UCONN | COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

Research Brief

February 2016

The State of Low Impact Development in Connecticut

Policies, Drivers and Barriers

Delaware Valley Regional Planning Commission

March 1, 2016

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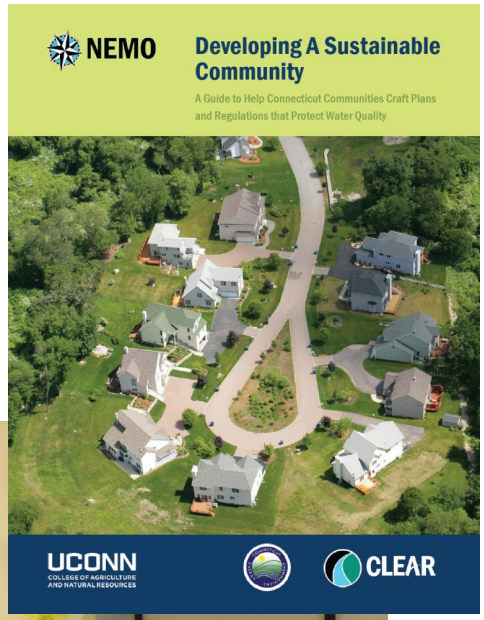
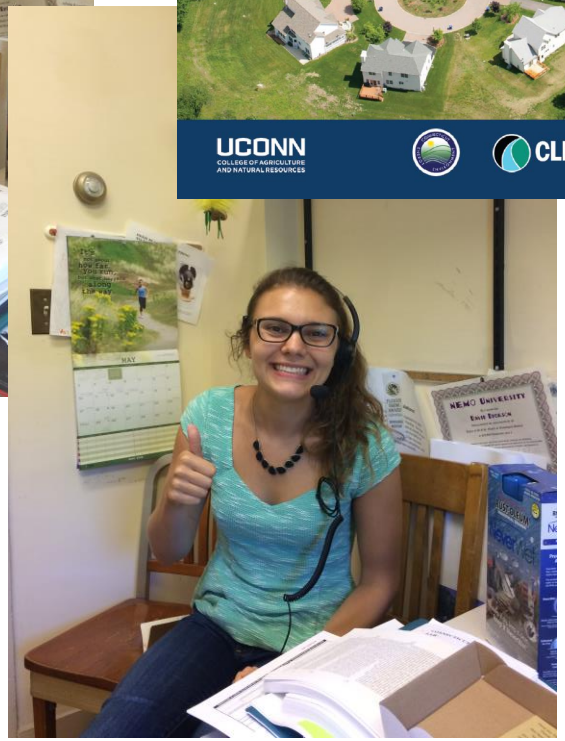
CLEAR

Interns are wonderful





Scoured town websites for:

- POCDs
- Zoning regulations
- Subdivision regulations
- Inland/wetlands regulations
- Stormwater plans/other

Today's Agenda:

- **CLEAR & NEMO background**
- **State of LID review in 2 phases**
- **Results**

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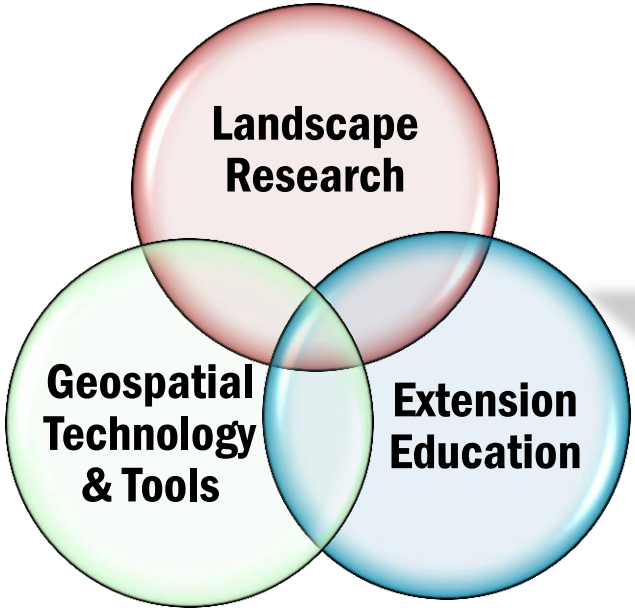
Center for Land Use Education and Research (CLEAR)

- Water
- Land use & climate adaptation
- Geospatial (mapping) technology



http://clear.uconn.edu

CLEAR

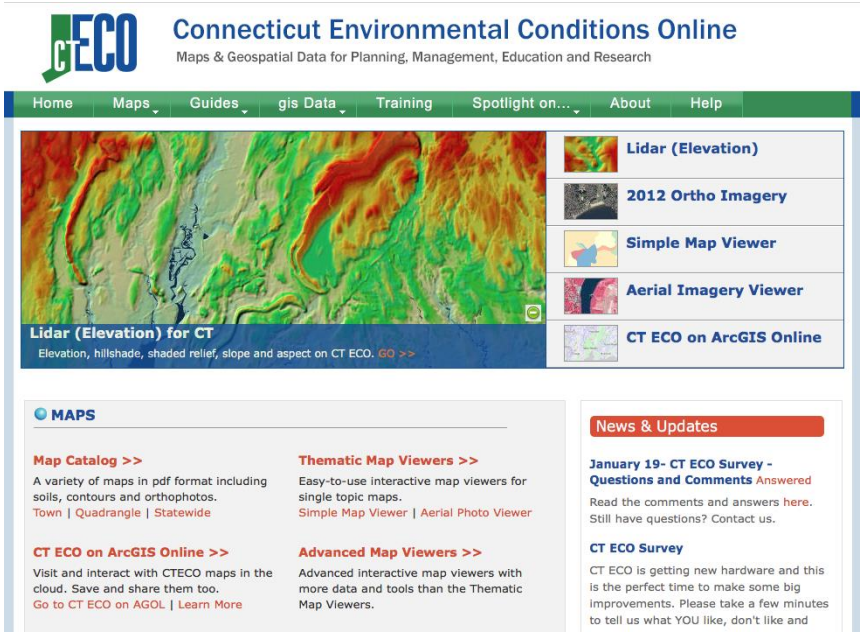
CLEAR Programs

Land Use Academy

- Basic & Advanced Training for Commissioners
- Climate Adaptation Academy

CLEAR

CLEAR Programs



Geospatial Training Program

- Training: GIS, GPS, Online Mapping, Smartphone GPS
- Tools/Research: CTECO, CT's Changing Landscape

CLEAR

CLEAR Programs

NEMO

- Linking Land Use to Water Quality
- LID/Green Infrastructure
- Tools: RG App, LID Atlas, etc.

CLEAR

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State of LID Research

A story map

CLEAR

The State of Low Impact Development in Connecticut

A story map by Manon Lefèvre, David Dickson, Chet Arnold, and Kerrin Kinnear

This story map presents the findings of a review of 85 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, perserve 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 **bioretention**, **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 Municial 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 UConn CLEAR and NEMO's 2009 document, Developing a Sustainable Community, we reviewed the Plans of Conservation and Development, Zoning and Subdivision regulations, and Stormwater and LID guides of 85 Connecticut towns, shown **right**. This list was not randomly chosen, but began with towns that were known to CLEAR and NEMO, and expanded to ensure that the overall pool represented all nine regional Councils of Governments (COGs) in the state, as well as a wide range of population and economic demographics. Statistics generated by this review should not be extrapolated to the entire state. Still, with more than half of Connecticut's 160 municipalities represented, the results are robust and informative.

In addition to the 14 policies found in the NEMO document, we looked to see if the goals of **LID in general** and **reducing impervious surfaces in particular** were mentioned in their plans or regs.

54 out of 85 towns mentioned LID in their plans or regulations.
65 out of 85 towns mentioned reducing impervious surfaces.
Towns shown in light gray are those that were reviewed but did not contain those policies.

Click **here** to see a breakdown of number of LID policies for each Connecticut municipality reviewed. Click on a town to see its name and number of policies found.

If you would like to contribute information on LID in your town, you can fill out our Google form **here**.

Click **here** to get back to the map of CT municipalities surveyed.

