

Encouraging LID: A bylaw review analysis



conserve



restore



protect



save money

Dover Planning Board
January 9, 2017

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FOUNDATION FOR METROWEST



Agenda

- Grant information
- Background of issue and goals
- Overview of recommendations
- Next steps
- Questions



Thank You



FOUNDATION FOR METROWEST



What is Low Impact Development?

“ LID is an approach to land development (or re-development) that **works with nature to manage stormwater** as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing **site** drainage that **treat stormwater as a resource** rather than a

- EPA



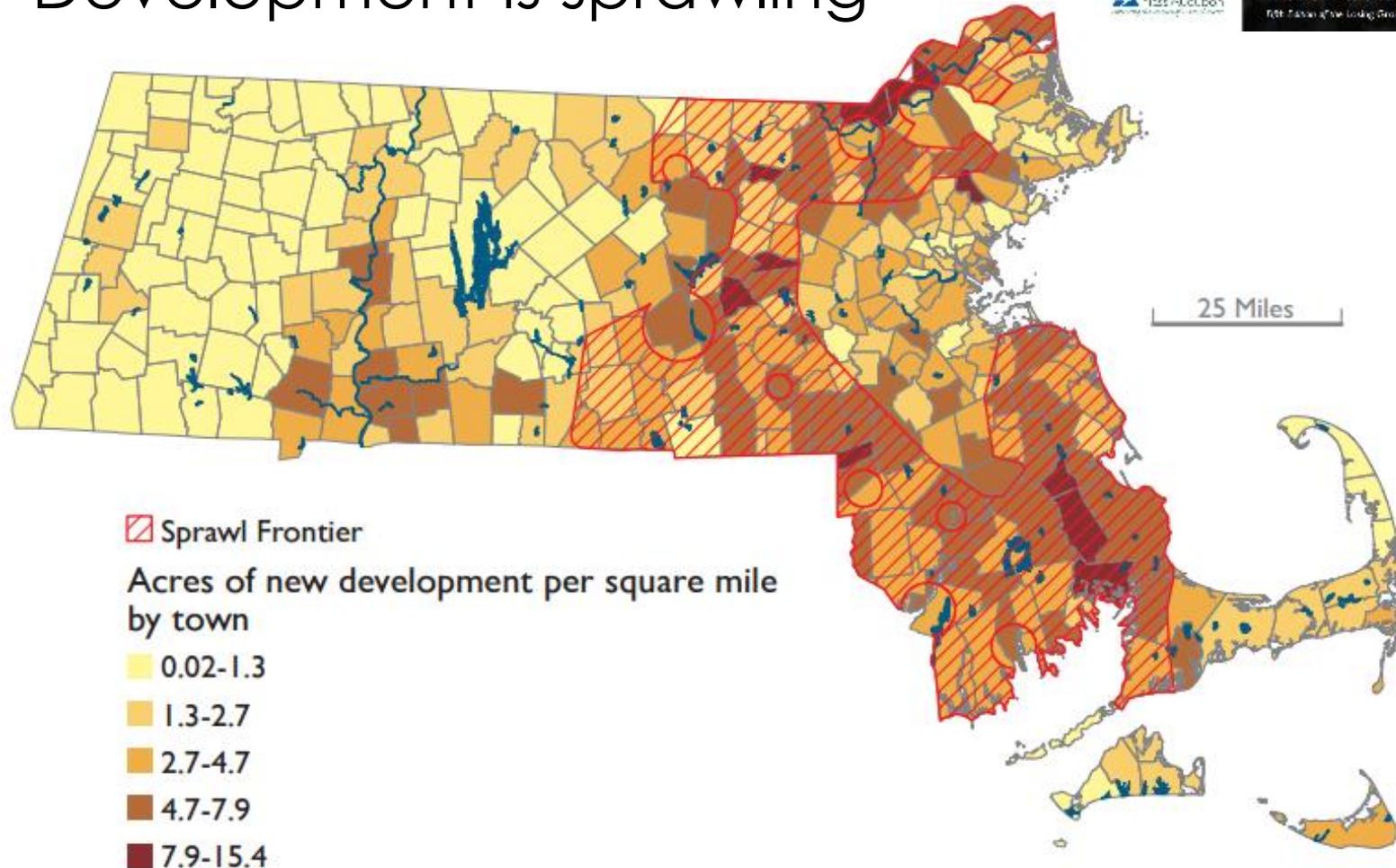
Source: Whole Buildings Design Guide, wbdg.com

What's the Problem?

