

New Hampshire Office of Energy & Planning 2013 Conference

Low Impact Development: Online Learning – Education and Local Adoption



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May 11, 2013



LID Stormwater Practices

Table 1. Summary of LID Practices Employed in the Case Studies

Name	LID Techniques							
	Bioretention	Cluster Building	Reduced Impervious Area	Swales	Permeable Pavement	Vegetated Landscaping	Wetlands	Green Roofs
Garden Valley	✓	✓		✓	✓		✓	
Kensington Estates		✓	✓		✓	✓	✓	
Laurel Springs	✓	✓	✓	✓				
Mill Creek		✓	✓	✓				
Poplar Street Apartments	✓			✓			✓	
Portland Downspout Disconnection*			✓					
Prairie Crossing	✓		✓	✓		✓		
Prairie Glen	✓	✓	✓	✓		✓	✓	

Source: EPA (2007) Reducing Stormwater Costs Through Low Impact Development (LID) Strategies and Practices (EPA-841-F-07-006)



**Conventional
Subdivision**

Not so good.

**Open Space
Subdivision**



Good.

LID: Status of NH Adoption

- LID is an effective and efficient approach to stormwater
- LID may help mitigate extreme climate events and be more aesthetic (design)
- Introduction of bio-retention technology in Prince George's County, Maryland, in the mid-1980s

Who has adopted LID regulations?

Science-based, training and LID Performance Data

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“Our research data tell us that it’s possible to design and install systems that do an excellent job of treating pollutants in stormwater, dampening the peak flows of runoff, and reducing the volume of stormwater through infiltration, even in cold climates with poor soils.”

– UNH Stormwater Center 2007 Annual Report

1. Impact Development Conference Proceedings, 2011 Low Impact Development Symposium, March 2012

2. Water Quality and Hydrologic Performance of a Porous Asphalt Pavement as a Stormwater Treatment Strategy in a Cold Climate, Journal of Environmental Engineering, January 2012

STORMWATER CENTER resources through effective stormwater management.

A Comparison of Maintenance Cost, Labor Demands, and System Performance for LID and Conventional Stormwater Management, ASCE Journal of Environmental Engineering, Published: 29 January 2013
[More Information »](#)

We welcome and invite municipalities and

What's the Hold Up?

(canvass from some partners)...

1. Lack of education on what LID is.
2. LID is not viewed as a viable option due to cost, maintenance.
3. There isn't enough specific language or guidance on the adoption of LID regulations.
4. Lack of support or regulatory insistence from state or federal governments.
5. Engineers are not adopting it quickly.
6. Disinterest in new regulations.



Education

- NH Citizen Planner training modules on “Forging the Link”
- Discusses economic issues and potential of LID to mitigate climate impacts