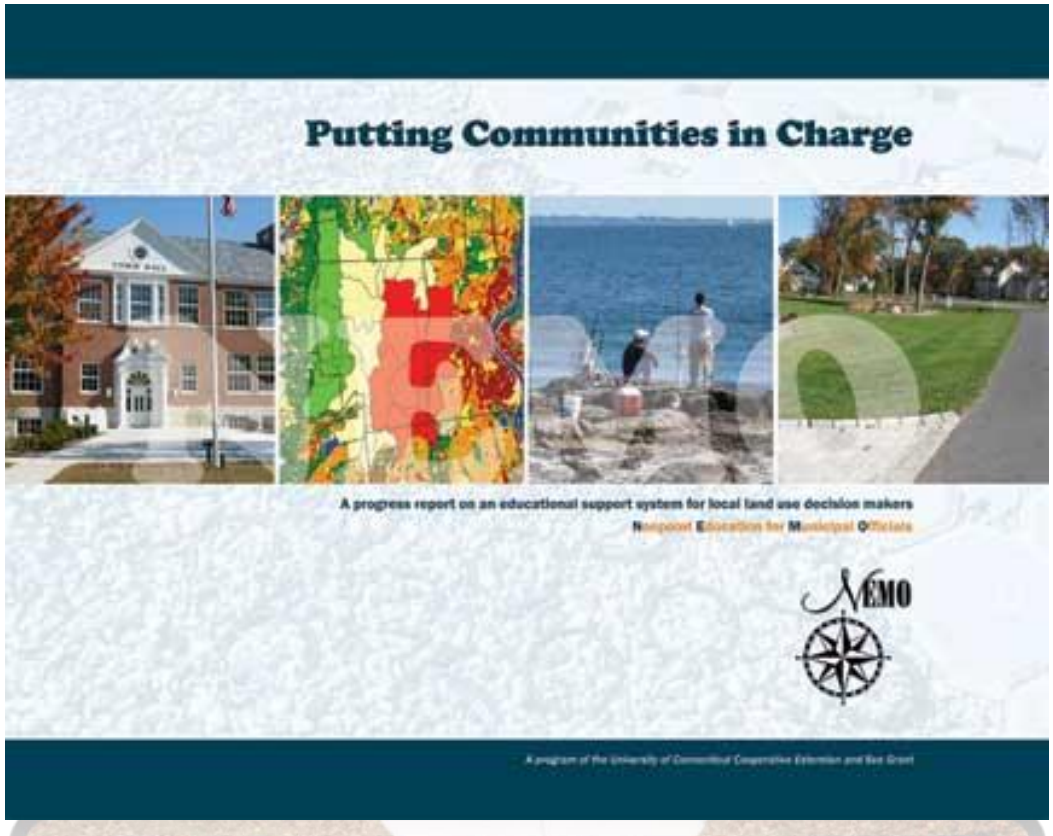
Analysis

What LID policies are most common in CT?

Some LID policies are more prevalent in the state than others as indicated by the percentages below. **Find out which towns are using which**

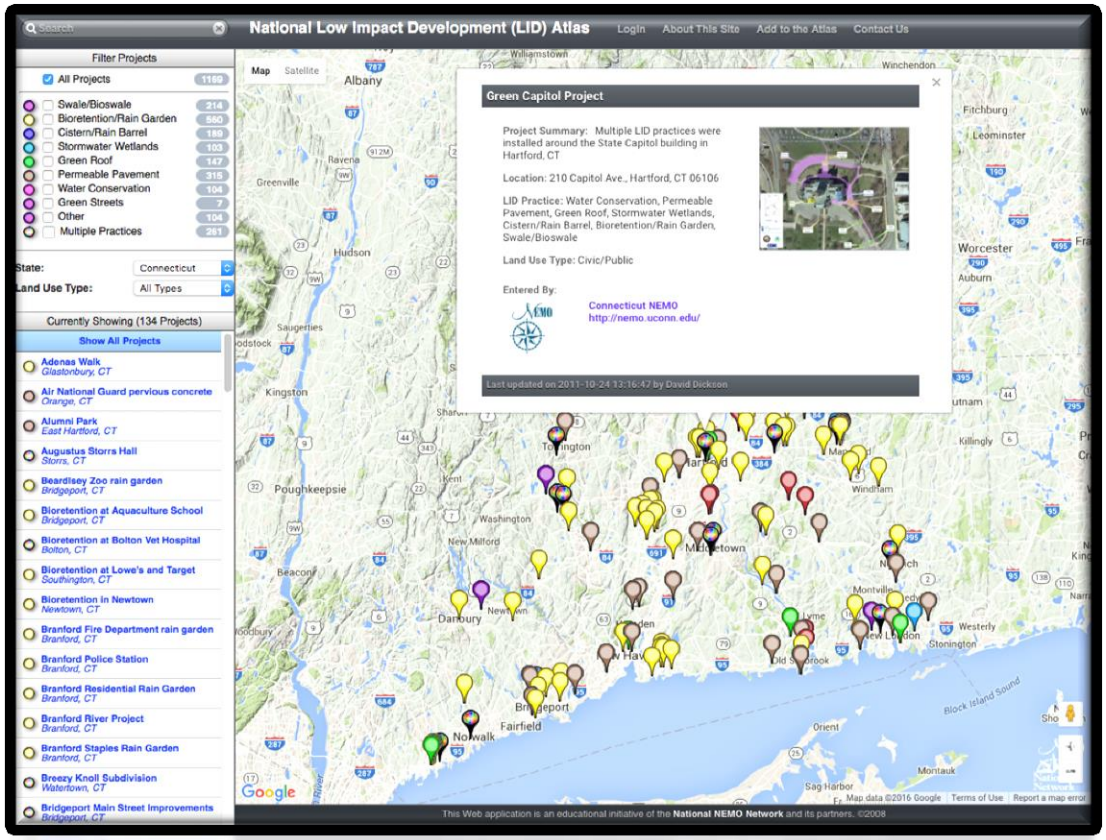
http://s.uconn.edu/stateoflid

Why Bother?



Schlepping to town hall since 1991

Why Bother?

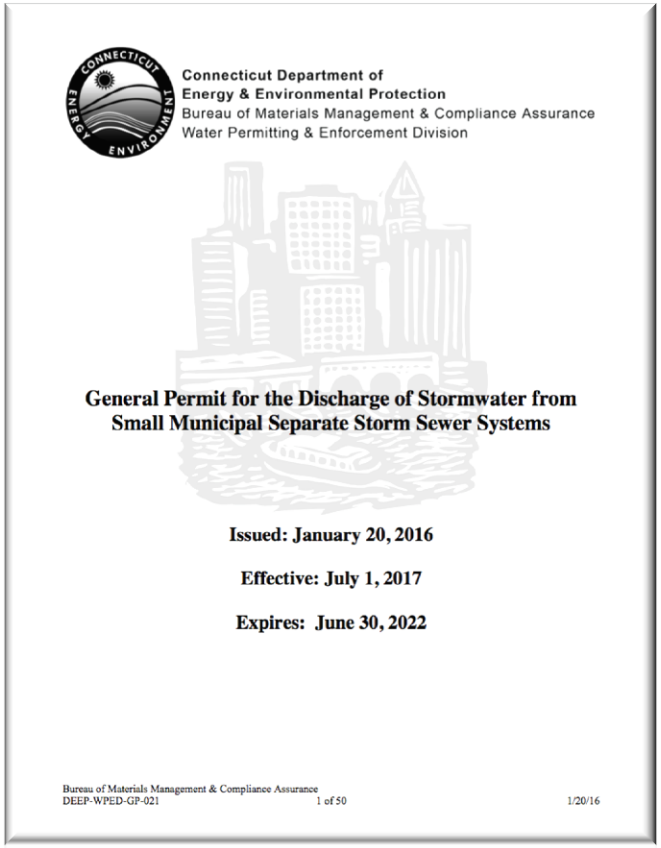


LID examples/awareness growing

Why Bother?

Strategy

Why Bother?



Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Issued: January 20, 2016

Effective: July 1, 2017

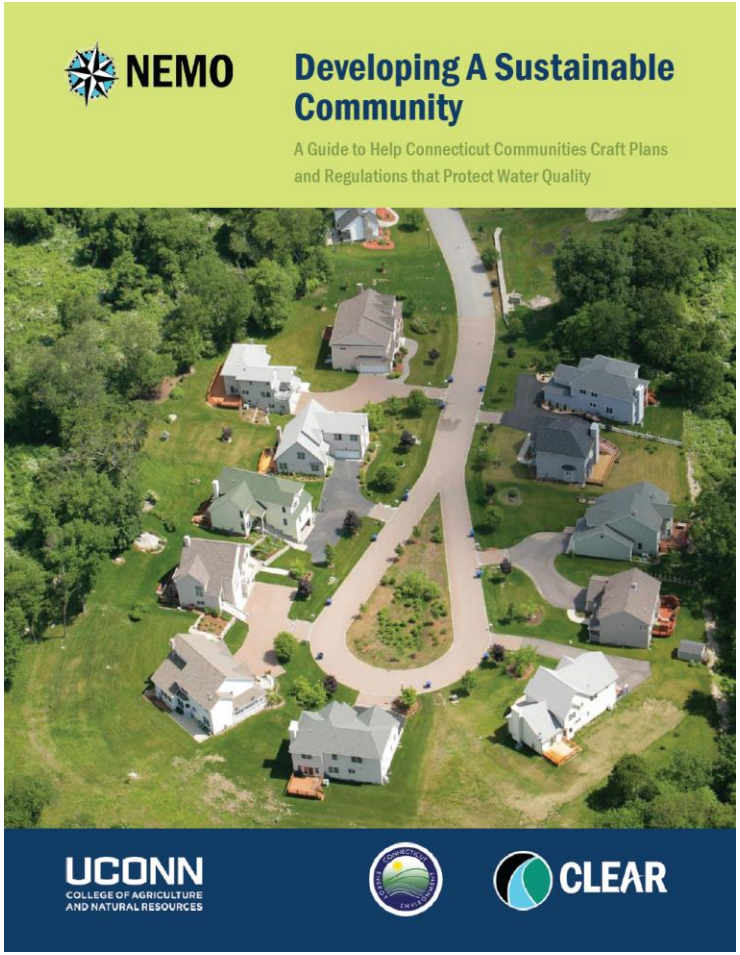
Expires: June 30, 2022

Bureau of Materials Management & Compliance Assurance
DEEP-WPED-GP-021 1 of 50 1/20/16