Development is sprawling



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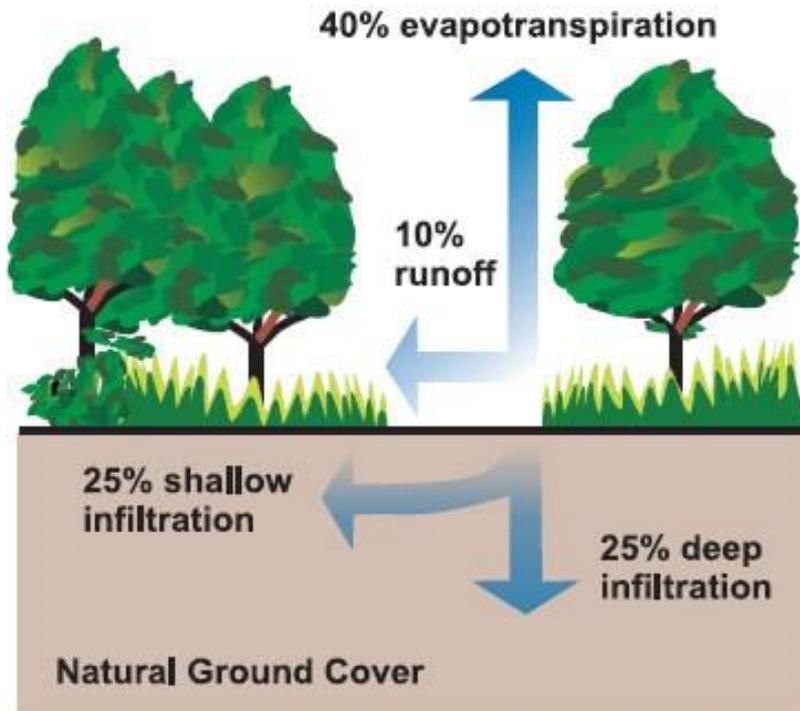


What's The Problem?

Impervious surface



Runoff



Source:
EPA

Impacts of Stormwater Runoff



We Need to Change Course

Traditional development



Impervious surfaces



Stormwater runoff



Water quality

impairment
Infrastructure
impacts



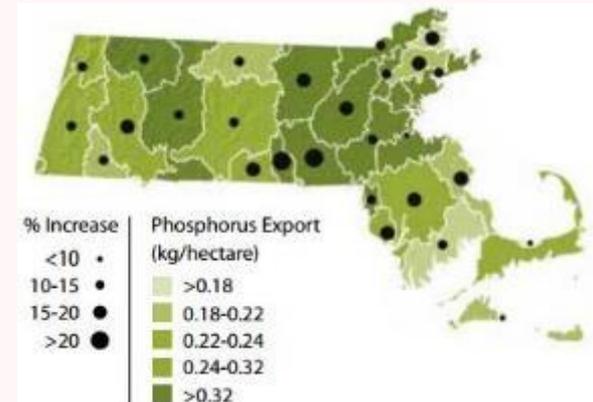
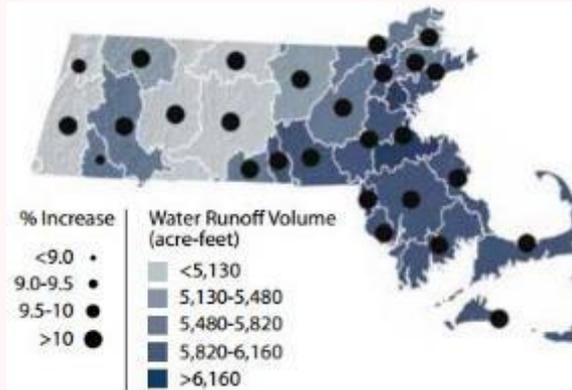
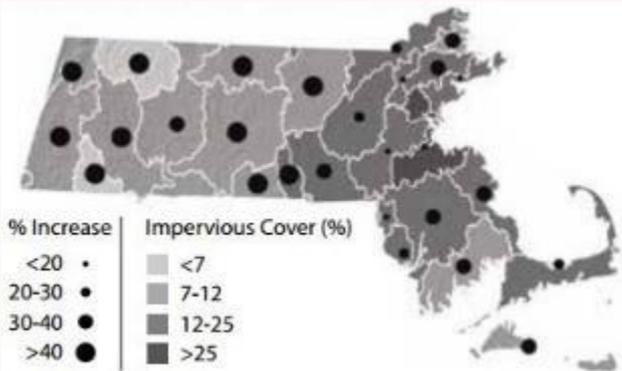
Financial and
regulatory
burden