ROLL THE FILM



Making LID Happen



Explore Non-Regulatory Opportunities to Work with Landowners



Cardinal Street Before



Cardinal Street After



Cardinal Street Before



Cardinal Street After

York LID Ordinance: Simple

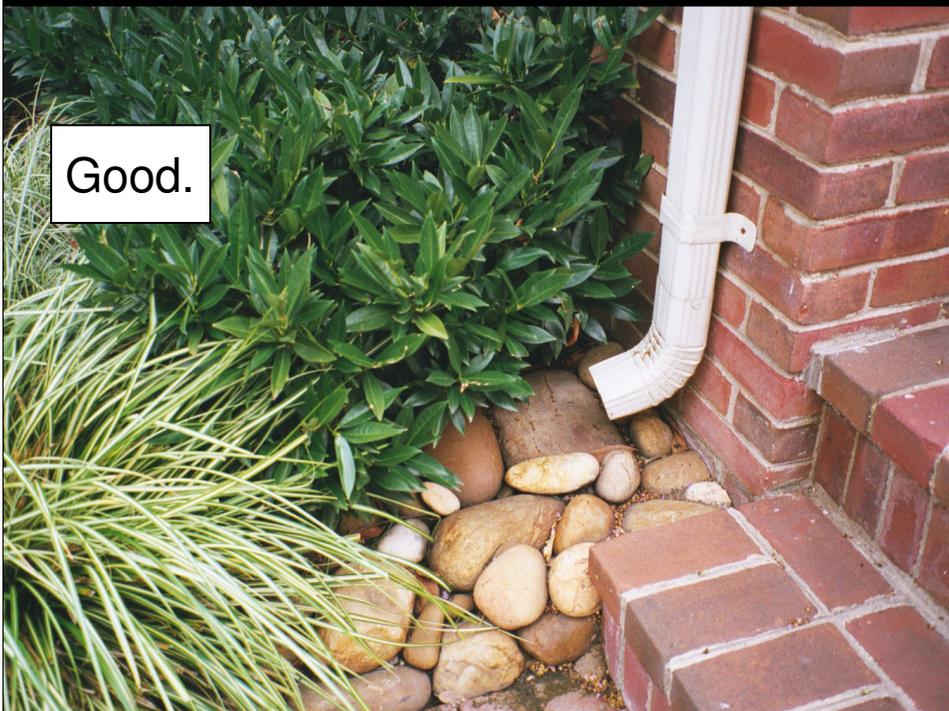
- Low Impact Design. *“Each applicant is required to submit a statement to the Planning Board documenting proposed Low Impact Design (LID) for the site, which will help to reduce stormwater volumes and help to enhance stormwater quality.”*
- *“LID includes, but is not limited to green roofs, rain gardens, tree wells, infiltration basins, and permeable pavement. The applicant shall submit technical documentation about the suitability of such designs with the request for LID features.”*

