

**REPORT OF THE
DEPARTMENT OF CONSERVATION AND RECREATION
AND THE DEPARTMENT OF ENVIRONMENTAL QUALITY**

Final Report of the Low Impact Development Assessment Task Force

**TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA**



HOUSE DOCUMENT NO. 103

**COMMONWEALTH OF VIRGINIA
RICHMOND
2005**



COMMONWEALTH of VIRGINIA

MEMORANDUM

November 15, 2005

TO: The Honorable Members of the General Assembly

RE: Final Report of the Low Impact Development Assessment Task Force [Prepared by the Department of Conservation and Recreation and the Department of Environmental Quality]

Chapter 738 of the 2003 Virginia Acts of Assembly (HB1953) called for the Department of Environmental Quality (DEQ) to establish a Low Impact Development Assessment Task Force to facilitate discussions regarding Low Impact Development (LID). In 2004, with the passage of Chapter 372 of the 2004 Virginia Acts of Assembly (HB1177), the General Assembly consolidated Virginia's stormwater management programs within Department of Conservation and Recreation (DCR) and provided comparable direction to DCR for enabling the promotion and incorporation of LID concepts in the management of rain runoff and infiltration. Accordingly, DCR, with agreement by DEQ, has taken leadership of the Task Force.

The individuals participating in the Task Force represented the diversity of stakeholders involved in LID and their hard work has resulted in much progress toward meeting the objectives of HB1953 and furthering the use of the LID concept. LID holds much promise for advancing Virginia's efforts to manage stormwater runoff and protect our valuable water resources.

We appreciate your consideration of this final report and look forward to a continuing dialogue on this important issue.

Respectfully submitted,

Handwritten signature of Joseph H. Maroon in black ink.

Joseph H. Maroon
Director,
Department of Conservation
and Recreation

Handwritten signature of Robert G. Burnley in black ink.

Robert G. Burnley
Director,
Department of Environmental
Quality

Attachment

cc: The Honorable W. Tayloe Murphy, Jr.
Members of the Low Impact Development Assessment Task Force

LOW IMPACT DEVELOPMENT ASSESSMENT TASK FORCE

Participant	Agency or Organization
Doug Beisch	Williamsburg Environmental Group
Linda Cole	Department of Navy
Martha Little	Chesapeake Bay Local Assistance Department (prior to merger into DCR)
Barry Fitz-James	Virginia Association of Counties
Jack Frye	Department of Conservation and Recreation
Ellen Gilinsky	Department of Environmental Quality
Ron Hamm	Low Impact Development Coalition
Joe Lerch	Chesapeake Bay Foundation
Helene Merkel	Home Engineering
Rachel Morris	Virginia Farm Bureau Federation
Jeff Perry	Virginia Municipal League
Ken Smith	Virginia Department of Transportation
Bill Springer	Home Builders Association of Virginia
Richard Street	Virginia Association of Soil and Water Conservation Districts
John Tippet	Friends of the Rappahannock
Bruce Williams	U.S. Army Corps of Engineers

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EXECUTIVE SUMMARY

This final report, prepared by the Department of Conservation and Recreation and the Department of Environmental Quality on behalf of the Low Impact Development Assessment Task Force, provides an introduction to the concept and practices of low impact development (LID). In addition, the report discusses the consolidation of the Commonwealth's stormwater management programs and the resulting impact on the role and implementation of LID.

LID was developed in response to the shortcomings of conventional stormwater management technology and involves the use of a system of strategically placed, smaller – scale, distributed stormwater management techniques through which we can replicate, replace, or mimic the filtering, storage, and infiltration processes that are critical for maintaining the function of the watershed.

The consolidation of the Commonwealth's stormwater management programs provides an opportunity for broad incorporation of LID principles and stormwater management principles throughout the development community. This report outlines actions underway by the Department of Conservation and Recreation and other agencies and individuals to meet the LID requirements of stormwater management per Chapter 738 of the 2003 Virginia Acts of Assembly (HB1953) and Chapter 372 of the 2004 Virginia Acts of Assembly (HB1177).

