NATURE-BASED SOLUTIONS IN DEVENS:

How Devens supports Green Infrastructure and LID

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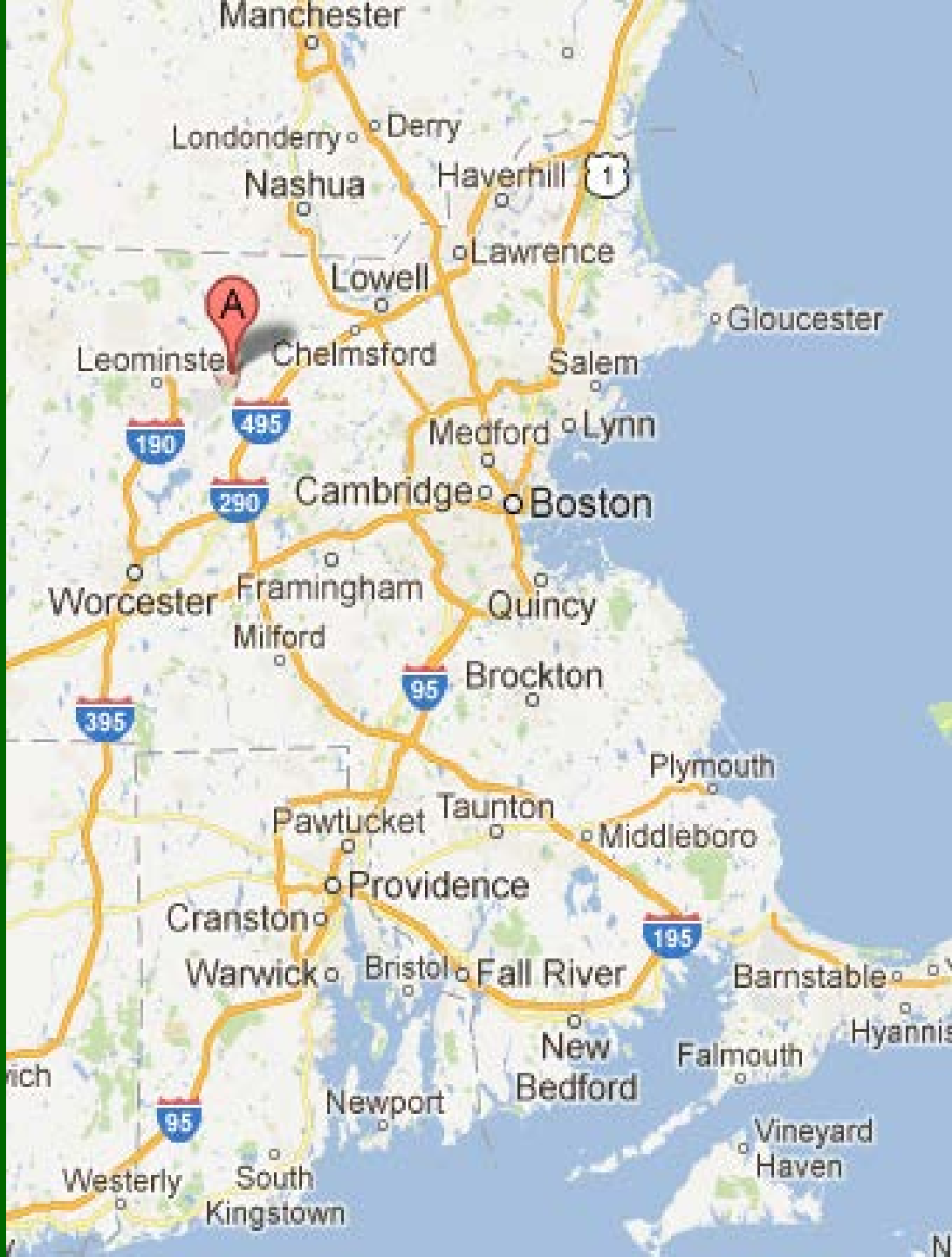
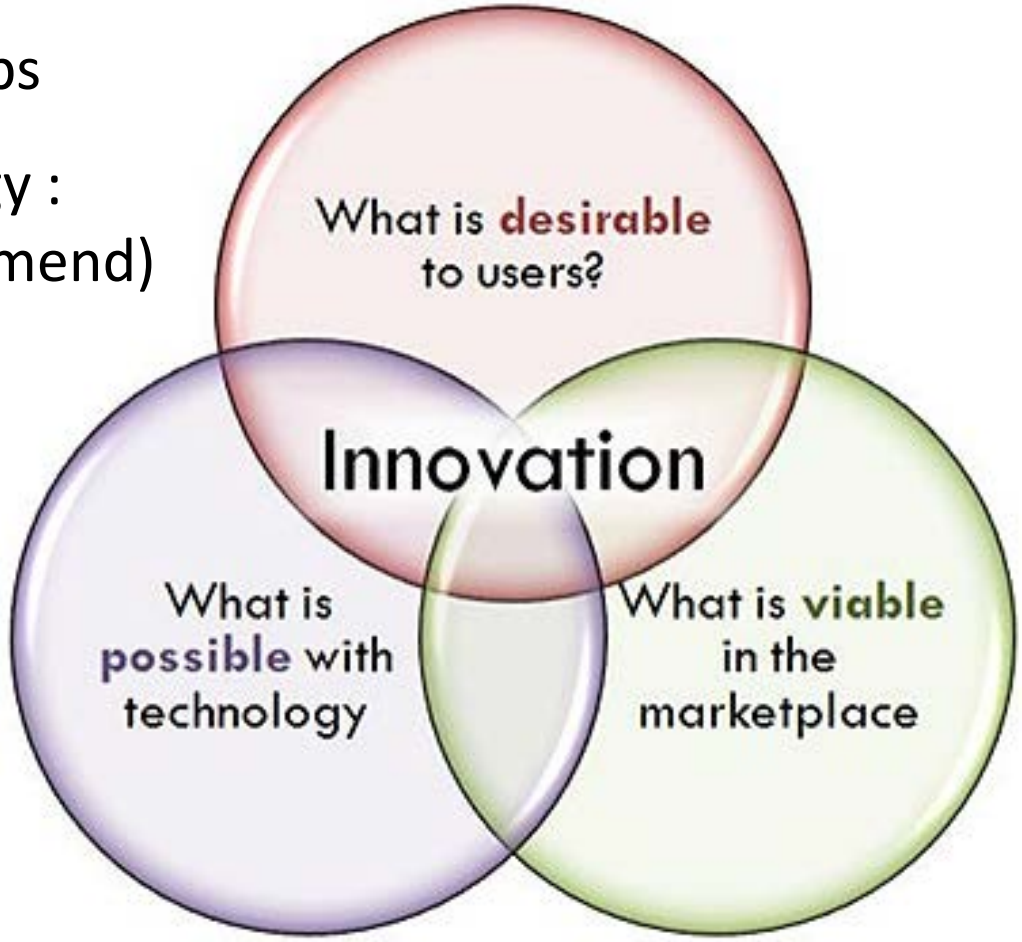
Devens Overview

