

Low Impact Development

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Articles

DeLaria, Michelle. 2008. "Low Impact Development as a Stormwater Management Technique." Rocky Mountain Land Use Institute Sustainable Community Development Code Research Monologue Series: Environmental Health and Natural Resources.

- Defines stormwater management and LID; includes strategies on how to integrate LID strategies into local land use codes.

Foss, Asa. 2005. "Low Impact Development: An Alternative Approach to Site Design." *PAS Memo*, May/June.

- Provides an overview of LID's four areas of emphasis: stormwater management, wastewater management, circulation design, and site design, along with examples of incorporating LID into practice.

Guillette, Anne. 2008. "Achieving Sustainable Site Design through Low Impact Development Practices." National Institute of Building Sciences Whole Building Design Guide, www.wdbg.org.

- Discusses LID site design goals, strategies, and the site planning process; suggests LID technologies for different levels of water conservation.

Nisenson, Lisa. 2006. "Integrating Stormwater Regulation and Urban Design." *Zoning Practice*, November.

- A primer on EPA rules requiring the integration of stormwater management with local planning and zoning efforts.

Weinstein, Noel and John Tippet. 2003. "Low Impact Development Strategies for Rural Communities." Paper presented at National Conference on Urban Stormwater: Enhancing Programs at the Local Level, Chicago, IL, February 17-20.

- Case study documenting the experience of one rural Virginia community in incorporating LID into their local resource protection and regulatory programs.

Reports

Lehner, Peter, et al. 2001. "Chapter 12. Low Impact Development" in *Stormwater Strategies: Community Responses to Runoff Pollution*. New York, NY: Natural Resources Defense Council.

- Provides definition for LID and details seven benefits. Includes 11 case studies.

NAHB Research Center, Inc. 2003. *The Practice of Low Impact Development*. Washington D.C.: PATH and HUD Office of Policy Development and Research.

- Includes primer on LID, overview of LID tools and techniques, circulation and design guidelines. Appendix includes 6 case studies.

U.S. Environmental Protection Agency, Office of Water. 2007. *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*. EPA-841-F-07-006. Washington, DC: U.S. Environmental Protection Agency.

- Summarizes 17 case studies of developments using LID techniques and concludes that LID reduces project costs and improves environmental performance.

U.S. Environmental Protection Agency, Office of Water. 2000. *Low Impact Development: A Literature Review*. EPA-841-B-00-005. Washington, DC: U.S. Environmental Protection Agency.

- Early review of LID practices and effectiveness. Includes six detailed case studies.

Technical Manuals

Charlotte-Mecklenburg (North Carolina), City-County of. 2008. *Charlotte-Mecklenburg BMP Design Manual*. Revised. Chapter 2. Ordinances. Chapter 4. Structural Storm Water Controls.

- Provides examples of determining low and high density thresholds; detailed technical descriptions of 10 BMPs including summary fact sheets, design requirements, and design procedures.

Pierce (Washington), County of, Surface Water Management. 2009. *Pierce County Draft Stormwater Management and Site Development Manual*. Volume VI. Low Impact Development.

- Provides illustrated LID site design criteria and information on 13 BMPs.

Prince George's (Maryland), County of, Department of Environmental Resources. 1999. *Low-Impact Design Strategies: An Integrated Design Approach*.

- Classic LID guidebook exploring site planning, hydrologic analysis, integrated management practices, erosion and sediment control, and public outreach; includes sample maintenance contract.

San Diego (California), County of, Department of Planning and Land Use. 2007. *Low Impact Development Handbook: Stormwater Management Strategies*.

- Introduces LID, provides LID site planning principles and design examples for residential, commercial, and industrial development, and describes IMPs in hydrologic design and for permeable pavement, roads, parking lots, buildings, and landscaping.

Model Ordinances

Massachusetts Executive Office of Environmental Affairs. 2006. "Model Low Impact Development (LID) Bylaw" in *Massachusetts Smart Growth Toolkit*.

- Model LID bylaw and regulations; includes performance standards and provisions for inspection. Appendix covers LID credits and incentives

Vermont League of Cities and Towns. 2008. "Managing Stormwater through Low Impact Development (LID) Techniques." Municipal Assistance Center Technical Paper #5. Includes Model Low Impact Development Stormwater Management Bylaw.

- Model bylaw includes both pre-development and post-construction site standards.