The report concludes that LID evaluation and use in Virginia is well underway and that the understanding of its applications will increase every year. Benchmarks include:

- Several localities are using LID techniques and others are testing LID practices in their efforts to manage stormwater.
- State agencies, such as VDOT, are considering LID in the design of projects.

- The Department of Environmental Quality and the U.S. Army Corps of Engineers are promoting the use of LID as a means of demonstrating that wetland impacts have been avoided and minimized.
- Additionally, the U.S. Army Corps of Engineers is promoting the use of LID as a mitigation tool for water quality impacts due to development.
- The consolidation of the Commonwealth's stormwater management programs should result in additional implementation of LID as DCR develops stormwater regulations that encourage the use of low impact development designs in stormwater management projects.
- The completion of this report concludes the work of the Task Force with the recognition that the promotion and use of LID has and will continue to expand.

INTRODUCTION TO LOW IMPACT DEVELOPMENT (LID)¹

Land development and construction can result in significant landscape alteration that can affect runoff and water quality. Soils are compacted by construction equipment and grading. In addition, trees and vegetation are replaced by extensive areas of impervious surface. Compacted soils and impervious surfaces cannot effectively infiltrate water and there is less vegetation to soak up, store, and evaporate water. Groundwater recharge is also reduced. The result is an increase in the volume of runoff (i.e. less water soaks into the ground and more runs off). The quality of runoff may be altered, resulting in increased water temperature and in the amount of sediment and pollutants reaching receiving streams. Without sufficient stormwater management planning, fish and wildlife habitat in the streams that receive runoff from developed areas may be degraded.

Traditional stormwater management techniques have been designed to control larger and less frequent storm events, sometimes providing inadequate protection for the health of the watershed. Most traditional systems are designed to remove water from a site quickly and efficiently, limiting opportunities for filtering of pollutants, reducing the volume of runoff, or recharging groundwater. Other problems or perceived problems with conventional stormwater practices include health risks such as habitats for mosquitoes and other disease-carrying organisms, significant long-term maintenance costs, and safety risks.

The concept of low impact development, or LID, was developed in response to the shortcomings of conventional stormwater management technology. By incorporating a system of strategically placed, smaller-scale, distributed storm water management techniques, we can replicate, replace, or mimic the filtering, storage, and infiltration processes that are critical for maintaining the function of the watershed.

¹ The information in this section comes primarily from an LID brochure prepared jointly by the Friends of the Rappahannock and the Low Impact Development Center with funds provided by the US EPA Chesapeake Bay Program and the National Fish and Wildlife Foundation.

LID has successfully been incorporated into many local government stormwater management programs in the Chesapeake Bay region and throughout the United States.

The Virginia Stormwater Management and Erosion and Sediment Control regulations allow for the use of LID techniques and practices. The use of LID is being promoted by the Department of Conservation and Recreation (DCR) as an alternative and supplement to existing stormwater programs. The Department of Environmental Quality and the U.S. Army Corps of Engineers are promoting the use of LID as a means of demonstrating that the wetland impacts have been avoided and minimized. Additionally, the U.S. Army Corps of Engineers is promoting the use of LID as a mitigation tool for water quality impacts due to development.

The type and amount of conservation practices that can be used in an LID design are up to the local community. LID landscaping features, such as bioretention areas, green roofs, soil amendments, or revegetation can make development as a whole more attractive and increase the appeal of individual properties as well. Simple restrictive covenants or homeowners agreements may help to ensure that features are properly maintained.

Examples of LID practices include the following:

Conservation of natural site assets

Site planning with low impact development (LID) techniques begins with developing strategies to conserve the natural hydrologic assets and functions of a site. LID site conservation techniques include (but are not limited to) directing development away from sensitive environmental areas, preserving native vegetation and soils, maintaining existing drainage courses, and minimizing the extent of impervious areas.