Simple...but doesn't by itself control design

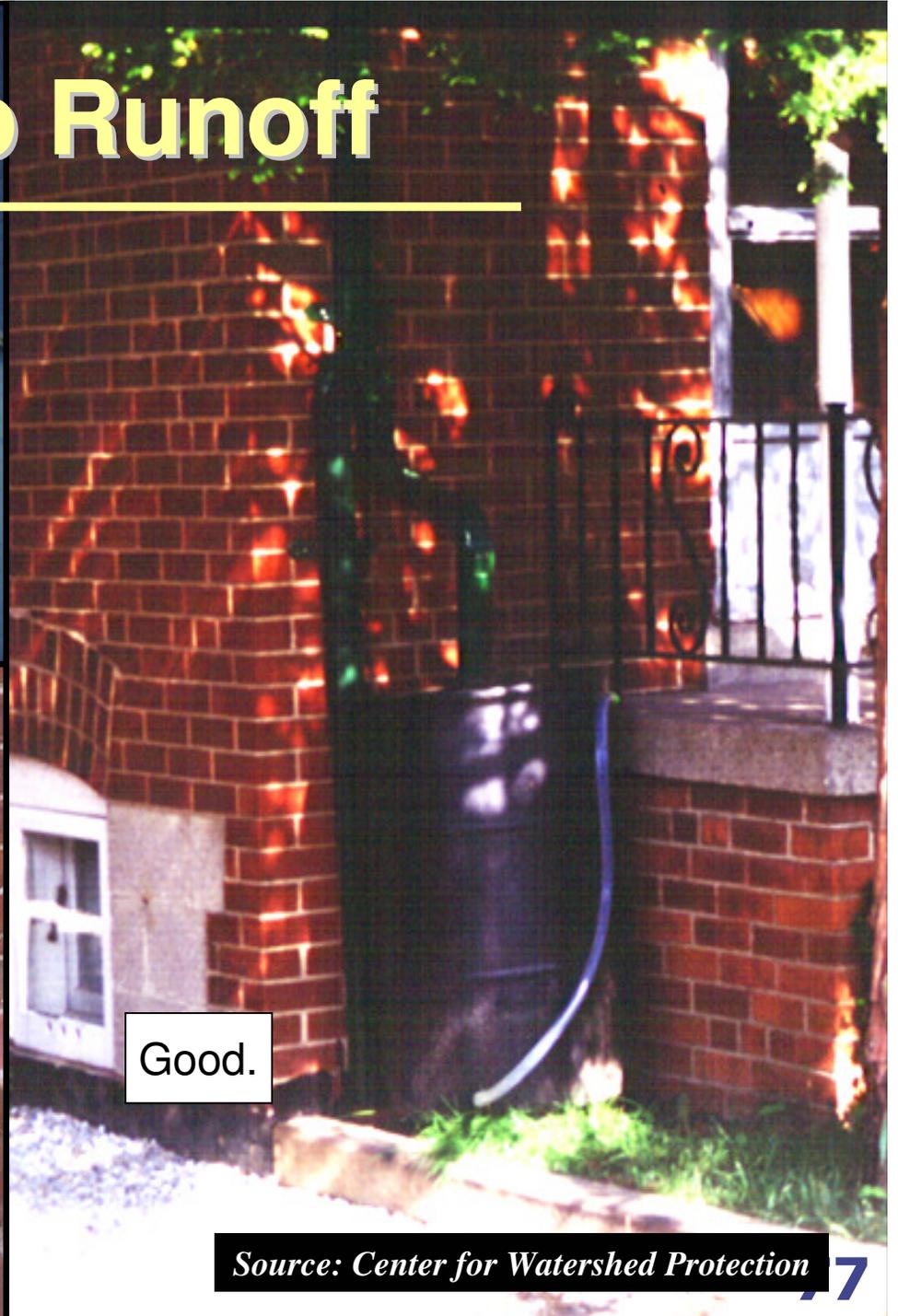
Rooftop Runoff



Not so good.



Good.



Good.

Source: Center for Watershed Protection

Street Width

Not so good.

Many municipalities continue to have local codes or regulations in place that discourage or even prohibit impervious cover reductions

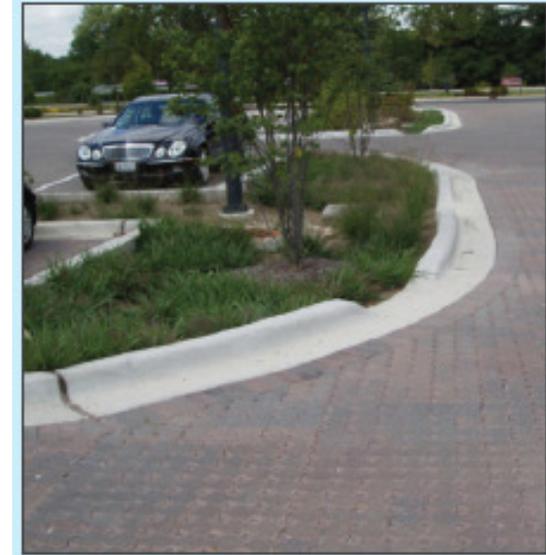
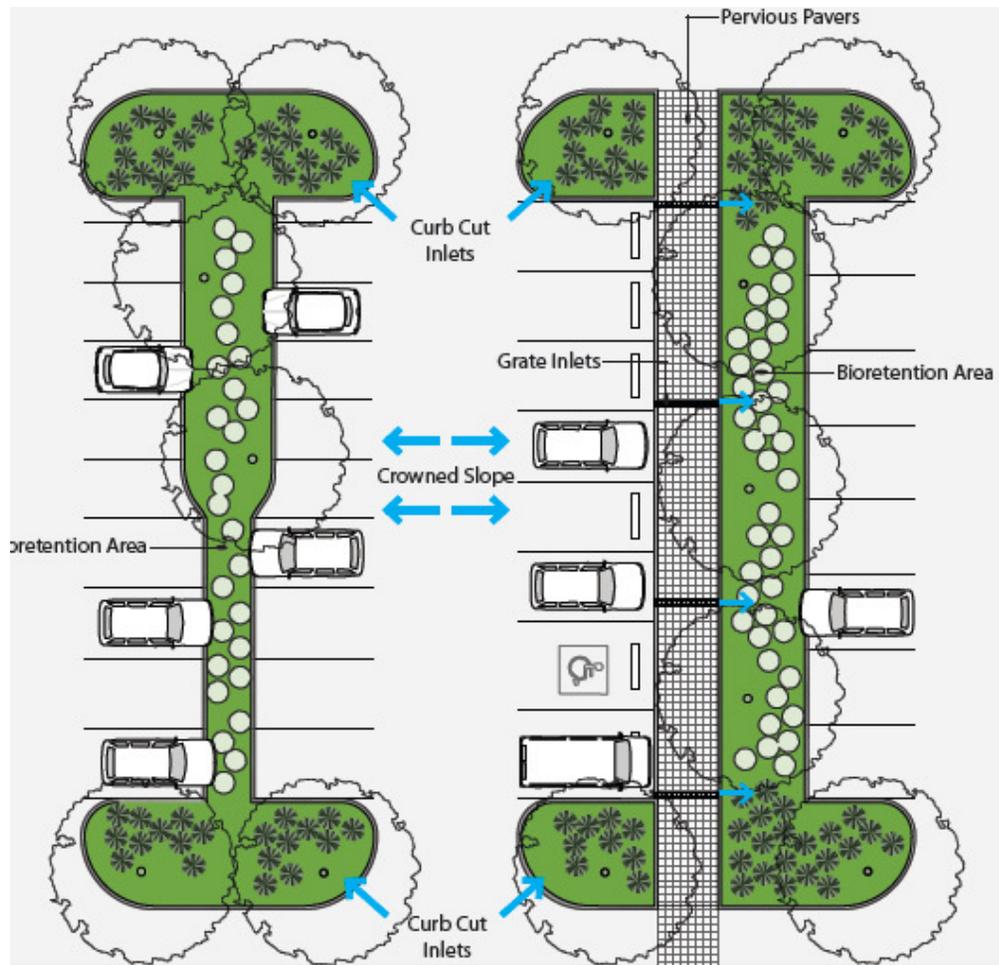
Residential streets should be designed to be as narrow as possible based on future traffic volumes without compromising safety.

