GI/LID Implementation in CT: Status & Forecast

NOAA Green Infrastructure Workshop
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David Dickson
University of Connecticut
Dept. of Extension
Center for Land Use Education & Research
david.dickson@uconn.edu
Today’s Agenda:

- State of LID
  - regulations/policies
  - obstacles/barriers
- LID Forecast
Center for Land Use Education and Research at the University of Connecticut

- Approved by UConn Board of Trustees in 2002
- Dept. of Extension / Dept. of NRE / CT Sea Grant
- 8–9 core faculty/staff
- largely grant funded
- Mission: ...
  to provide information and assistance to land use decision makers and other audiences in support of better land use decisions, healthier natural resources, and more resilient communities.
CLEAR Program Areas

- Water
- Land Use & Climate Resiliency
- Geospatial Tools & Training
- STEM Education & Local Conservation

- Applied research
- Geospatial technology
- Extension outreach
CLEAR Program Areas

- **Water**
- **Land Use & Climate Resiliency**
- **Geospatial Tools & Training**
- **Secondary School STEM**

- **NEMO Program**: MS4 support
- Rain garden training & smartphone app
- LID on campus
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The State of Low Impact Development in Connecticut

A story map by Manon Leffre, David Dickson, Chet Arnold, and Kerri Kimmear

This story map presents the findings of a review of 95 Connecticut municipalities’ low impact development policies, included in Plans of Conservation and Development, Zoning and Subdivision regulations, and stormwater and LID-design manuals. Our goal is not only to show a snapshot of LID throughout the state, but to provide a resource for municipalities hoping to incorporate more low impact development.

Low impact development (LID), also increasingly referred to as green infrastructure or green stormwater infrastructure, is designed to reduce the negative impacts of traditional development on our water resources. The goal of LID is to preserve the predevelopment hydrology of a site, move away from conventional underground drainage systems, preserve natural landscape features, and minimize imperviousness to create functional and appealing site drainage that treats stormwater as a resource.

Low impact development can lower flood risk, replenish groundwater reserves, reduce urban heat island effect, lower building energy demands, protect water resources, limit erosion, and reduce stress on municipal sewer systems. There are many site-level practices used in LID, including green roofs, rain gardens, and permeable pavements. LID can be applied to new development, redevelopment, or as retrofits to existing development, in both highly urban and rural settings.

The Connecticut Nonpoint Education for Municipal Officials (NEMO) program created a Low Impact Development Atlas to highlight innovative LID practices at the local and national levels. Here, you can find specific examples of LID projects near you, and contribute your own.

Project Phase I: LID Review

Using a framework of 14 LID planning and development policies found in CLEAR's LID Policy and Design Manual for Connecticut, we assessed the Plans of Conservation and Development, Zoning and Subdivision regulations, and Stormwater and Runoff in 95 municipalities in Connecticut. The results are as follows: 30 municipalities include a policy that aligns with LID principles, and 51 of the municipalities have some guidelines that may contribute to LID development planning. In addition, 146 policies found in the NEMO documents, we looked to see if the goals of LID are received and helping improve water quality in their plans or regulations.

Click here to see a list of municipalities and if they have a policy in place, as well as the criteria that are in place for LID planning.

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Analysis

What LID policies are most common in CT?

LID policies are more common in the state than in other regions in the northeastern US. Find out which states are more active.

http://s.uconn.edu/stateoflid
Why Bother?

Schlepping to town hall since 1991
Why Bother?

*LID examples/awareness growing*
Why Bother?