- Include LID in Regs
- Address stormwater maintenance
- Reduce DCIA by 1% per year

New MS4 general permit

Step 1: Regulation Review



LID Practice	
1. Street Width	Design residential streets for the minimum required pavement width needed to support travel lanes, on-street parking, emergency services and maintenance access. (25 out of 85 towns)
2. Cul-De-Sacs	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. (21 out of 85 towns)
3. Road Drainage	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 85 towns)
4. Parking Size	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 85 towns)
5. Parking Runoff	Wherever 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. (41 out of 85 towns)
6. Conservation/Open Space Subdivision	Encourage development designs that minimize total impervious area, reduce total construction costs, conserve natural areas, and provide community recreational space and promote watershed protection. (76 out of 85 towns)
7. Setbacks and Frontages	Relax side yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front yard setback requirements to minimize driveway lengths and reduce lot imperviousness. (20 out of 85 towns)
8. Sidewalks	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 85 towns)
9. Driveways	Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together. (28 out of 85 towns)
10. Roof Runoff	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 85 towns)
11. Stormwater Management Plan	As a minimum, a stormwater management plan should be required for sites that have disturbance 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. (65 out of 85 towns)
12. Riparian Buffers	Riparian Buffers: Create a naturally vegetated buffer along all water resources that also encompasses critical environmental features such as the 100-year floodplain, steep slopes, and wetlands, which should be preserved or restored with native vegetation. (59 out of 85 towns)
13. Clearing and Grading	Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access, and provide fire protection. (43 out of 85 towns)
14. Tree Conservation	Conserve trees and other vegetation at each development by protecting trees and other vegetation during construction and by planting additional vegetation, clustering tree areas, minimizing native vegetation disturbance, and promoting the use of native plants. (71 out of 85 towns)

Step 2: Phone Interviews

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?

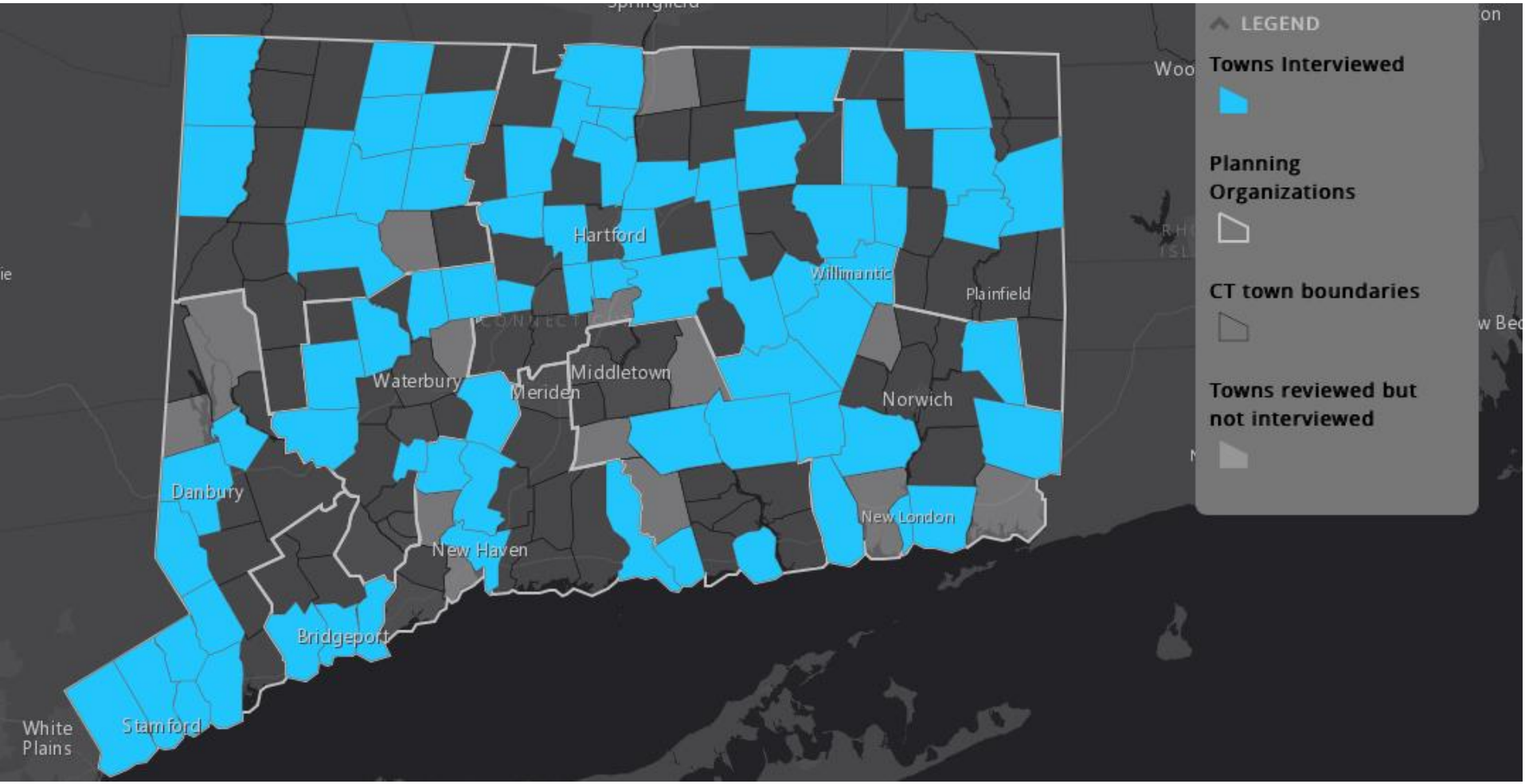
3. What are the **biggest obstacles** to implementing LID regulations or practices in your town?

An aside about Terminology

LID vs green infrastructure

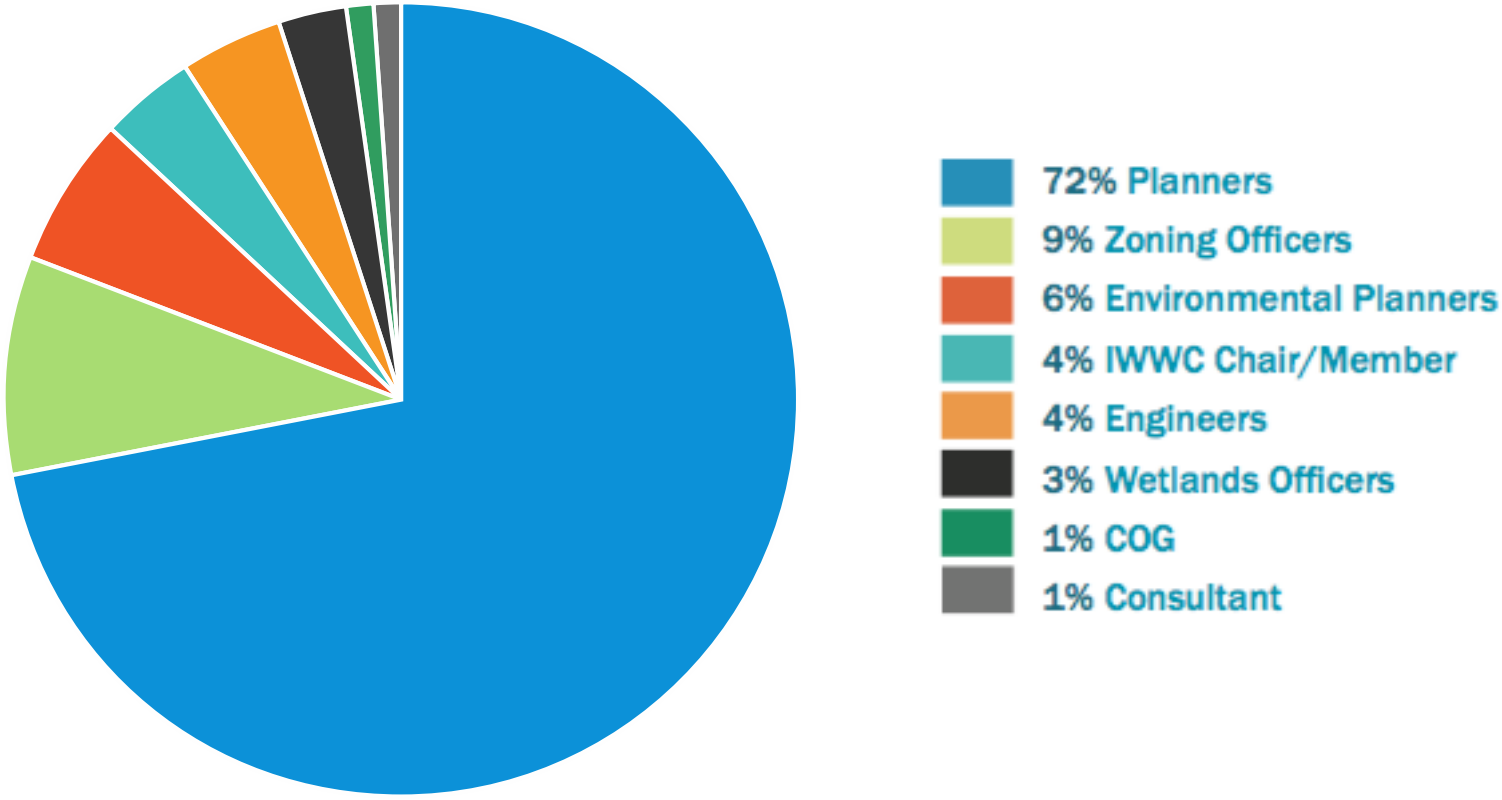
- Often used interchangeably
- Federal & state agencies using green infrastructure
- LID used at local level – so we used LID