Directing runoff through natural areas

Natural wooded areas are extremely effective groundwater recharge areas. The best way to recharge wetlands and drinking water aquifers is through these vegetated areas. An LID approach creates opportunities to retain as much runoff as possible on site. Stormwater is filtered and infiltrated into the ground by directing runoff away from impervious areas and engineered drainage systems and into areas of natural vegetation.

Small-scale distributed stormwater controls

LID uses a decentralized stormwater management system of small-scale controls that are located near the sources of runoff generation. These controls are designed to store, infiltrate, filter and release runoff the way natural areas do. Because LID features are small, a variety of opportunities can be found on a site to filter pollutants and control the volume and peak runoff rates of stormwater.

Customized site design

LID requires the designer, developer, and reviewer to work closely together to insure that the site design and construction plans protect the hydrologic functions and assets of the property. The designer must incorporate the overall watershed and basin planning strategies into the site design to ensure that the overall watershed protection objectives are met.

Maintenance

The following excerpt from the executive summary of *Low Impact Development (LID): A Literature Review* (prepared by USEPA and the Low Impact Development Center) accurately characterizes the maintenance issues related to LID techniques:

Maintenance issues can be more complicated than for conventional stormwater controls because the LID measures reside on private property. In most instances, homeowners agree to only the first year of maintenance.

Homeowner associations could be a mechanism for providing long-term maintenance to these areas. Generally, bioretention facilities require replacement of dead or diseased vegetation, remulching as needed, and replacement of soils after 5-10 years. Grass swales require periodic mowing and removal of sediments. Maintenance of permeable pavements requires annual high-powered vacuuming of the area to remove sediments.

TASK FORCE GOALS

Chapter 738 of the 2003 Virginia Acts of Assembly (HB1953) (Appendix of this report) amended the Code of Virginia by adding a section numbered 10.1-1186.5. This section created the Low Impact Development Assessment Task Force and identified the responsibilities of the task force in subsection B. The responsibilities of the task force were:

- (i) Develop a certification process for low impact development techniques in achieving quantifiable pollution prevention or abatement results,
- (ii) Develop such other guidance for local governments and the general public as necessary to promote a more complete understanding of the most effective use of low impact development techniques,
- (iii) Recommend changes to existing statutes and regulations to facilitate the use of low impact development techniques, and
- (iv) Develop a model ordinance for use by local governments.

STORMWATER MANAGEMENT PROGRAM CONSOLIDATION

The passage of Chapter 372 of the 2004 Virginia Acts of Assembly (HB1177) by the General Assembly consolidates the Commonwealth's stormwater management programs into the Department of Conservation and Recreation. Section 10.1-603.4.8 of the Act states that DCR is to encourage low impact development designs, regional and watershed approaches, and nonstructural means for controlling stormwater. In addition, §10.1-603.3.D of the Act directs DCR to develop a model ordinance for establishing a local stormwater management program.

As a result of the consolidation, DEQ and DCR agreed that the responsibility for the activities required by Chapter 738 (HB1953) should be transferred to DCR.

DCR reviewed the previous work of the task force and its responsibilities in light of the stormwater consolidation.

As a result, work by DCR staff and the LID Workgroup lead by the U.S. Army Corps of Engineers was deemed sufficient to meet the responsibilities outlined above and no further Low Impact Development Task Force meetings of the committee established by Chapter 738 of the 2003 Virginia Acts of Assembly (HB1953) were scheduled.

SUMMARY OF LID ACTIVITIES

- (i) Develop a certification process for low impact development techniques in achieving quantifiable pollution prevention or abatement results.
 - A draft Low Impact Development (LID) Technical Bulletin has been created by the Low Impact Development Workgroup lead by the U.S. Army Corps of Engineers. This LID Technical Bulletin will contain technical guidance and information for site plan designers, plan reviewers, developers, public officials and others interested in implementing Low Impact Development in Virginia.