- Remove LID barriers in regs.
- Require LID as 1st option
- Reduce DCIA by 1% per year with retrofits

New MS4 general permit
Today’s Agenda:

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Step 1: Regulation Review

<table>
<thead>
<tr>
<th>LID Practice</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>1. Street Width</td>
<td>Design residential streets for the minimum required pavement width needed to support travel lanes, on-street parking, emergency services and maintenance access. (20 out of 65 towns)</td>
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<tr>
<td>2. Cul-De-Sacs</td>
<td>Minimize the number of residential cul-de-sacs and, where they do exist, incorporate landscaped areas to reduce impervious cover and encourage infiltration of stormwater runoff. (31 out of 65 towns)</td>
</tr>
<tr>
<td>3. Road Drainage</td>
<td>Where density, topography, soil and slopes permit, vegetated swales should be used in the street right-of-way to convey and treat stormwater runoff, replacing curb and gutter drainage systems (34 out of 65 towns)</td>
</tr>
<tr>
<td>4. Parking Blue</td>
<td>Required parking ratios governing a particular land use or activity should be enforced as both a maximum and a minimum in order to curb excess parking construction. Further, reduce the overall imperviousness associated with parking lots by minimizing stall dimensions and incorporating efficient parking lanes. (44 out of 65 towns)</td>
</tr>
<tr>
<td>5. Parking Runoff</td>
<td>Whenever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips and/or other practices that can be integrated into required landscaping areas and traffic islands. (42 out of 65 towns)</td>
</tr>
<tr>
<td>6. Conservation/Open Space Subdivision</td>
<td>Encourage development designs that minimize total impervious area, reduce total construction costs, conserve natural areas, and provide community recreational space and promote watershed protection. (70 out of 65 towns)</td>
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<td>7. Setbacks and Frontages</td>
<td>Relax side yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front yard setbacks requirements to minimize driveway lengths and reduce lot imperviousness. (20 out of 65 towns)</td>
</tr>
<tr>
<td>8. Sidewalks</td>
<td>Promote more flexible design standards for residential sidewalks on only one side of the street and provide common walkways linking pedestrian areas, use permeable pavement. (44 out of 65 towns)</td>
</tr>
<tr>
<td>9. Driveways</td>
<td>Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together. (28 out of 65 towns)</td>
</tr>
<tr>
<td>10. Roof Runoff</td>
<td>Direct roof runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system. (20 out of 65 towns)</td>
</tr>
<tr>
<td>11. Stormwater Management Plan</td>
<td>As a minimum, a stormwater management plan should be required for sites that have detention equal to or greater than one acre, as proposed by the CT Stormwater Quality Manual. The purpose of the plan is to identify potential water quality and quantity impacts of the proposed development, and to propose selected source controls and treatment practices to mitigate against those impacts. (55 out of 65 towns)</td>
</tr>
<tr>
<td>12. Riparian Buffers</td>
<td>Riparian Buffers: Create a naturally vegetated buffer along all water resources that also encompass critical environmental features such as the 100-year floodplain, steep slopes, and wetlands, which should be preserved or restored with native vegetation. (40 out of 65 towns)</td>
</tr>
<tr>
<td>13. Clearing and Grading</td>
<td>Clearing and grading of forests and native vegetation on a site should be limited to the minimum amount needed to build lots, allow access, and provide fire protection. (43 out of 65 towns)</td>
</tr>
<tr>
<td>14. Tree Conservation</td>
<td>Conserve trees and other vegetation at each development by protecting trees and other vegetation during construction and by planting additional vegetation, disturbiing tree areas, minimizing native vegetation disturbance, and promoting the use of native plants. (77 out of 65 towns)</td>
</tr>
</tbody>
</table>
Selecting Towns

- not randomized
- towns we knew
- urban/suburban/rural
- median home price
- geographic distribution
- 9 “regions”
Interns are wonderful

Scoured town websites for:

- POCDs
- Zoning regulations
- Subdivision regulations
- Inland/wetlands regulations
- Stormwater plans/other
General Support for LID

54 of 85 towns mention LID in regs
General Support for LID

65 of 85 towns mention reducing impervious surfaces
Specific Regulations

LID Practices by Number of Towns Adopted

Breakdown of LID Policies

Number of Towns Containing Policy

LID Policy

Conservation/Open Space/Subdivision
Tree Conservation
Riparian Buffers
Stormwater Management Plan
Parking Sizing
Sidewalks
Cul-de-Sacs
Setbacks and Frontages
Roof Runoff
Driveways
Street Width
Road Drainage
Pavement Runoff
Clearing and Grading
Parking Runoff
Driveways
Street Width
Cul-de-Sacs
Setbacks and Frontages
Roof Runoff

landscape scale
site scale
Does size matter?