Good.

Parking:



Parking & LID



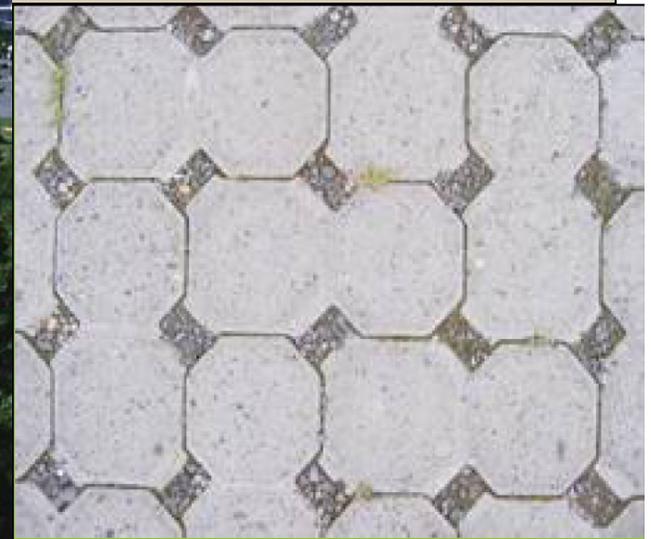
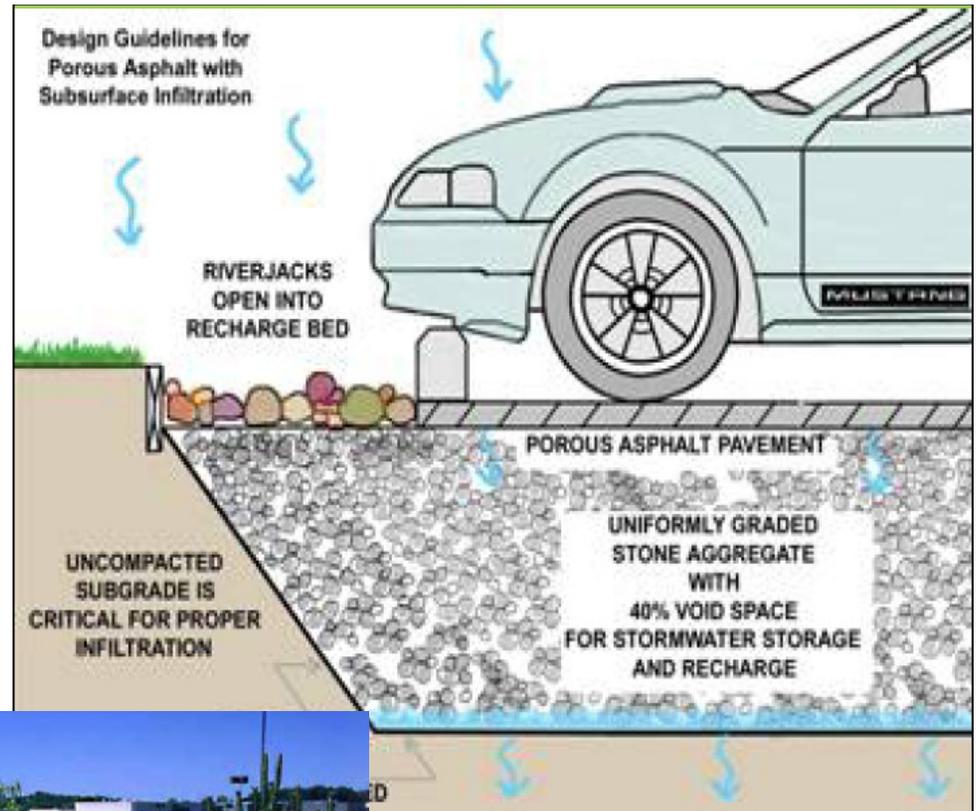
Source: Illinois Environmental Protection