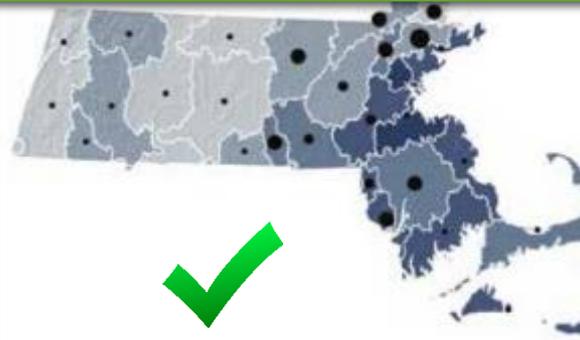
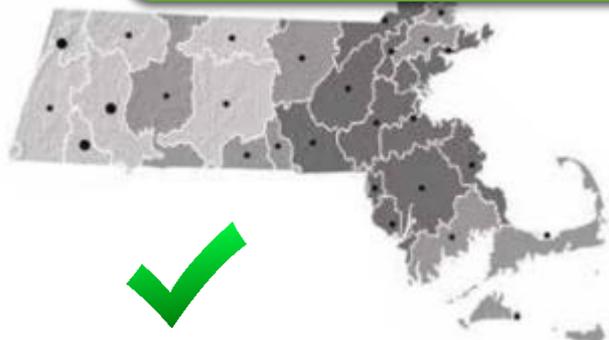
The Value of Green: Impervious, Runoff, Nutrients

Source: Harvard Forest *Changes to the Land 2*

If we continue to follow opportunistic growth, in 2060:



These allow for nearly the **same amount of development**, but 2/3 of it is **clustered** development



A Different Direction: Greening Your Community

James C. Engberg

Sustainable
development



Increased
infiltration



Reduced
runoff &
more
groundwater



Improved
water
quality

Intact
infrastructure



Regulations met
Money saved



Benefits of LID Practices

Benefit	Reduces Stormwater Runoff				Increases Available Water Supply	Increases Groundwater Recharge	Reduces Salt Use	Reduces Energy Use	Improves Air Quality	Reduces Atmospheric CO ₂	Reduces Urban Heat Island	Improves Community Livability					Improves Habitat	Cultivates Public Education Opportunities
	Reduces Water Treatment Needs	Improves Water Quality	Reduces Grey Infrastructure Needs	Reduces Flooding								Improves Aesthetics	Increases Recreational Opportunity	Reduces Noise Pollution	Improves Community Cohesion	Urban Agriculture		
Practice																		
Green Roofs	●	●	●	●	○	○	○	●	●	●	●	●	◐	●	◐	◐	●	●
Tree Planting	●	●	●	●	○	◐	○	●	●	●	●	●	●	●	●	◐	●	●
Bioretention & Infiltration	●	●	●	●	◐	◐	○	○	●	●	●	●	●	◐	◐	○	●	●
Permeable Pavement	●	●	●	●	○	◐	●	◐	●	●	●	○	○	●	○	○	○	○
Water Harvesting	●	●	●	●	●	◐	○	◐	◐	◐	○	○	○	○	○	○	○	●



Yes



Maybe



No

Start Here.