Examples of some of the information contained in the draft LID Technical Bulletin include a statewide definition of LID, a discussion of various LID design components, a discussion on the applicability of LID, information on acceptable LID computational methods, guidance relating to proper LID construction and maintenance, positive LID examples in Virginia, and a list of publications, references and websites that will provide additional LID information. The U.S. Army Corps of Engineers LID Workgroup completed the draft LID Technical Bulletin in February 2005.

- DCR administers a training and certification program in accordance with the Erosion and Sediment Control Certification Regulations (4VAC50-50) for program administrators, inspectors, plan reviewers and combined administrators.
 - DCR is presently considering revising the training classes and certification exams to incorporate LID principles and practices with a targeted completion date of January 2006.
- (ii) Develop such other guidance for local governments and the general public as necessary to promote a more complete understanding of the most effective use of low impact development techniques,
- A LID compact disc (CD) was developed by the Friends of the Rappahannock, with funding support from DCR, as LID guidance for local governments and the general public. The CD, “Low Impact Development: A Tutorial and Toolkit”, is a comprehensive resource for elected officials and community leaders as well as engineers and planners. The CD includes an educational Powerpoint Presentation with audio, LID manuals, site design checklist, LID calculation worksheets, examples of LID codes and ordinances in Virginia, brochures and other reference information. DCR has distributed over 1000 copies of this CD to local contacts throughout Virginia.

- DCR, with federal funding through the EPA Chesapeake Bay Program office, currently implements a grant program that specifically targets LID demonstration projects within Virginia's Chesapeake Bay watershed. LID practices implemented through the demonstration projects range from retrofitting existing sites, incorporation of LID approaches into multiple acre new construction sites, redesign of conventional stormwater plans, and construction of innovative practices such as green roofs. DCR has funded forty projects to date and each project is intended to serve as an LID demonstration site for the Commonwealth. Project sponsors include local governments, planning district commissions, soil and water conservation districts, and nonprofit organizations.
- A Virginia LID Web Tour is in development as a resource for professionals interested in identifying existing projects that currently utilize LID practices and approaches. The web tour has been designed to catalogue each LID project throughout the Commonwealth based on their location, development type (residential or commercial), and type of practice(s) installed. A one-page template is used to present general information on each site and LID practice(s), including an image and useful details regarding construction, lessons learned, monitoring and maintenance as well as a contact person for more information.
- DCR is working with the EPA Chesapeake Bay Program and other Chesapeake Bay Partners to form an LID research consortium of several academic institutions and state agencies. The purpose of the consortium will be to identify funding mechanisms for LID research and to facilitate better communication related to LID issues. Some of the academic partners included in the LID research consortium are the University of Virginia, Villanova University, North Carolina State University, and the University of Maryland.

- DCR will update the 1992 Virginia Erosion and Sediment Control Handbook and the 1999 Virginia Stormwater Management Handbook as a result of the consolidation of the stormwater management programs. The revision of each manual will contain LID standards, LID specifications and any additional technical guidance necessary to implement LID statewide. The revision of the handbooks is expected to be completed by July 2007.
 - DCR is completing development of an Advanced Plan Reviewer Course for plan reviewers, site designers, local officials and others interested in complying with Virginia Stormwater Management Law and Regulations and Virginia Erosion and Sediment Control Law and Regulations. The course is presently under review and will be revised to include an educational component on LID. This module will provide additional guidance on LID implementation. The guidance will be based on the approved Virginia LID Technical Bulletin. The revised course is scheduled for offering in January 2006.
- (iii) Recommend changes to existing statutes and regulations to facilitate the use of low impact development techniques, and
- The passage of Chapter 372 of the 2004 Virginia Acts of Assembly (HB1177) by the General Assembly consolidated the Commonwealth's stormwater management programs. Section 10.1-603.4.8 of the bill states that regulations are to be developed that encourage low impact development designs. Therefore, Chapter 372 provided the state with the means to encourage and support low impact development techniques on a statewide basis.
 - DCR is working with James City County officials, builders, and citizens along with the Center for Watershed Protection, the EPA's Chesapeake Bay Program, and the Alliance for the Chesapeake Bay to improve James City County's land development ordinance. The improved ordinance will facilitate the use of LID techniques.