A curb cut inlet directs stormwater runoff into a biofiltration planter.

- Minimize impervious surfaces and use site grading to direct runoff to landscaped areas where LID strategies can be utilized
- Break up and direct flows to multiple LID features.

Permeable Paving Runoff Reduction

- Grass pavers
- Paving stones
- Porous asphalt
- Pervious concrete
- Reinforced turf



Infiltration: Not!



Somersworth, NH Site Plan Regs

LID Residential Design Element: Shared Driveways Reduce Impervious Area



Somersworth Site Plan Regulation: Getting Support Over Time

- The City of Somersworth encouraged LID for many years with several successful projects.
- Before even drafting regulations, the City staff visited UNH/SC
- Discussed voluntary adoption of LID with developers
- LID regulations proposed in 2011 passed City Council unanimously

New LID Commercial Development in Somersworth



Source: David Sharples, Somersworth Planning Director

Somersworth, NH LID Site Plan Regulations

- Requires groundwater recharge
- Requires the best available treatment with the least impact
- Requires careful analysis of the onsite conditions
- Requires practices that maintain/improve water quality
- Requires an Operation and Maintenance Plan with an annual reporting requirement

Source: David Sharples, Somersworth Planning Director

Acton, ME

Stormwater Mgt Ordinance (proposed)

- *“Impervious cover should be disconnected from the stormwater drainage network, through such techniques as infiltration, sheet flow over a pervious area, or other approved LID techniques.”*



LID in your local codes?

- Subdivision regulations
 - disconnection and retention of mature natural landscape
- Site plan regulations
 - Parking, curbing and road design
- Stormwater ordinance
 - LID practices



Photo: Horsley-Whitten, Inc.

RSA 674:16, Grant of Power,
RSA 674:17, Purposes of Zoning
Ordinance, and RSA 674:21,
Innovative Land Use Controls.

LID Resources for Ordinances

- NH DES Innovative Land Use Guide – Post Construction Stormwater Ord Template – <http://des.nh.gov>
- MA Smarthgrowth Toolkit – <http://mass.gov>
- Model Stormwater Standards for Coastal Watershed Communities <http://southeastwatershedalliance.org>
- City of Somersworth – Site Plan Regulations
- Town of York, ME – LID Ordinance
- Town of Acton, ME – Stormwater Ordinance