Sample Ordinances

Fauquier (Virginia), County of. 2008. *A Zoning Ordinance Text Amendment to Sections 5-006.5, 12-610 and 15-300 Related to Utilization of Low Impact Development Techniques With Site Development*.

- Ordinance amends definition of LID, introduces LID standards into special permit and site plan drainage requirements.

Issaquah (Washington), City of. 2008. *Municipal Code*. Title 13, Public Services. Division I, Water. Chapter 13.28. Stormwater Management Policy. Section 13.28.055. Drainage Review – Deviations for Low Impact Development Proposals.

- Authorizes deviations from regular standards for LID proposals achieving low impervious surface development goals.

Lacey (Washington) City of. 1999. *Lacey Municipal Code*. Title 14: Buildings and Construction. Chapter 14.31, Zero Effect Drainage Discharge.

- Defines “zero effective impervious surface” and authorizes deviations from existing engineering and public works standards to achieve this goal.

Lower Makefield (Pennsylvania), Township of. 2007. *An Ordinance of the Township of Lower Makefield, Bucks County, Pennsylvania, Amending the Provisions of the Lower Makefield Township Code Related to Subdivision and Land Development to Provide for Low Impact Development Design Standards and Storm Water Management Practices*. Ordinance No. 363. *An Ordinance of the Township of Lower Makefield, Bucks County, Pennsylvania, Amending the Lower Makefield Township Codified Zoning Ordinance of 1996, as Amended, so as to Provide for Low Impact Development Standards*. Ordinance No. 364.

- Ordinances amend existing zoning code and subdivision regulations to include LID standards.

Port Angeles (Washington), City of. 2008. *Municipal Code*. Title 17. Zoning. Chapter 17.44. PLID – Planned Low Impact Development Overlay Zone.

- Planned Low Impact Development allows flexibility of site design to create high-quality residential development that conserves onsite natural features and uses small-scale engineered hydraulic controls to mimic predevelopment hydrologic conditions.

Sammamish (Washington), City of. 2008. *An Ordinance of the City of Sammamish, Washington, Amending the City of Sammamish Municipal Code to Create a Low Impact Development Chapter, and Amending Certain Other Chapters to Ensure Consistency with the Low Impact Development Chapter*. Ordinance No. O2008-236.

- Adds LID chapter to municipal code encouraging comprehensive incorporation of LID into project design. Use of BMPs earns Technique Points toward incentives including density and height bonuses.

Santa Monica (California) City of. 2000. *Municipal Code of Ordinances*. Article 7, Public Works. Chapter 7.10. Urban Runoff Pollution.

- Sets “good housekeeping requirements” and establishes Best Management Practices to maximize on-site absorption of stormwater and minimize pollution of urban runoff.

Snohomish (Washington), County of. 2009. *Unified Development Code*. Chapter 30.63C. Low Impact Development.

- Incorporates the LID Technical Guidance Manual for Puget Sound by reference, mandates LID use in certain locations. Authorizes modifications to bulk regulations, PRDs, and construction, drainage, grading, and access standards for LIP project proposals.

Stafford (Virginia), County of. 2008. *Stafford County Code*. Chapter 21.5, Article I. Stormwater Management.

- Incorporates LID manuals by reference. Provides special requirements for low impact development site stormwater management design plans.

Additional Online Resources

Green Roofs for Healthy Cities. <http://www.greenroofs.org/>

Low Impact Development Center, Inc.
<http://www.lowimpactdevelopment.org/home.htm>

Metropolitan Area Planning Commission- Massachusetts Low Impact Development Toolkit. <http://www.mapc.org/LID.html>

National LID Clearinghouse. <http://www.lid-stormwater.net/clearinghouse/>

Puget Sound Online Low Impact Development Resources.
<http://www.psp.wa.gov/stormwater.php>

Seattle, Washington Street Edge Alternatives (SEA Streets) project.
http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

U.S. EPA's Low Impact Development Website. <http://www.epa.gov/nps/lid/>

U.S. EPA's National Pollutant Discharge Elimination System Stormwater Program.
http://cfpub.epa.gov/npdes/home.cfm?program_id=6

University of New Hampshire Stormwater Center – Nonpoint Education for Municipal Officials (NEMO) Innovative Stormwater Management Inventory.
<http://www.erg.unh.edu/stormwater/index.asp>