<table>
<thead>
<tr>
<th>Number of LID Policies by Population</th>
<th>1-4 Policies</th>
<th>5-8 Policies</th>
<th>9-12 Policies</th>
<th>13-16 Policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>78,001 - 140,000</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>35,001 - 78,000</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>14,001 - 35,000</td>
<td>2</td>
<td>14</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>0-14,000</td>
<td>7</td>
<td>12</td>
<td>17</td>
<td>5</td>
</tr>
</tbody>
</table>
Does wealth matter?
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  • obstacles/drivers

• LID Forecast
1. Does your community encourage/require the use of low impact development or green infrastructure to manage stormwater? If so, in what ways?

2. What are the factors driving your community to encourage or not encourage LID?

3. What are the biggest obstacles to implementing LID regulations or practices in your town?
An aside about Terminology

LID vs green infrastructure

- Often used interchangeably
- Federal & state agencies using green infrastructure
- LID used at local level – so we used LID
Who’d we talk to?

Interviewed 78 people in 74 of 85 towns reviewed.
Who’d we talk to?

78 interviews over 2 months
Top 5 LID Drivers

- Staff Champions: 37
- Environmental Motives: 31
- Commission Champions: 29
- Stormwater Concerns: 18
- Community Character: 17
All LID Drivers

Number of Town Responses

- Staff Champions: 37
- Commission Champions: 29
- Environmental Motives: 31
- Stormwater Concerns: 18
- Community Culture: 17
- Private Sector: 13
- Education/Outside Organizations: 13
- Reduced Cost: 9
- Other: 12
Top 5 LID Barriers

- Cost: 28
- Lack of Educational Opportunities: 27
- Maintenance Concerns: 18
- Town Staff: 16
- Lack of Resources: 14
LID Barriers

Cost: to developers/applicants, to town, to residents

Lack of ed: commissioners, community/homeowners, contractors, developers, nurseries, private engineers, town engineers, planners, staff

Maintenance: difficult to keep track of LID, maintenance concerns
**Town staff**: lack of coordination between planning and public works, planner, public safety (fire department, etc.), public works, town engineer

**Lack of resources**: lack of funding/resources, no in-house engineer, time constrains (Staff/Volunteers)
All LID Barriers

Number of Town Responses

Perceived Higher Cost > Maintenance Concerns >> Other >> Lack of Resources >> Site Constraints >> Poorly Written Regulations >> Low-Priority Issue >> Developer Pushback >> Public Pushback >> Engineering Community
What it all means

• Education is still key – finding champions & removing obstacles
• Many barriers are an education issue
• Maintenance challenge – who is responsible?
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From carrots to sticks
Removing LID barriers

Towns must:

“identify and, where appropriate, reduce or eliminate existing local regulatory barriers to implementing LID and runoff reduction practices”
LID - 1st option

Towns must require that:

“a developer or contractor seeking the permittee’s approval shall consider the use of low impact development ("LID") and runoff reduction site planning and development practices prior to the consideration of other practices”
Towns must:

- reduce **directly connected impervious area (DCIA)** by 2% by 2022
- develop a plan for meeting 2% goal
- track reductions & additions
- 5 year look back to 2012
Retention Standard

On sites greater than 1/2 acre towns must require:

New development
• retain 1” on site

Redevelopment
• DCIA less than 40% - 1” on site
• DCIA greater than 40% - ½” on site
So . . .
So . . .
So . . .
NEMO MS4 Support

- circuit rider
- website
- workshops & webinars
- regulation/policy templates
http://s.uconn.edu/stateoflid
http://lidmap.uconn.edu
Thanks

David Dickson
david.dickson@uconn.edu
http://clear.uconn.edu