Conserve the natural green infrastructure already providing free ecosystem services

Incorporate LID and green infrastructure design into development

Restore the resiliency of urban landscapes through LID in redevelopment



conserve



restore



protect



save money

Conserve

Conserve the natural green infrastructure already providing free ecosystem services

Integrate LID and green infrastructure designs into current development

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D in

Integrate

Conserve the natural green infrastructure already providing free ecosystem services

Integrate LID and green infrastructure designs into current development projects

of urban landscapes through LID in redevelopment



Restore

Conserve the natural green infrastructure already providing free ecosystem services

Integrate LID and green infrastructure designs into current development projects

Restore the resiliency of urban landscapes through LID in redevelopment



Free Ecosystem Services:

Free services provided by the natural landscape

Every \$1 invested in land conservation offers a **\$4 Return on Investment** in terms of these ecosystem service values

- **Flooding:** Floodplains provide flood protection and reduce infrastructure damage
- **Public Health:** Managing stormwater and reducing retention ponds reduces creation of mosquito habitat
- **Air Quality & Public Health:** Trees reduce the urban heat island effect, reducing smog creation and resulting asthma occurrences as well as reducing nitrogen dioxide and particulate matter
- **Water Quality:** Streamside vegetation filters pollutants and reduces erosion
- **Water Quantity:** Forests and wetlands store water, improve water quality, and recharge groundwater
- **Recreation:** Clean, flowing waters support recreation, including boating, fishing, and swimming while open space provides areas for hiking and biking
- **Quality of Life:** Open space and street trees create a more enjoyable walking environment, benefiting community connection, health, and economic benefit in downtowns and commercial areas

Land Protection = Water Protection

- Quabbin & Wachusett Reservoirs serve 2.5 million
- Over 20 years, Massachusetts Water Resources Authority spent \$130M to protect 22,000 acres of watershed lands
- Avoided ratepayer cost of \$250M on a filtration plant and



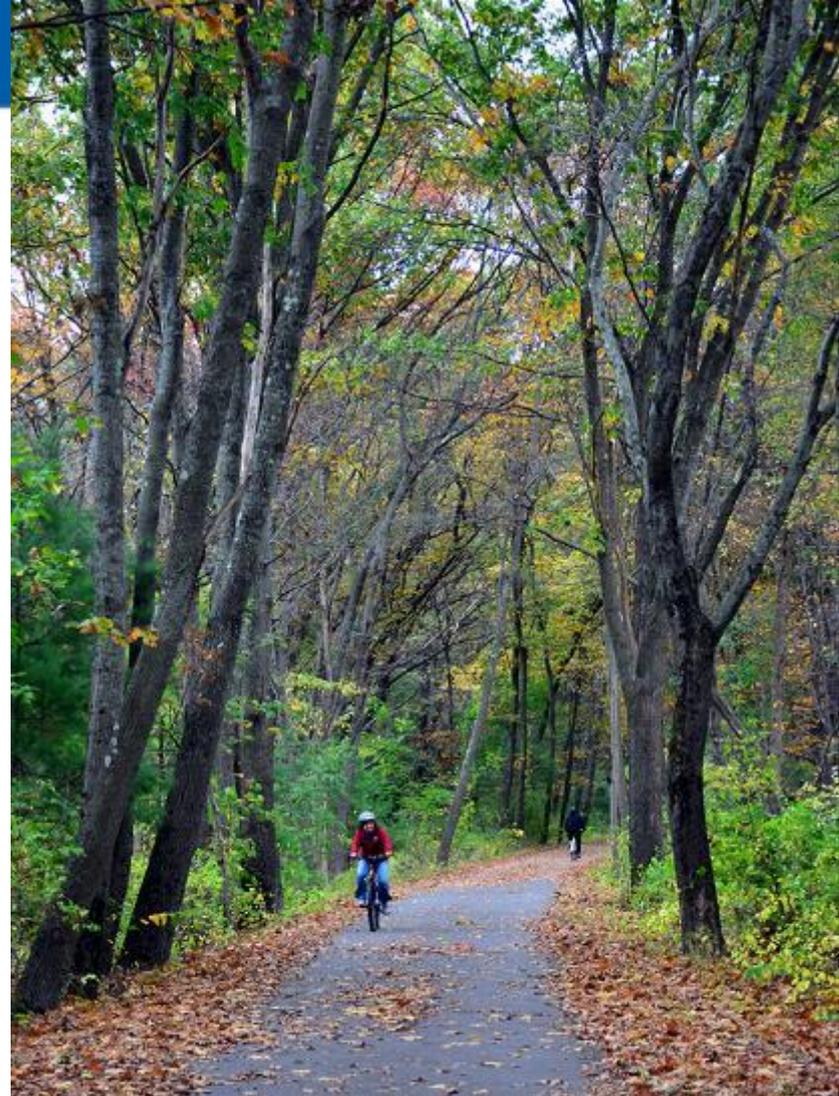
The Power of a Bylaw: Westford

- Adopted a Conservation Subdivision bylaw in 1978
- Requires developers to submit both conservation and conventional & Planning Board chooses preferred
- 48 developments protected over 1,700 of



