers doing Open Space subdivisions. A wealth of online resources exist on conservation subdivisions. A particularly good reference for those who are unfamiliar with or have concerns about the approach is a resource developed by *Land Choices* at <http://www.landchoices.org/ConservationSubdivisions.htm>.



Example of Conservation Subdivision focusing on retention of natural features

Even projects that don’t involve lot size reductions or clustering can be designed to better meet LID objectives. Your ordinances may already contain standards such as minimizing site disturbances and retaining natural features. Such provisions can be given more teeth by requiring mapping of significant natural features or submission of tree preservation plans. Preapplication conferences or “sketch plan” meetings represent an excellent opportunity to discuss project planning and design issues – consider adding more guidance in your ordinances regarding expectations and submittals for this stage of the process.

5. Add Additional LID-promoting Provisions to Your Ordinances

Steps 1-4 above are geared to making relatively modest changes to your ordinances to better accommodate LID development. If your community wants to not only allow, but to more strongly encourage LID techniques, you may want to consider the adoption of additional ordinance language that promotes or provides more guidance on the approach.

Guideline: this step should be taken with careful deliberation. When it comes to adding language on LID to your ordinances, you are generally better off selectively incorporating principles and general standards of performance that are likely to be well understood and applied – as opposed to the bulk adoption of pages of detailed design specifications of various LID techniques and practices.

If adopting a new ordinance is the route you want to take, it's usually preferable to adopt a comprehensive integrated stormwater management ordinance that includes LID principles and standards and which applies to all projects covered by other ordinances (e.g. zoning, subdivision, site plan and shoreland). Another option is to integrate LID provisions into existing stormwater regulations that are likely to be located in your town's land use ordinance. If you want to provide additional design specifications, consider adopting a technical appendix to your ordinance. Your planning department or board can also maintain links to LID manuals to assist developers and others who want detailed guidance.

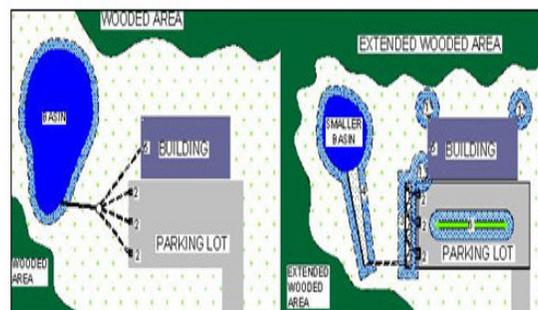


Illustration from DEP Stormwater BMP Manual showing LID alternative to typical commercial development

The following resources may be helpful as you consider incorporating additional LID language or conducting a more global evaluation of your ordinances prior to beefing them up to better address stormwater management and water quality protection as a whole:

- **Massachusetts Model LID Bylaw**. Not recommended in Maine for wholesale adoption, but has elements that may be adapted, particularly its approach to awarding credits for use of LID approaches, as laid out in a technical appendix. http://www.mass.gov/envir/smart_growth_toolkit/bylaws/LID-Bylaw.pdf.
- **Maine Stormwater Best Management Practices Manual**. The chapters on LID as a stormwater management approach are a source of both excellent information and principles/standards that might be integrated into local ordinances. Chapters on LID technical practices may be more appropriate as an ordinance appendix or reference. <http://www.maine.gov/dep/blwq/docstand/stormwater/stormwaterbmps/index.htm>
- **Codes and Ordinance Worksheet** (from handbook. “Better Site Design: A Handbook for Changing Development Rules in Your Community” published by Center for Watershed Protection). Useful in conducting an overall assessment of your ordinances, with a focus on how well they protect water quality. http://www.cwp.org/COW_worksheet.htm.
- **Municipal Regulation Checklist** (from NJ Stormwater BMP Manual). Another evaluative tool, with a focus on integrating LID provisions into ordinances. http://www.njstormwater.org/tier_A/pdf/NJ_SWBMP_B.pdf

Finally, keep an eye out for new resources focused on promoting LID in your local regulations. The State of Maine is in the process of developing a model LID ordinance. Contact the Land Use Team at the State Planning Office for details: <http://www.state.me.us/spo/landuse/aboutus>. Your regional planning councils may also be a good resource, especially on which communities in your region are active in promoting LID and other stormwater approaches. A listing of Maine Regional Councils can be found at: <http://www.maine.gov/spo/landuse/techassist/regcouncil.php#map>.

Photo Credits: Maine NEMO: Center for Watershed Protection; Metropolitan Area Planning Council; Stephen Blatt Architects; and Zach Henderson, Hilliard & Associates.