

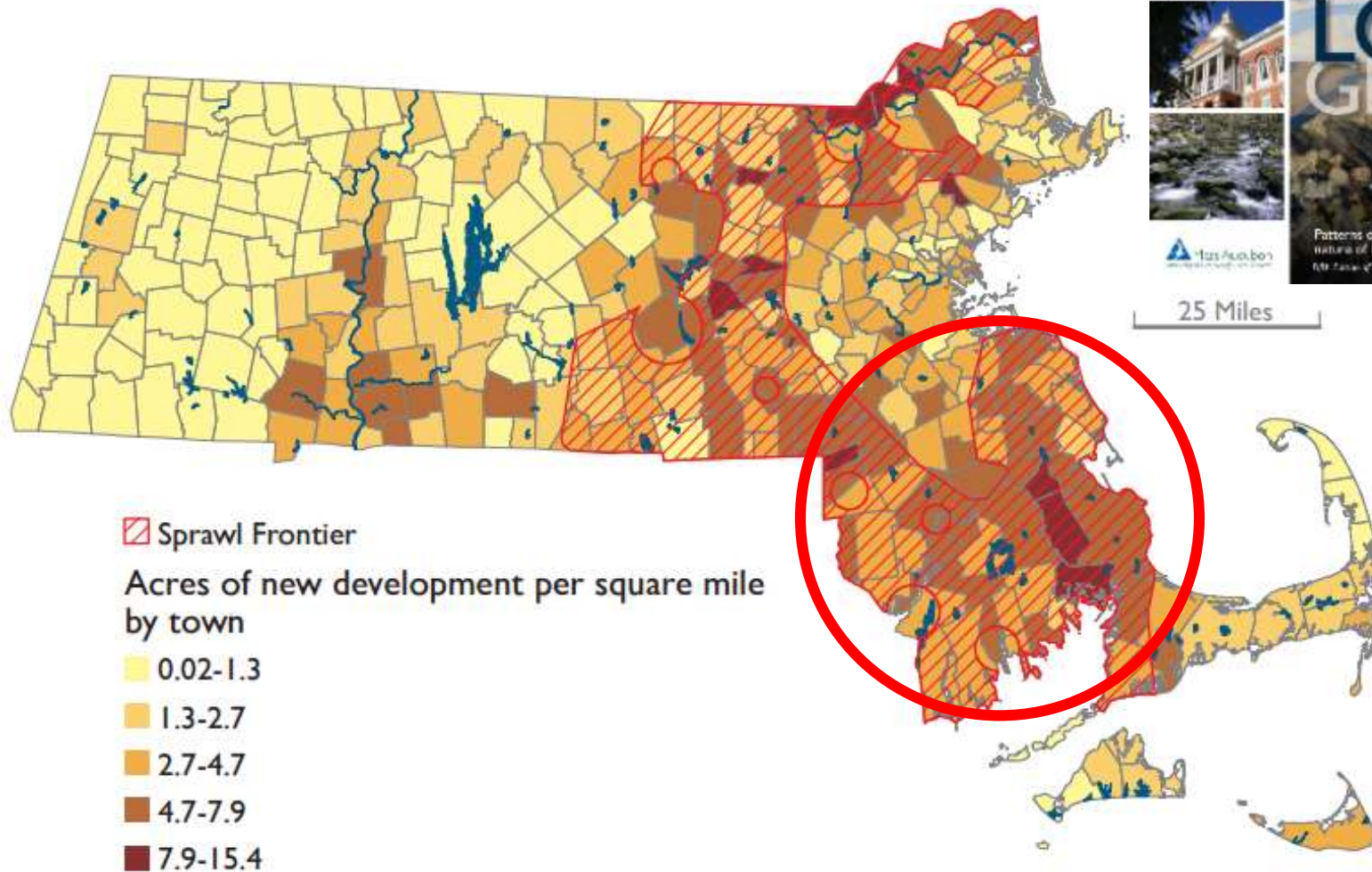


Valuing Green Infrastructure in a Changing Climate

**Stefanie Covino, Coordinator,
Shaping the Future of Your Community**
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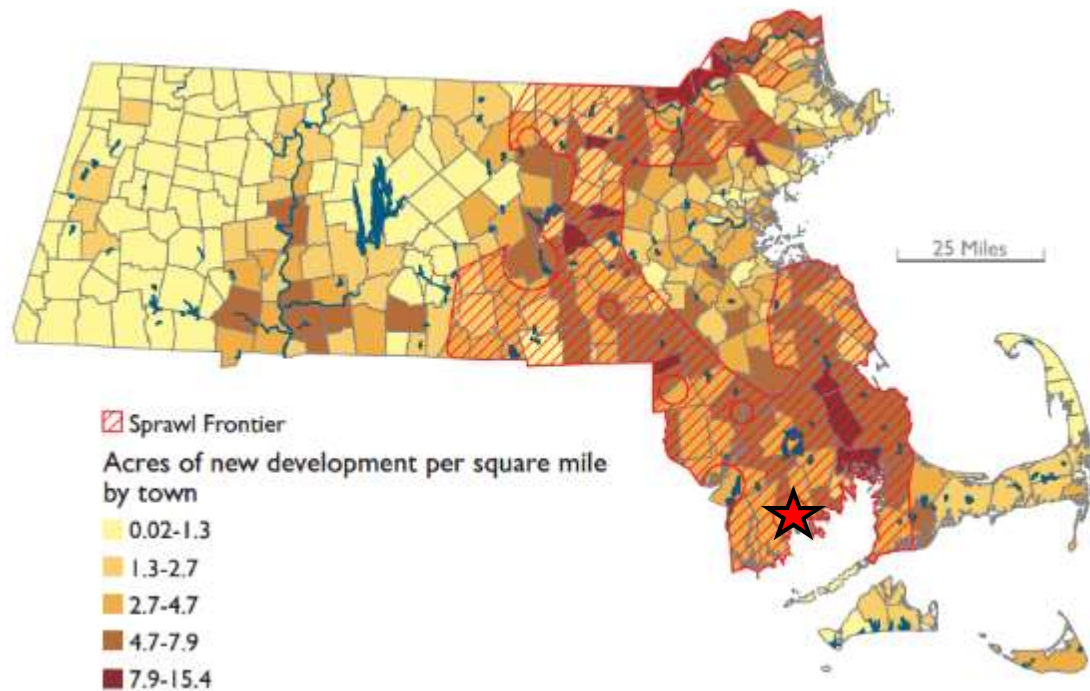
UMass Dartmouth
Summit on Climate Resilience
December 4, 2015

Development is Sprawling



Shaping the Future of Your Community

- Works with communities in fastest developing areas of MA to chart a more sustainable future
 - ✓ Customized workshops
 - ✓ Planning advice
 - ✓ Technical assistance