The Power of a Bylaw: Westford

- Preserved local habitat
- Protected water resources
- Created 13 miles of hiking trails & public recreation
- Town didn't have to purchase the land themselves, saving millions of dollars



Rail Trail in Westford

Open Space Residential Development Zoning

- Adopt state's four-step OSRD best practice model in order to encourage sustainable development practices that consider the natural landscape and conserve key green infrastructure areas



Zoning

- Dimensional standards can be reduced to allow flexibility
- Limiting clearing and grading
- Specifically address and encourage LID
- Match Wetlands Protection Regulations that recognize importance of forested buffers and other vegetated areas



Subdivision Rules & Regs

- Encourage LID BMPs
- Allow common drives (currently not permitted)
- Specifically encourage minimizing clearing and grading and encourage tree retention
- Narrow roadways (currently 52-60' ROW)



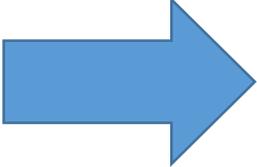
Site Plan Review

Currently does not address any of factors reviewed in analysis

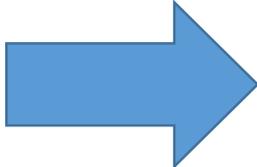
- Limit clearing, grading; retain vegetation and limit soil removal
- Allow easy siting of LID features such as bioswales
- Limit impervious surfaces
- Allow rooftop runoff into swales/other infiltration



Stormwater/LID Bylaw



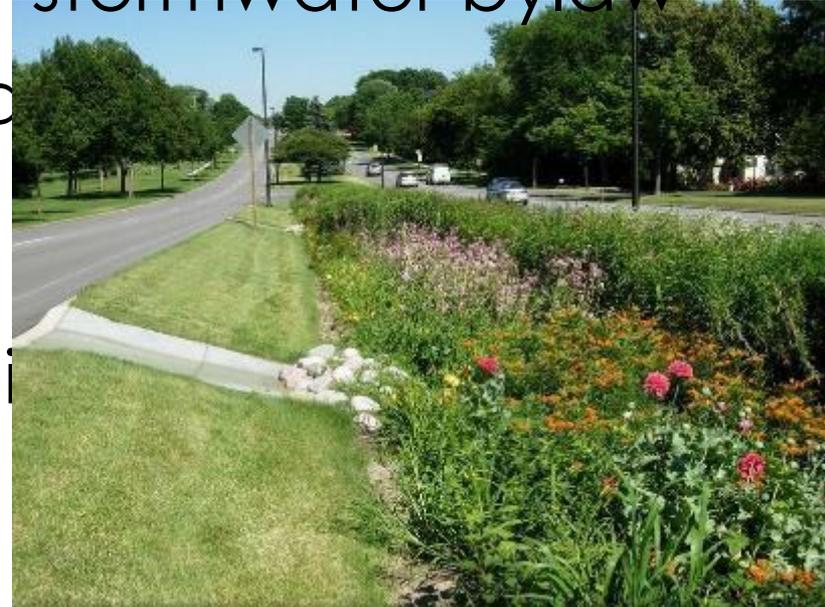
Update
stormwater
bylaw



Adopt LID bylaw for
ease of reference
in other areas or
define in
stormwater bylaw

Address:

- Minimize impervious area
- Manage soils
- Native planting
- Minimize clearing, grubbing
- LID



Wetlands Protection Rules/Regs

- Development of large parcels adversely affects resource areas
- ConComm may review subdivisions/parcels over five acres to protect natural landscape features and allow native plantings



Next Steps

- Decide which changes are right for you
 - Politically feasible
 - Administrative changes that are supported (subdivision)
 - Long term strategy for changes requiring TM
- Take steps to meet MS4 regulations
- Increase community outreach & public awareness



Stay in Touch!

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Learn more at
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mapc.org