Who'd we talk to?



Interviewed 78 people in 74 of 85 towns reviewed

Who'd we talk to?



78 interviews over 2 months

Today's Agenda:

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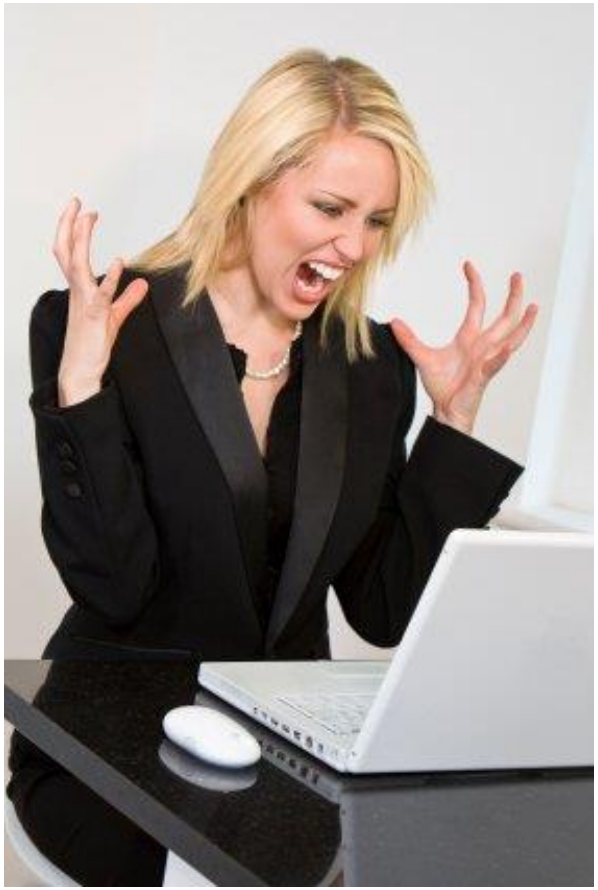
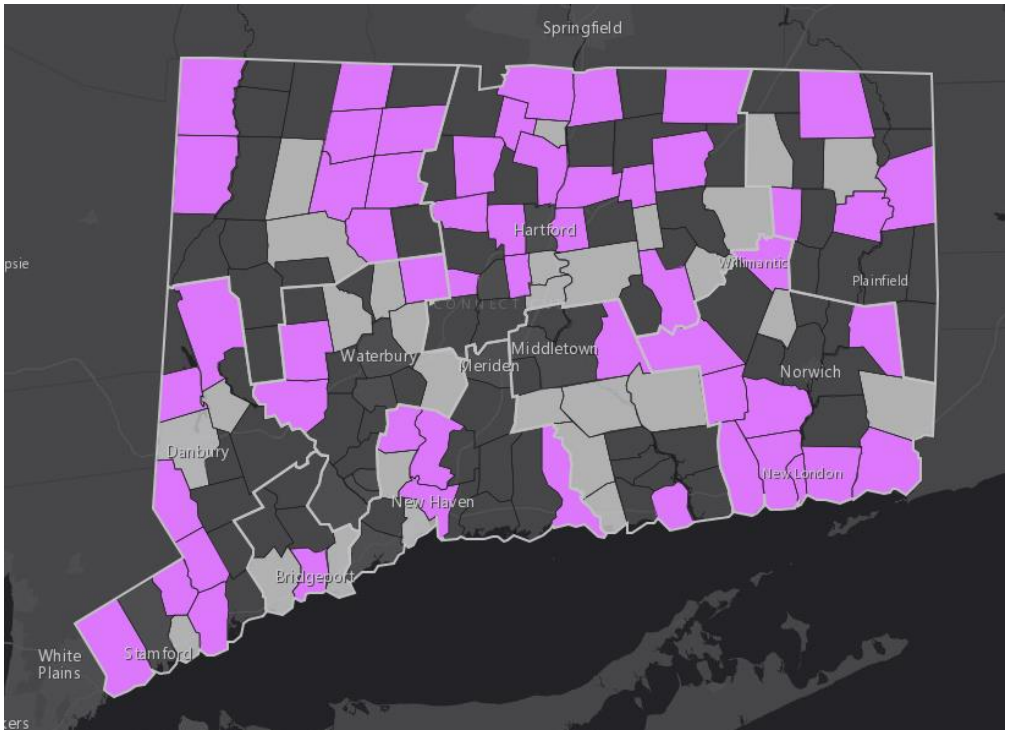
Regs Review Results