Traditional, sprawling development =

Less open space



=



Conservation and development working together

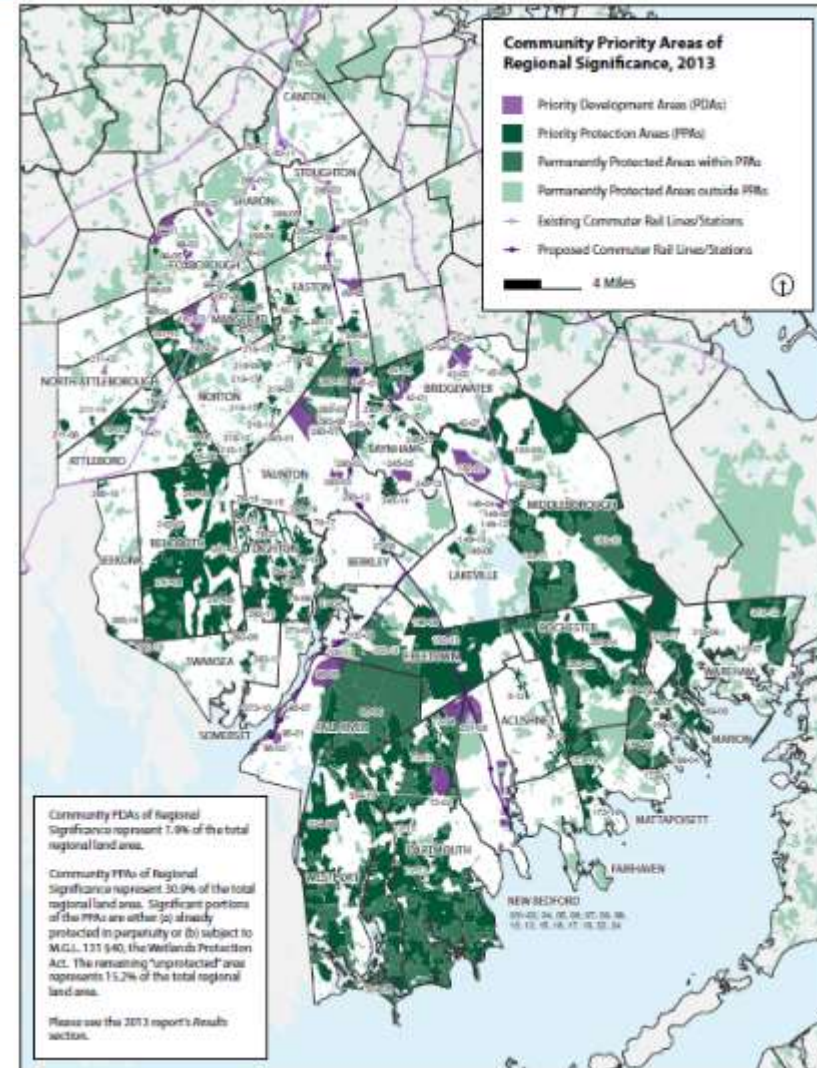
Areas of both

Priority Protection:

Important habitat and
Green Infrastructure

Priority Development:

Concentrate near
infrastructure and away
from important natural
resources



We need to change course

Sprawling development



Reduced green space



Water quality impairment

Infrastructure damage

Urban heat island effect

Increased stormwater

Habitat loss



This is a compounding issue exacerbated by climate change

climate
change

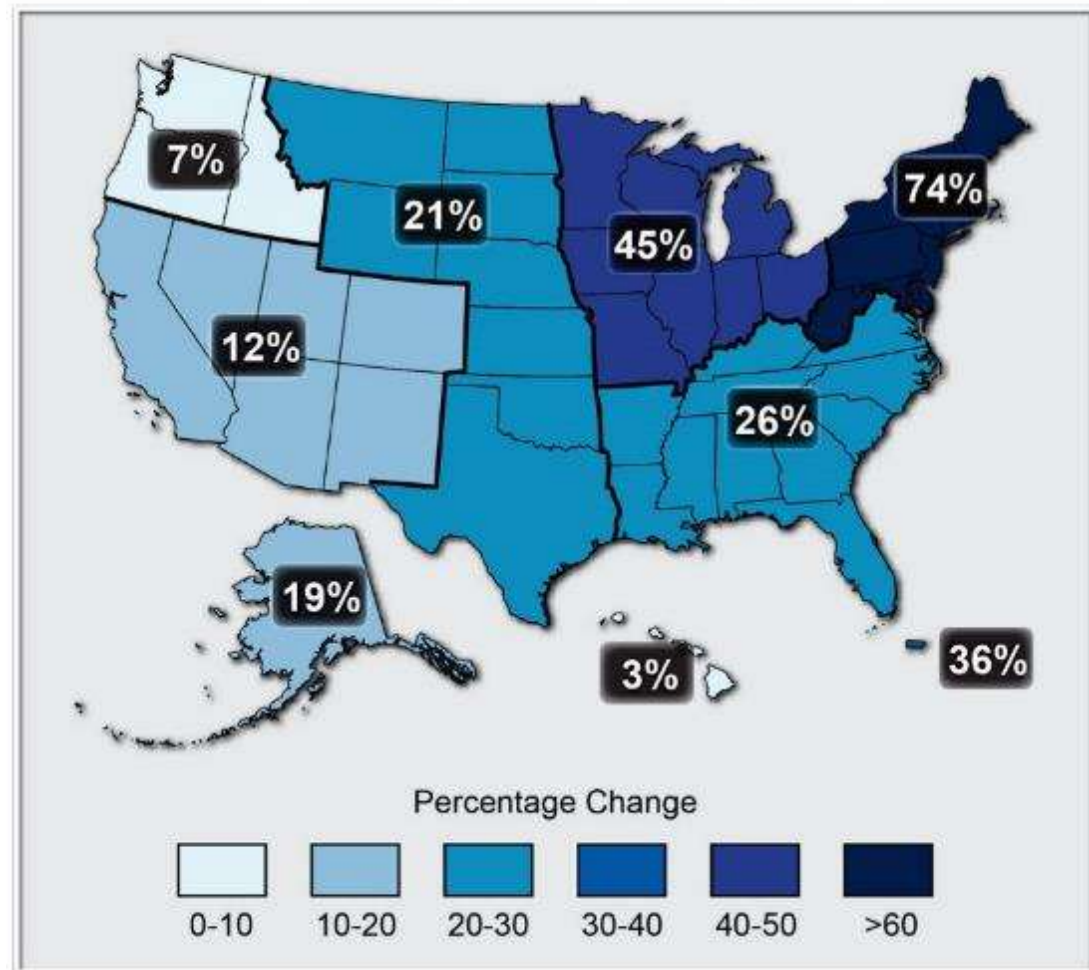
increased
precipitation

increased
stormwater

increased
flooding

infrastructure
damage

Percentage Change in Very Heavy Precipitation



It's getting hotter – especially in our cities

Northeast

Projected Increases in the Number of Days over 90°F

Historical Climate



Lower Emissions (B1)

Higher Emissions (A2)

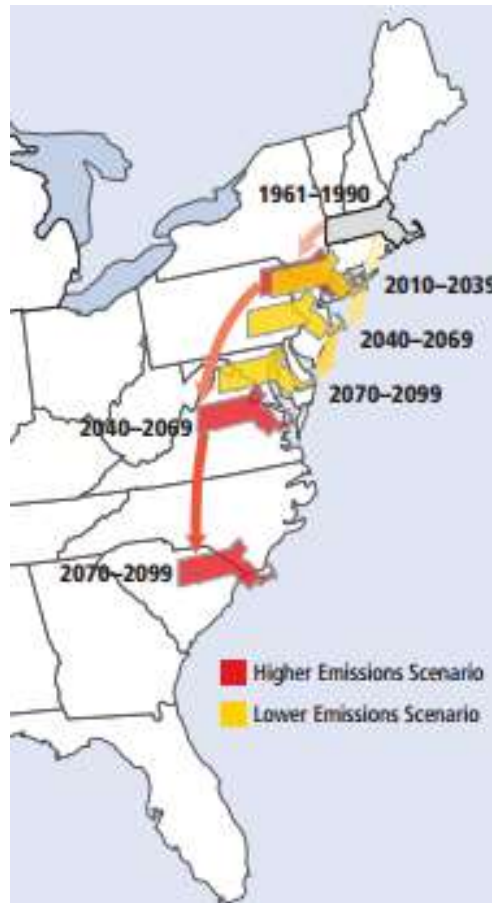


Number of Days



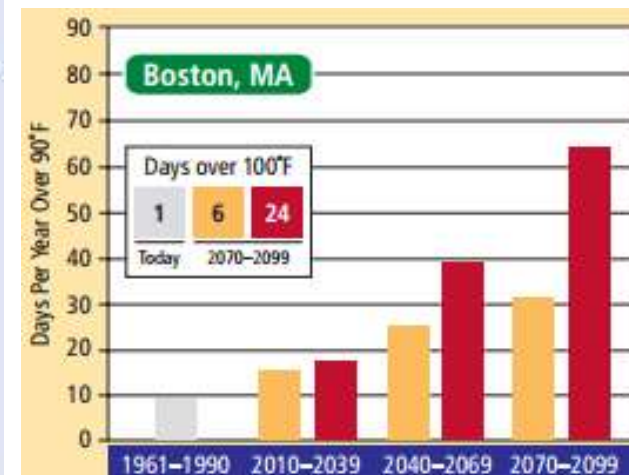
Source: Northeast National Climate Assessment,
NOAA