- The process used in James City County can be used as a positive example to help guide other localities interested in the effective use of LID. DCR will promote this evaluation process statewide.
- (iv) Develop a model ordinance for use by local governments
- Chapter 372 of the 2004 Virginia Acts of Assembly (HB1177) requires DCR to develop a model ordinance for a local stormwater management program. A draft model ordinance for LID has been created by the workgroup lead by the U.S. Army Corps of Engineers. DCR will consider the draft LID ordinance as the beginnings of a stormwater management ordinance template during the development of the required model ordinance. Local governments will utilize the DCR model ordinance to effectively address LID and other stormwater related issues. The draft model ordinance is targeted for completion in 2005.

CONCLUSION

LID evaluation and use in Virginia is well underway and the understanding of its applications will increase every year. Benchmarks include:

- Several localities are using LID techniques and others are testing LID practices in their efforts to manage stormwater.
- State agencies, such as VDOT, are considering LID in the design of projects.
- The Department of Environmental Quality and the U.S. Army Corps of Engineers are promoting the use of LID as a means of demonstrating that wetland impacts have been avoided and minimized.

- Additionally, the U.S. Army Corps of Engineers is promoting the use of LID as a mitigation tool for water quality impacts due to development.
- The consolidation of the Commonwealth's stormwater management programs should result in additional implementation of LID as DCR develops stormwater regulations that encourage the use of low impact development designs in stormwater management projects.
- The completion of this report concludes the work of the Task Force with the recognition that the promotion and use of LIS has and will continue to expand.

APPENDIX

Chapter 738, 2003 Virginia Acts of Assembly (HB1953)

VIRGINIA ACTS OF ASSEMBLY – 2003 SESSION

CHAPTER 738

An Act to amend the Code of Virginia by adding a section numbered 10.1-1186.5, relating to low impact development.

[H 1953]

Approved March 19, 2003

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding a section numbered 10.1-1186.5 as follows:

§ 10.1-1186.5. Creation of the Low Impact Development Assessment Task Force.

A. The Director of the Department shall appoint a Low Impact Development Assessment Task Force. The task force shall operate as an entity within the Department. The task force shall have 11 members appointed by the Director and shall include a representative of the Department of Conservation and Recreation, of the Chesapeake Bay Local Assistance Department, the Chesapeake Bay Foundation, the Virginia Farm Bureau Federation, the Home Builders Association of Virginia, the Low Impact Development Coalition, the Virginia Association of Counties, the Virginia Municipal League, and three citizen members not affiliated with the organizations designated in this subsection.

B. The task force shall (i) develop a certification process for low impact development techniques in achieving quantifiable pollution prevention or abatement results, (ii) develop such other guidance for local governments and the general public as necessary to promote a more complete understanding of the most effective use of low impact development techniques, (iii) recommend changes to existing statutes and regulations to facilitate the use of low impact development techniques, and (iv) develop a model ordinance for use by local governments.

C. The task force shall submit a preliminary report to the Director by October 1, 2003, and a final report to the Director by October 1, 2004. The Director shall report to the General Assembly on the activities and recommendations of the task force by November 1 of each year in which he receives a report.

D. For purposes of this section, "low impact development" means a site-specific system of design and development techniques that can serve as an effective, low-cost alternative to existing stormwater and water quality control methods and that will reduce the creation of storm runoff and pollution and potentially reduce the need to treat or mitigate water pollution.

2. That the provisions of this act shall be effective until submission of the final report.