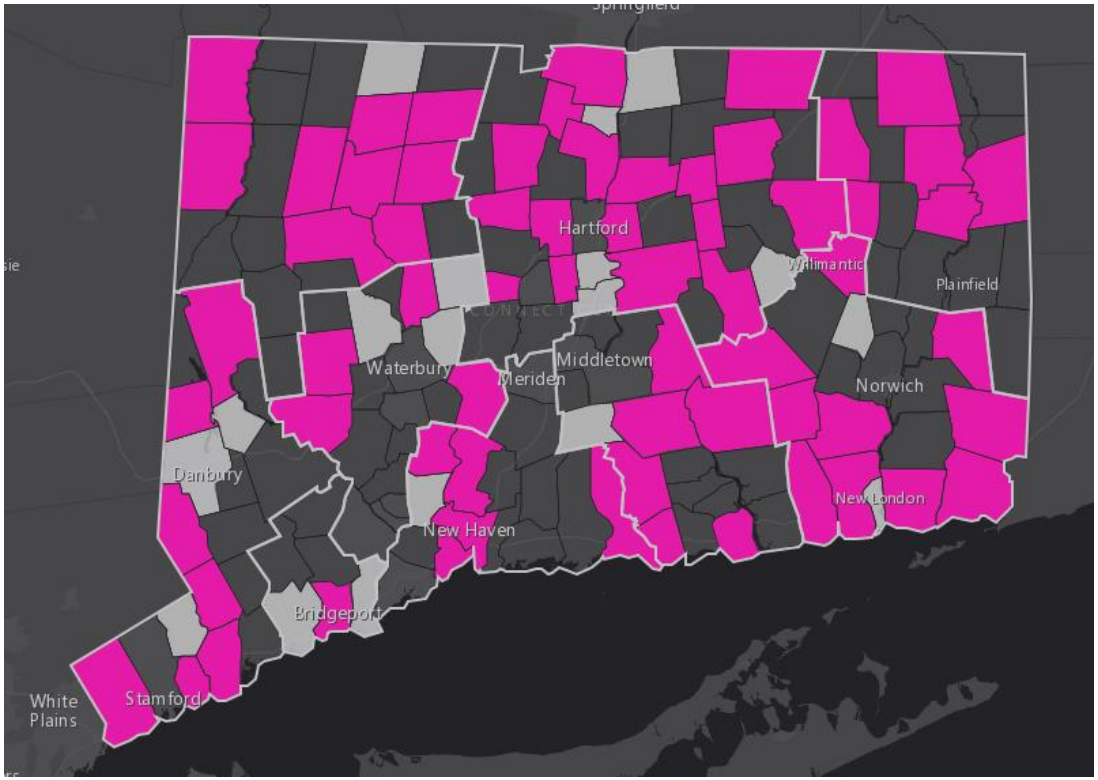


General Support for LID



54 of 85 towns
mention LID in regs

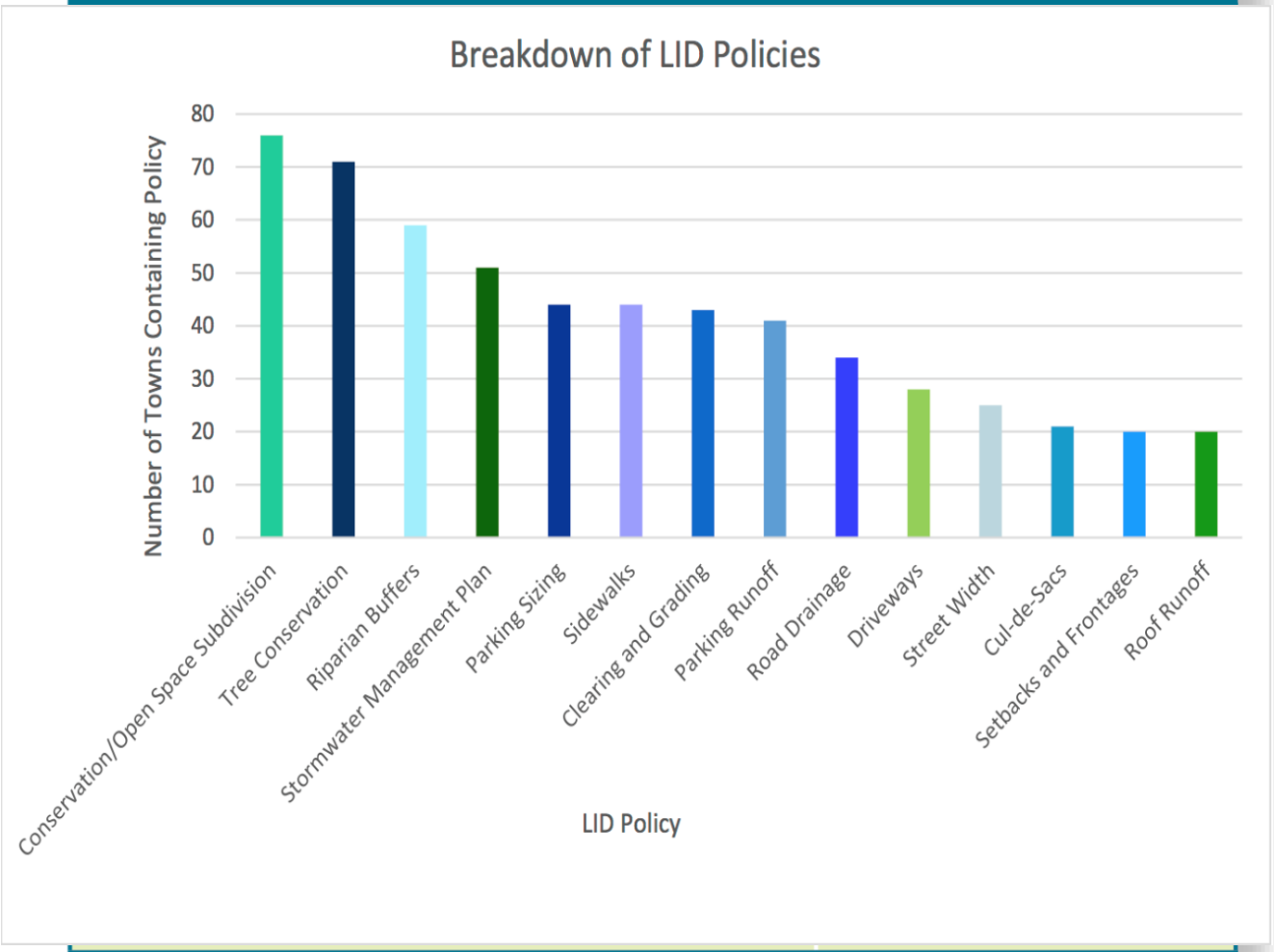
General Support for LID



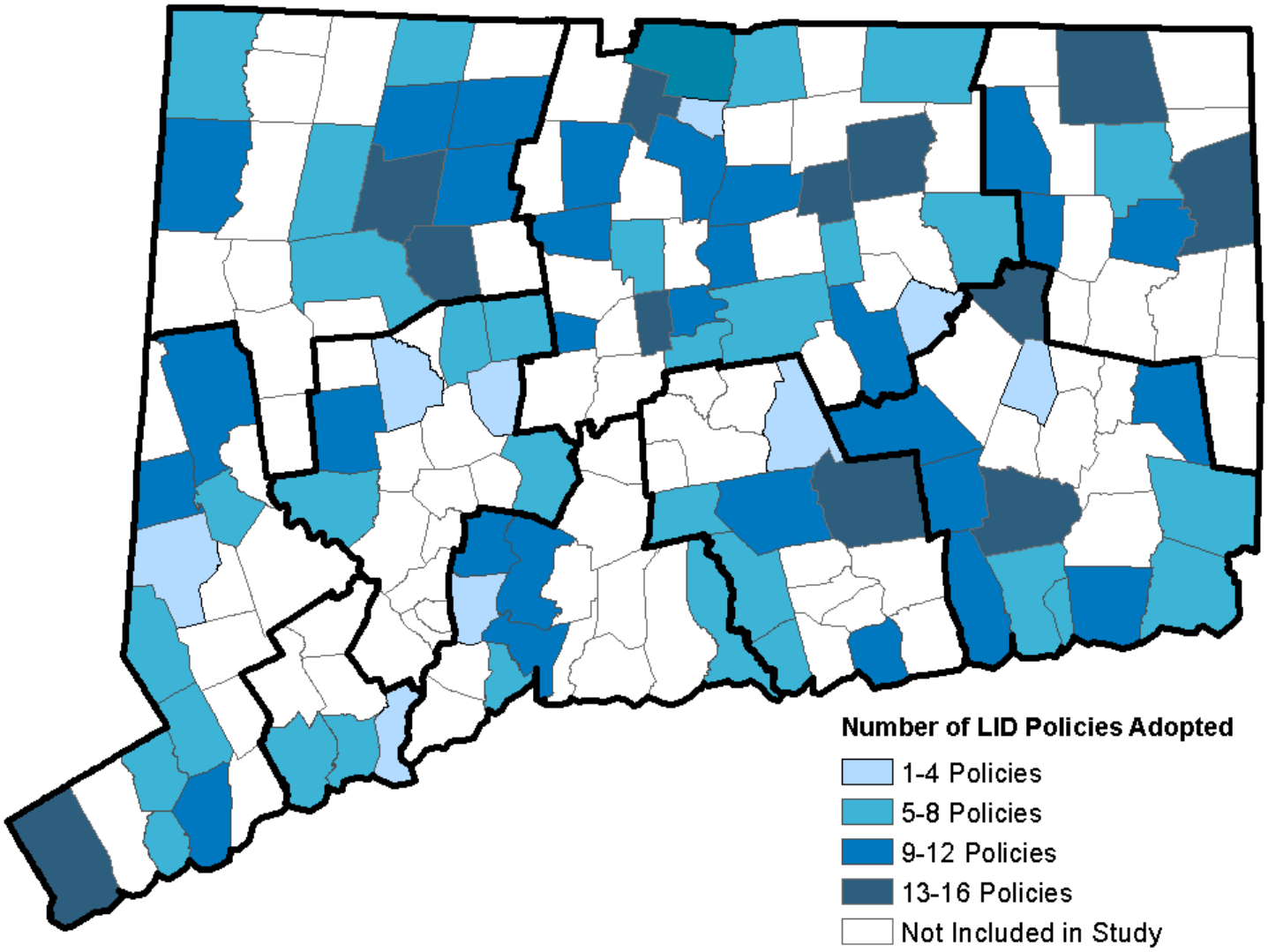
65 of 85 towns mention
reducing impervious surfaces

