

Municipal Vulnerability Preparedness (MVP)





State and local partnership grant to build resiliency to climate change







MVP Program

Learn more





https://www.mass.gov/municipal-vulnerability-preparedness-program

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Reviewing Bylaws to Encourage Climate Smart Solutions

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Outline for our Webinar

I. Low Impact Development (LID) 101

Laying the ground for climate-smart, nature based solutions

2. The power of bylaws and why to review them

Plan for the community you want to have with smart regulations

3. Reviewing bylaws & regs and what's next

How to use the framework to review local regs

4. Q&A

You can type questions throughout the webinar



Sources: Fourth National Climate Assessment, NOAA Ocean Service, NOAA nClimDiv dataset, ACIS



You get what you zone for

Communities often unintentionally discourage climate-smart development by...

- Requiring large lots
- Requiring strict dimensional requirements
- Prohibiting curb cuts for drainage
- Requiring wide, curbed roads
- Requiring invasive species
- Not prioritizing LID
- Not prioritizing preservation of natural features



Avoid sprawl through climatesmart zoning and regulations

- I. Protect natural resources and open space
- 2. Promote efficient, compact development patterns and infill
- 3. Smart designs that reduce overall imperviousness
- 4. Adopt GI Stormwater management provisions (LID)
- 5. Encourage efficient parking

Factors	Conventional	Better	Rett	
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Preserving natural features offers numerous benefits

Every **\$1** invested in land conservation offers a **\$4** Return through:

- 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
- **Property Value**: Healthy, mature trees add an average of 10-30% to a property's value

Balancing conservation and development via OSRD

Open Space Residential Design (OSRD); Natural Resource Protection Zoning (NRPZ); Conservation Design; cluster development





How to design OSRD

- **I. Calculate** the traditional amount of allowed lots (removing unsuitable building areas, including wetlands)
- **2. Identify** significant natural, cultural, or historic features
- **3. Concentrate** development away from these features through flexible requirements to achieve a similar amount of lots
- **4. Preserve** permanently at least half of the land, whether for natural, agricultural, or forest use



Randall Arendt <u>Rural by Design</u>

If we all had OSRD... nutrients, impervious, phosphorus Source: Harvard Forest Changes to the Land 2014

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



Site-specific solutions via Low Impact Development

6 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 waste product. 99



Options & benefits of LID



Source: Center for Neighborhood Technology's The Value of Green Infrastructure

Examples of GI & LID and how to get there

Conserve the natural green infrastructure already providing free ecosystem services Integrate LID and green infrastructure design into development Restore the resiliency of urban landscapes through LID in redevelopment





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



Integrate

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



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





Curb cut for bioswales; vegetation between road and sidewalk

Underground utilities, tree box filters between road and sidewalk





MVP Example: identified intersection that floods?



Bioretention bump outs & street trees can help to...

- capture & filter excess water alleviate pressure on MS4
- improved pedestrian safety better visibility, shorter walkway
- enhance aesthetics to encourage visitors & walking

without altering existing parking or bus stops

Q: But how do we encourage this in <u>redevelopment?</u>

> A: Encourage it in all development first. Write it down, make it a priority, and use it to back you up

Climate smart is budget smart Reduced clearing & grading costs

- A 20-unit development with two-acre lots requires 40 acres to be cleared and graded
- Conservation subdivisions offer the same amount of housing but preserve 50% of land – and \$200,000+



The more land you save, the more money you save.

Climate smart is budget smart Reduced paving costs

Road Diets

Narrowing just 2 miles of road by 4 feet/lane saves



Plus savings on repair, salting, plowing...

Not building the road through a sprawling development in the first place? Savings grow to the *millions*.

The power of a bylaw: Westford

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



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

If you forget everything I just said... it's right here.

Balancing

Competing Priorities & **Cost-Effective Solutions**

Greening Your Community

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Greening Your Community

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We Need to Change Course

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Mass Audubon



massaudubon.org/lidfactsheets

Factors	Conventional	Better	Best	Down to nuts
Curbing	Curbing required full length both sides of road	Allow curb breaks or curb flush with pavement to enable water to flow to vegetated LID features	Open drainage with roadside swales and no curbs preferred	and bolts!
Roadside Swales	Allowed as an option	Preferred over closed drainage	Preferred, with criteria f proper design.	How to review
Utilities	Off sets required contributing to wide road ROWs	Not specified, flexible	Allow under road, sidewalks or immediately adjacent to roads to enable placement of roadside swales.	• Zoning
Sidewalks	Concrete or bituminous	Some flexibility in material and design	Prefer permeable pavement	• Subdivision Rules
Sidewalks	Required both sides of road	Allow on only I side of road especially in low density neighborhoods	Prefer siting with land contours and for best pedestrian utility (e.g. connect with common areas and shared open spaces) – not necessarily immediately parallel to road.	 & Regulations Site Plan Review Stormwater or
Sidewalks	Drains to road closed drainage system	Not addressed	Disconnect drainage fro roa system – e.g. adjace green strips or within vegetated areas that can absorb sheet flow	 LID bylaw OSRD or cluster bylaw