Massachusetts



Source: The Changing Northeast Climate,
Union Concerned Scientists

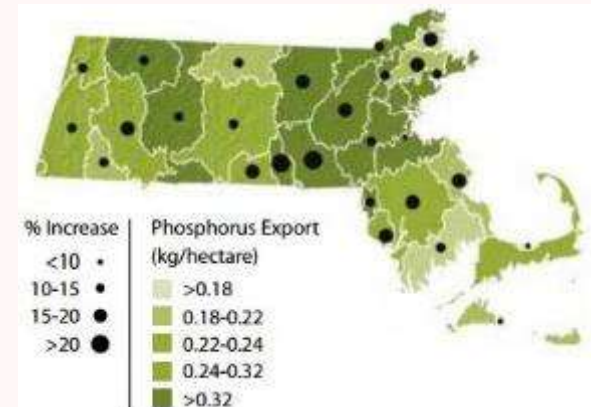
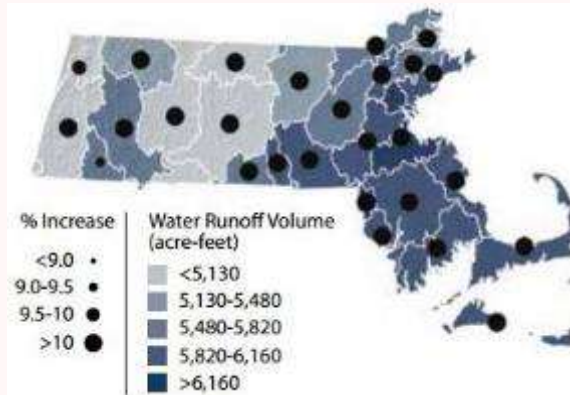
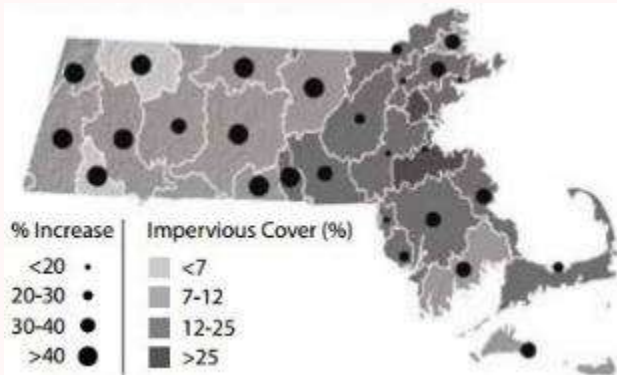
Boston: Urban heat island effect



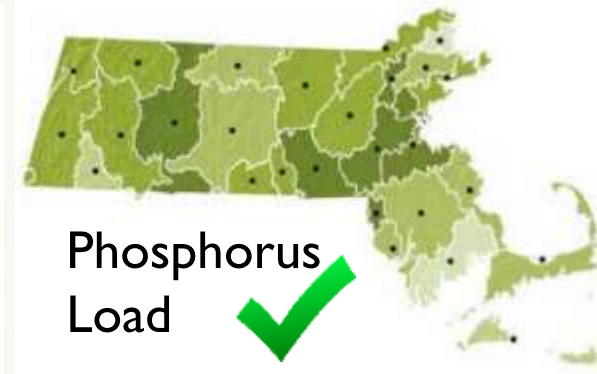
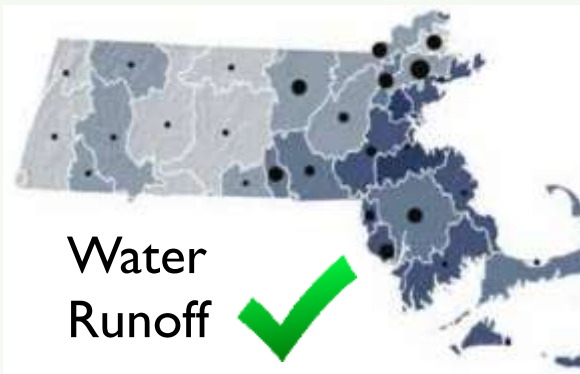
Source: The Changing Northeast Climate,
Union Concerned Scientists

We can change our priorities

If we continue to follow opportunistic growth, in 2060:



If we value forests as infrastructure, in 2060:



A different direction: Greening Your Community

Sustainable
development



Green
infrastructure
maintained



Improved
water quality

Improved
public safety

Reduced
energy use

Recreation
and habitat

Cost savings



Preserving MA Forests Mitigates Climate Change

- MA forests **sequester 14%** of the state's gross annual carbon emissions
- Average acre stores **85 tons carbon**
- Capacity **increases** over time as forests mature



They also provide free ecosystem services

- Shade
- Windblock
- Shelter
- Sponge
- Carbon
- Filter

MA forests provide over **\$3.8 billion** each year in free ecosystem services



Green Space = Resilience

The more **land we lose**
to sprawling development

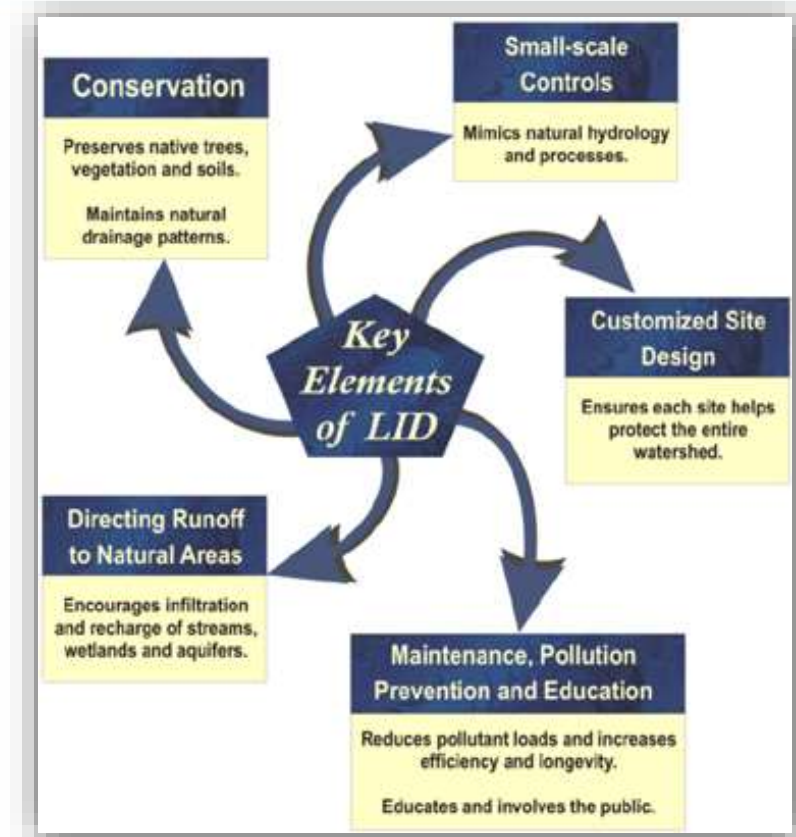


The more **resilience we lose**
in our communities

LID & GI



















“ LID is an approach to land development (or re-development) that **works with nature...** LID employs principles such as **preserving and recreating natural landscape features** and minimizing effective imperviousness...”

- EPA



Source: Whole Buildings Design Guide

Techniques and 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

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

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 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

© Environmental Services, City of Portland Oregon



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



Sustainable Development = Cost Savings

- A 20-unit development with two-acre lots requires 40 acres to be cleared and graded.
- Conservation subdivisions that preserve 50% of land save \$200,000-300,000, while maintaining the same amount of development.



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

Climate change is multi-faceted



massadapt.org

We need a **comprehensive climate
resiliency plan**

Take Home Messages

We can't continue on our current, business as usual path.

- Regional **development is sprawling** and issues are exacerbated by climate change
 - **Conserving** forests and floodplains is the first line of defense
 - LID & GI are **mimic nature** and benefit people and nature
 - Climate change is a complicated issue and requires a **comprehensive approach**

A scenic photograph of a calm lake, possibly a reservoir, framed by several large, dark tree trunks in the foreground. The water reflects the sky and the surrounding greenery. In the distance, a small white house with a brown roof is visible on the far shore, nestled among more trees. The sky is blue with scattered white clouds. The overall atmosphere is peaceful and natural.

Thank you!