Specific Regulations

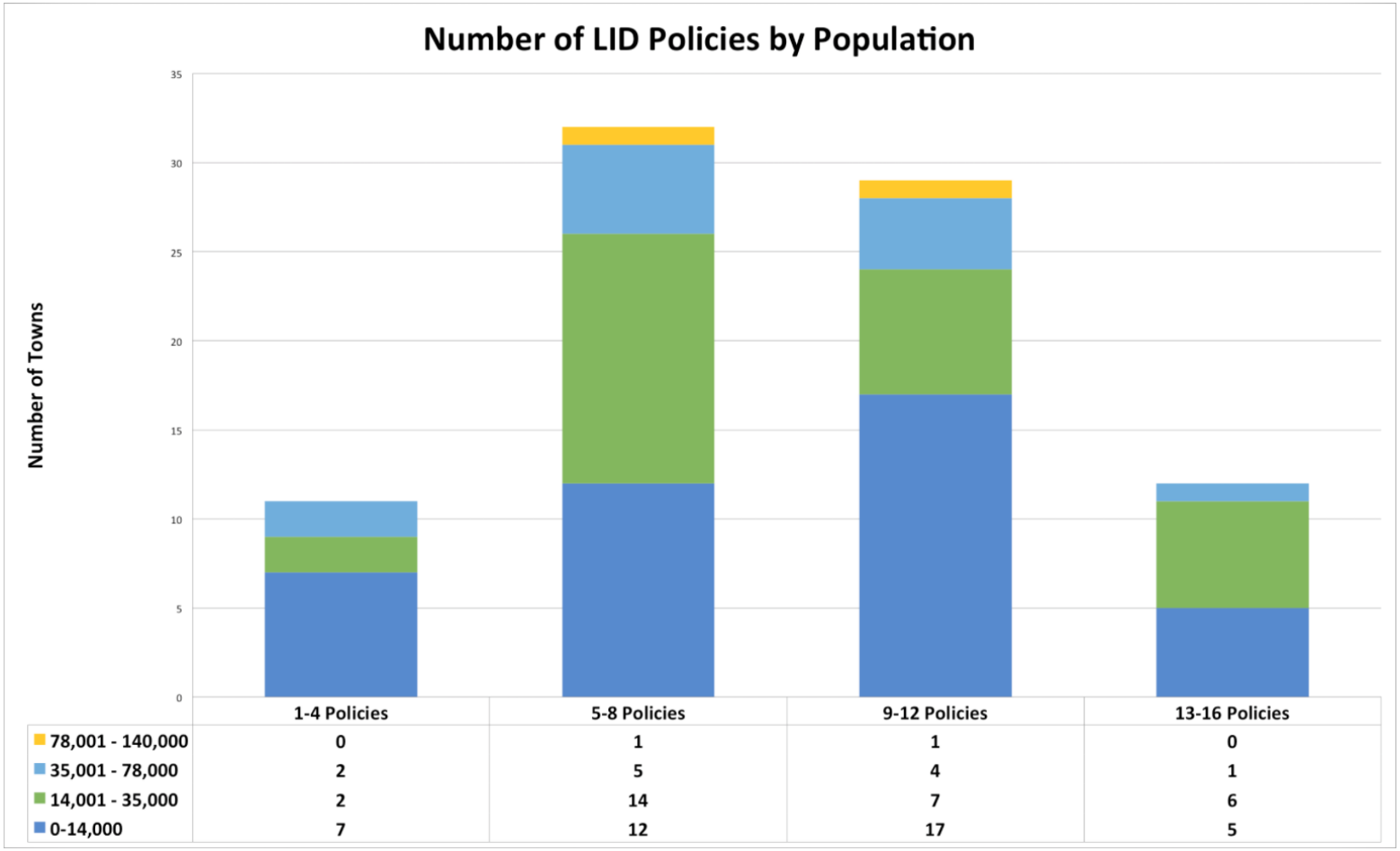
LID Practices by Number of Towns Adopted



Policies Adopted by Town

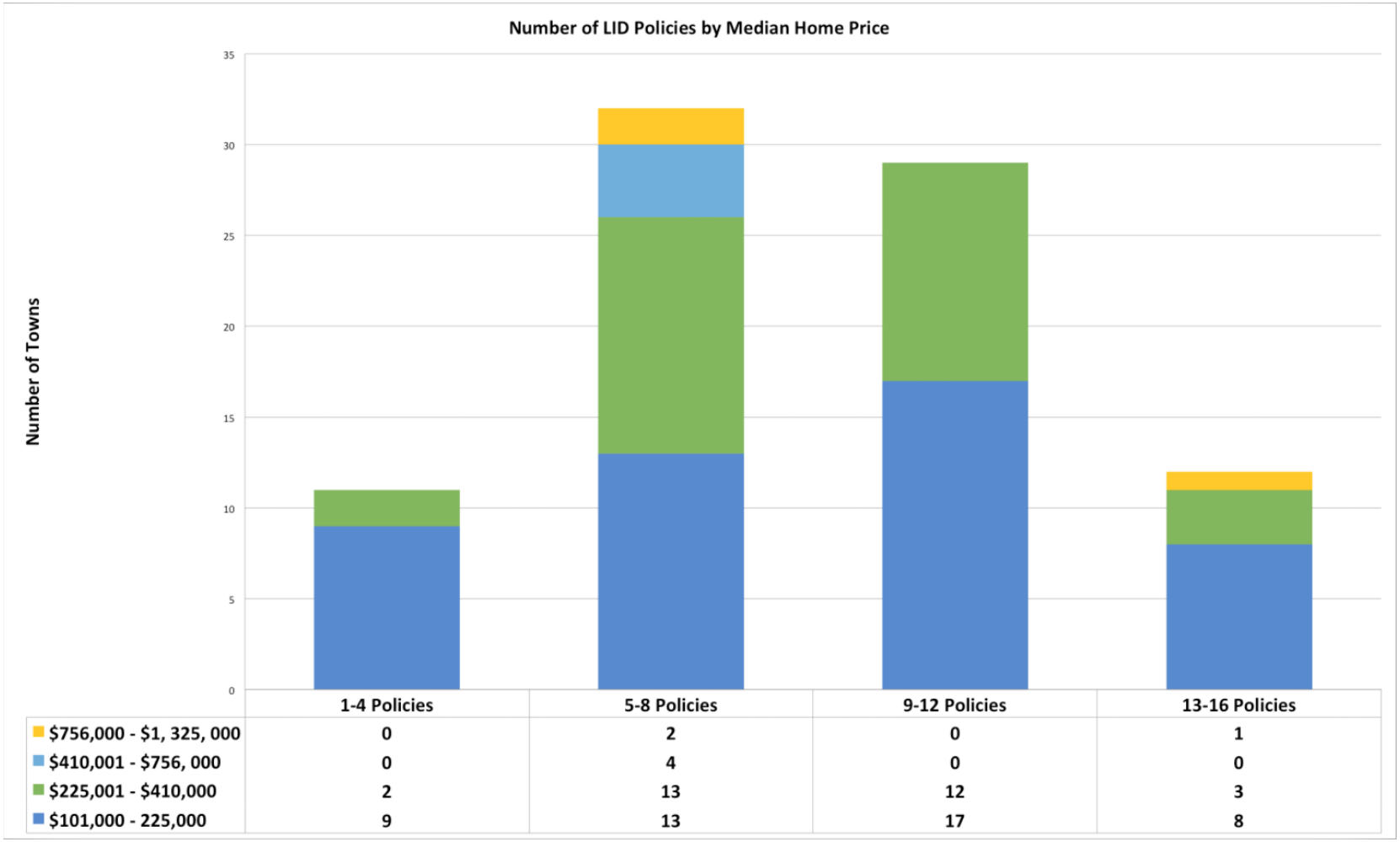


Does size matter?



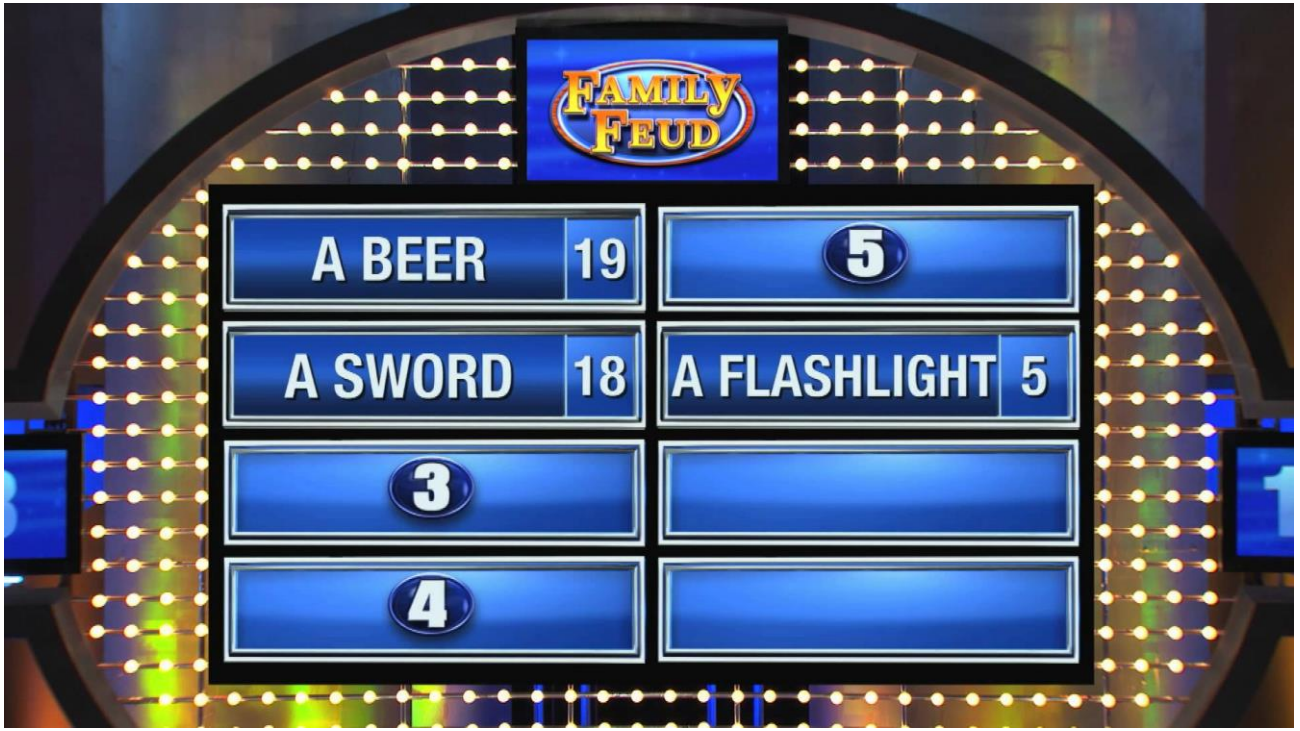
	1-4 Policies	5-8 Policies	9-12 Policies	13-16 Policies
78,001 - 140,000	0	1	1	0
35,001 - 78,000	2	5	4	1
14,001 - 35,000	2	14	7	6
0-14,000	7	12	17	5

Does wealth matter?

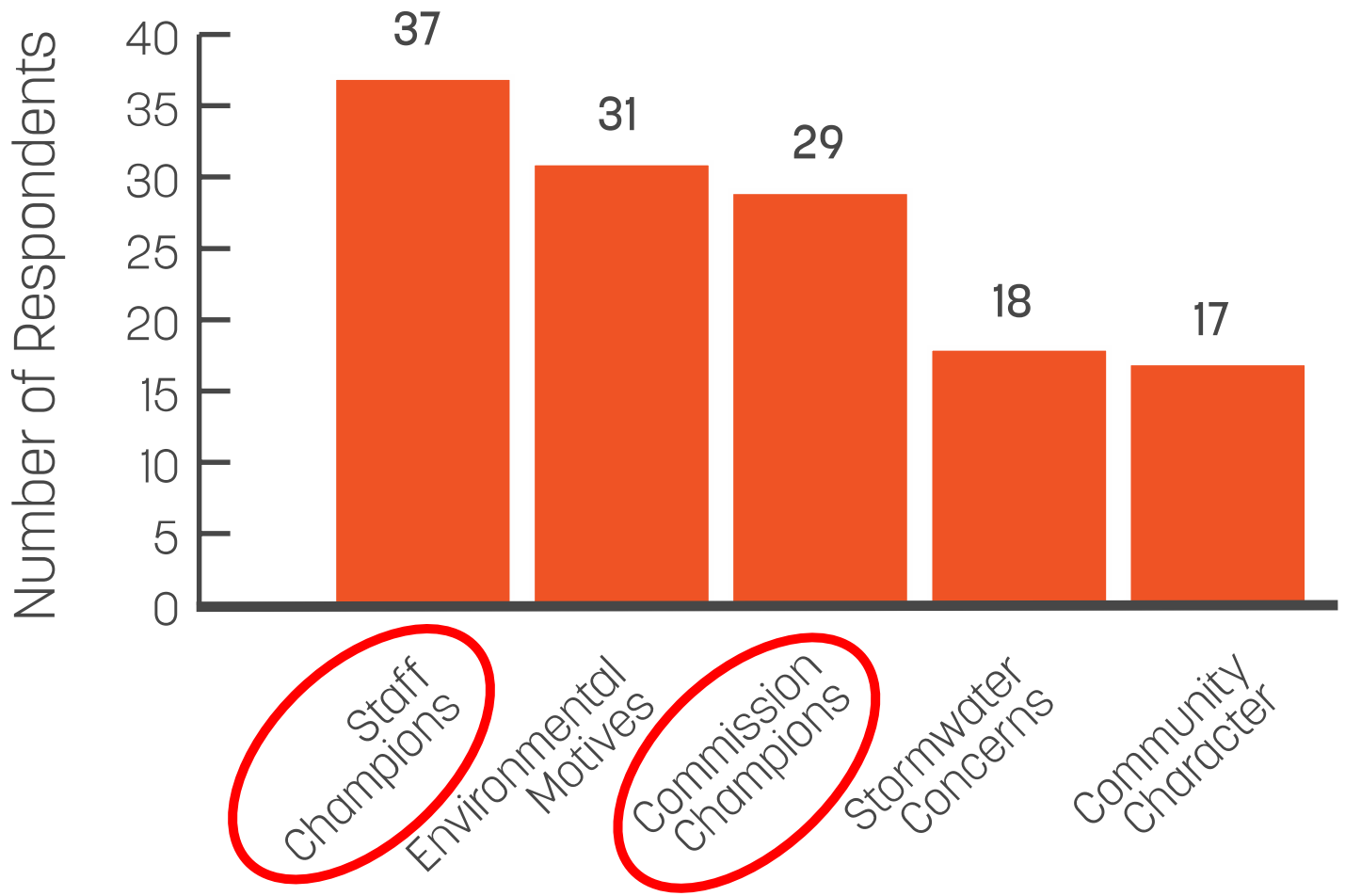


	1-4 Policies	5-8 Policies	9-12 Policies	13-16 Policies
$756,000 - $1, 325, 000	0	2	0	1
$410,001 - $756, 000	0	4	0	0
$225,001 - $410,000	2	13	12	3
$101,000 - 225,000	9	13	17	8

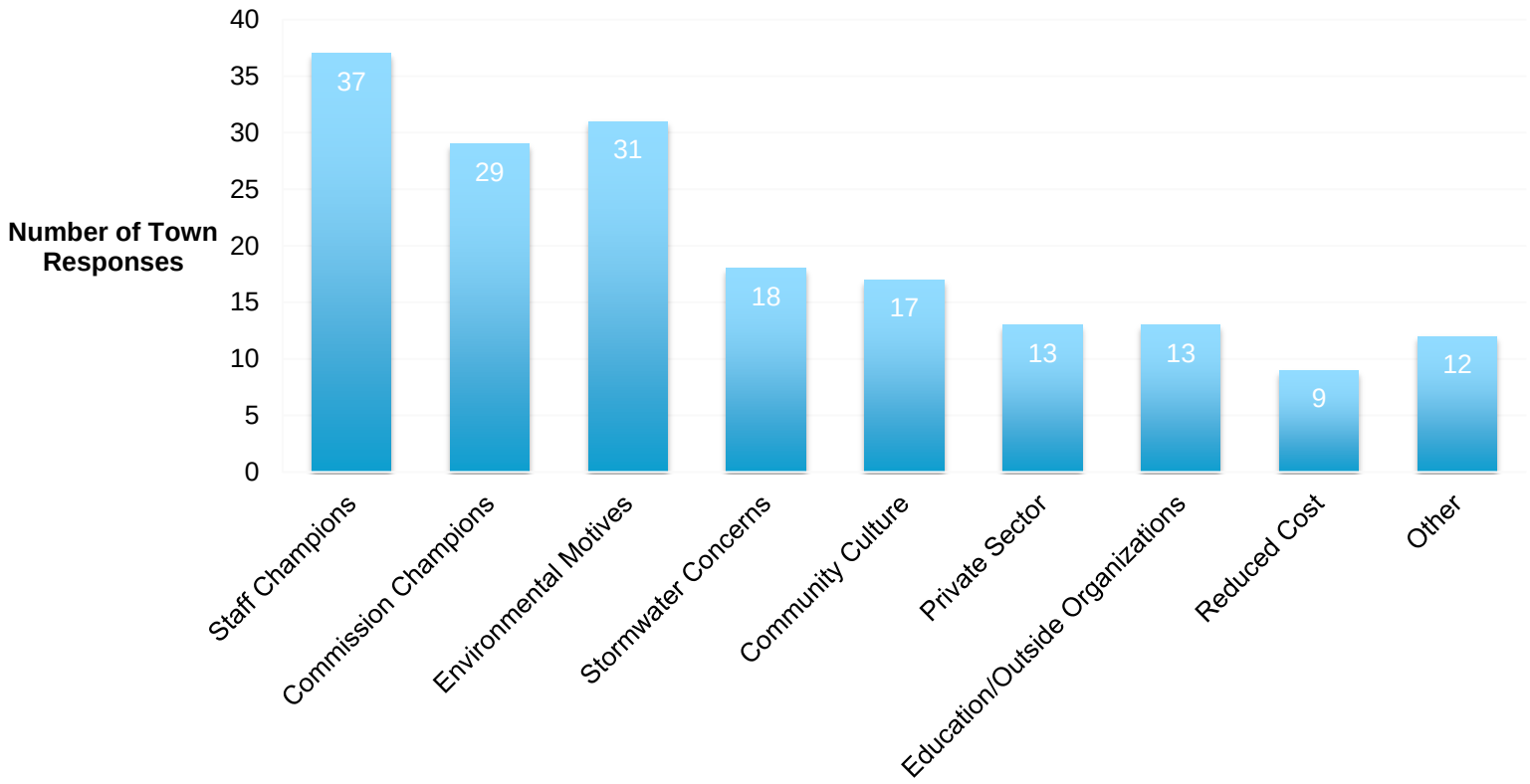
Interview Results



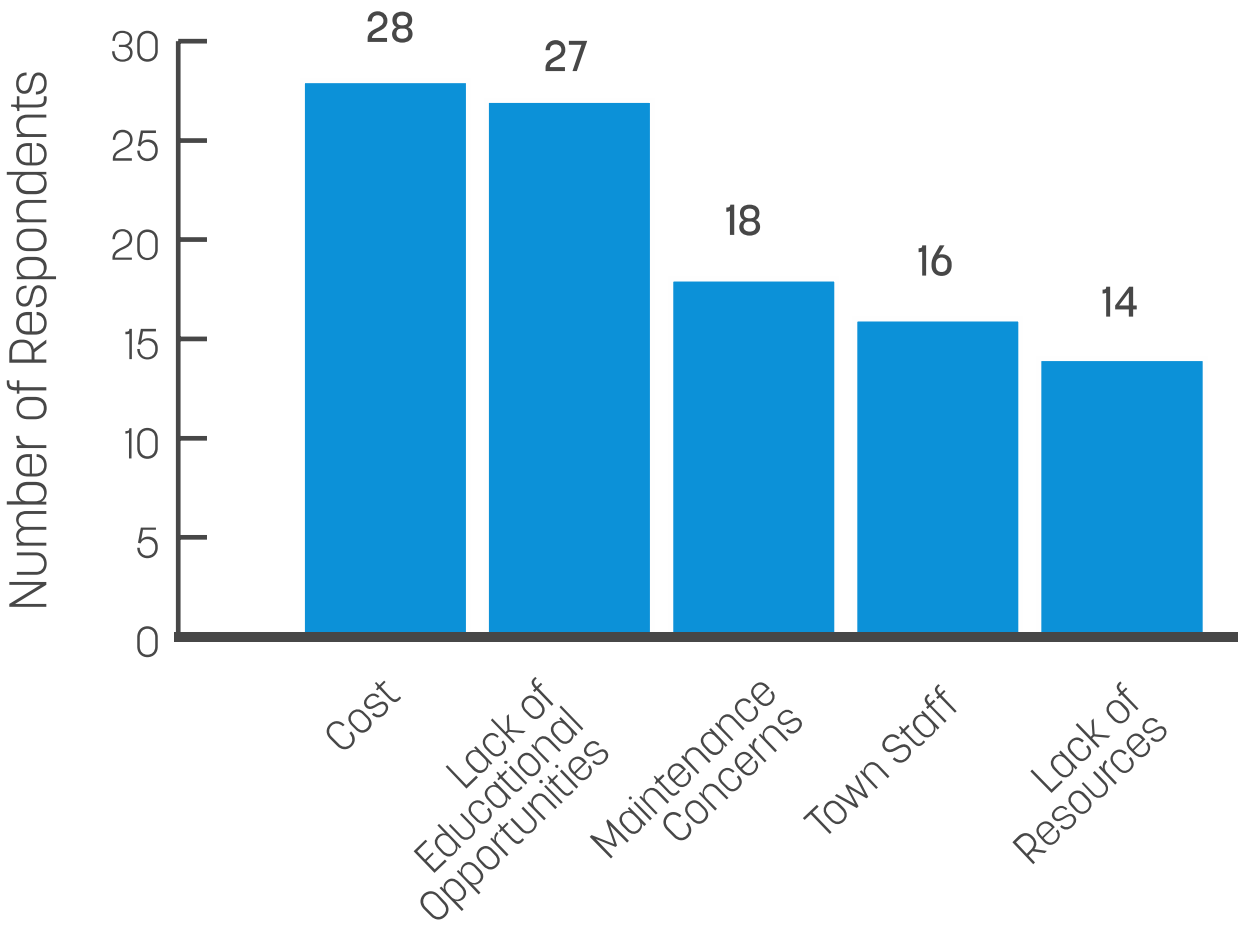
Top 5 LID Drivers



All LID Drivers



Top 5 LID Barriers



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

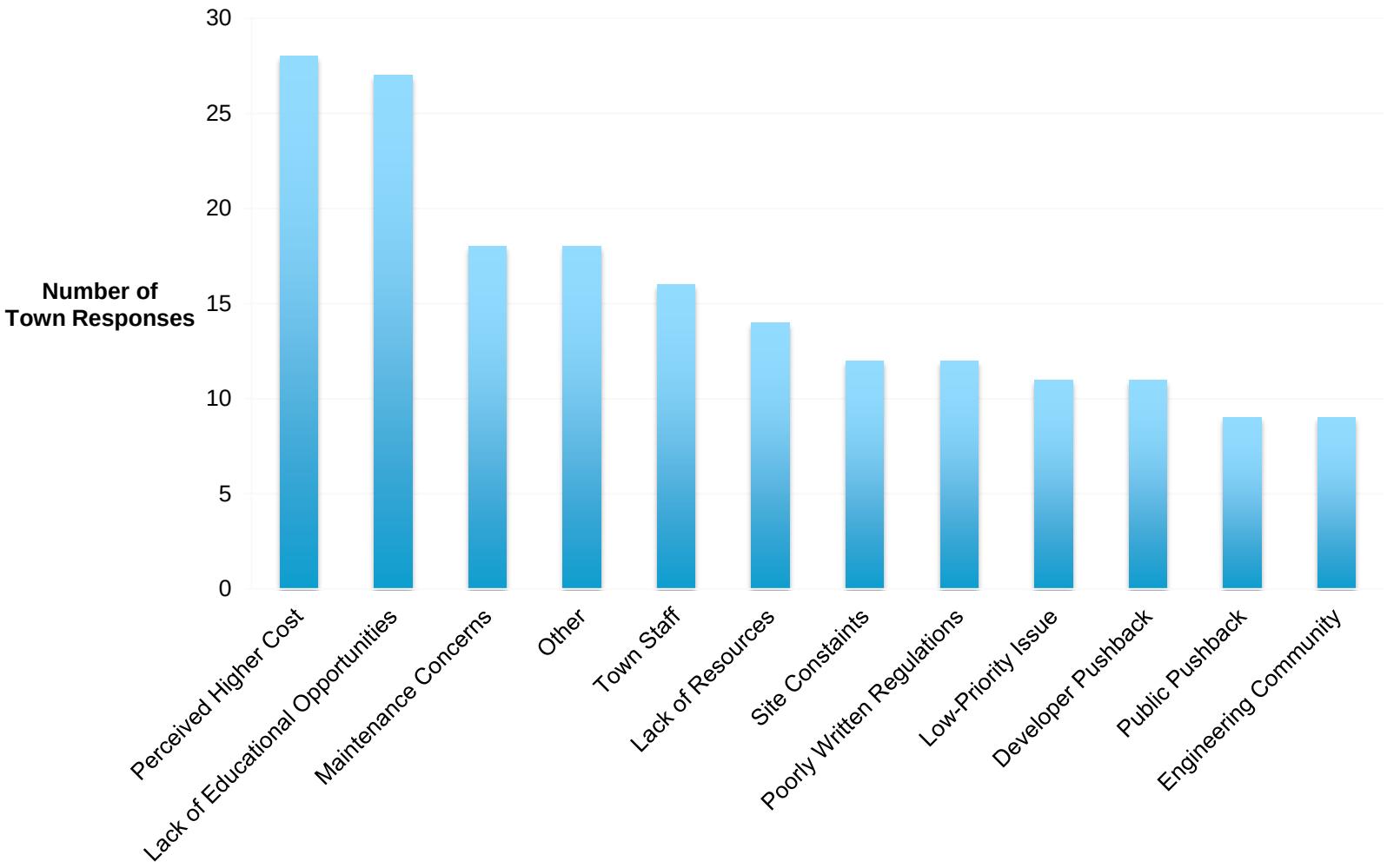
Maintenance: difficult to keep track of LID, maintenance concerns

LID Barriers

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



What it all means

- Education is still key – finding champions & removing obstacles
- Many barriers are an education issue
- Maintenance challenge – who is responsible?

State of LID StoryMap

http://s.uconn.edu/stateoflid

Thanks

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