- 35 miles outside Boston
- 4400 ac. former base
- Superfund Site
- 1993 Sustainable redev.
- LID as 1 tool to meet SD goal
- DEC – Regulatory Authority
- One-Stop Unified Permitting



How Devens has facilitated GI and LID?

- Strong leadership (local gov't)
- Communication/Partnerships
- Build on Progressive Strategy :
  - Regulations (audit/amend)
  - Guidelines
  - Education
  - Incentives

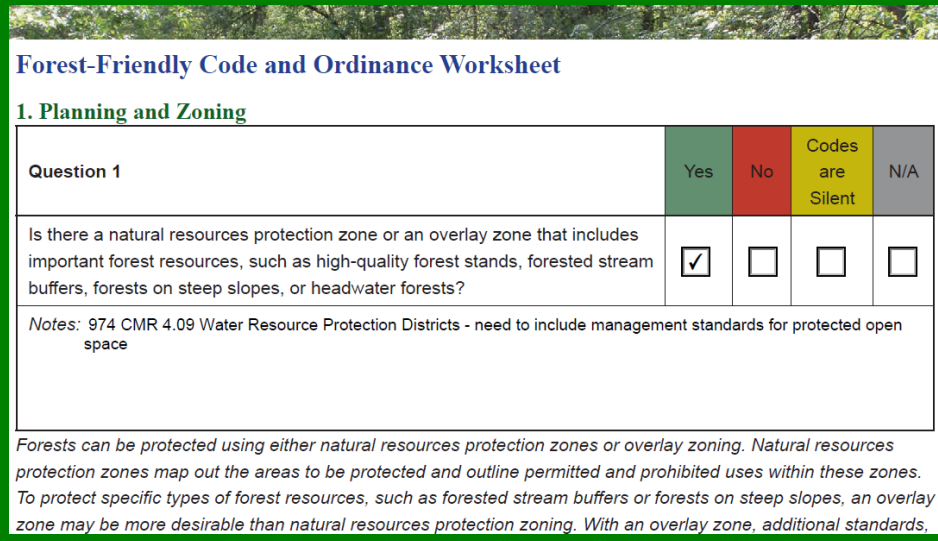


Regulation Audit Tools:

MassAudobon Nature-Based Solutions By-Law Review Toolkit

https://bit.ly/AudobonLID

Making Your Community Forest-Friendly: A Worksheet for Review of Municipal Codes and Ordinances - US Forest Service and Center for Watershed Protection



Forest-Friendly Code and Ordinance Worksheet

1. Planning and Zoning

Question 1	Yes	No	Codes are Silent	N/A
Is there a natural resources protection zone or an overlay zone that includes important forest resources, such as high-quality forest stands, forested stream buffers, forests on steep slopes, or headwater forests?	☑	☐	☐	☐

Notes: 974 CMR 4.09 Water Resource Protection Districts - need to include management standards for protected open space

Forests can be protected using either natural resources protection zones or overlay zoning. Natural resources protection zones map out the areas to be protected and outline permitted and prohibited uses within these zones. To protect specific types of forest resources, such as forested stream buffers or forests on steep slopes, an overlay zone may be more desirable than natural resources protection zoning. With an overlay zone, additional standards,

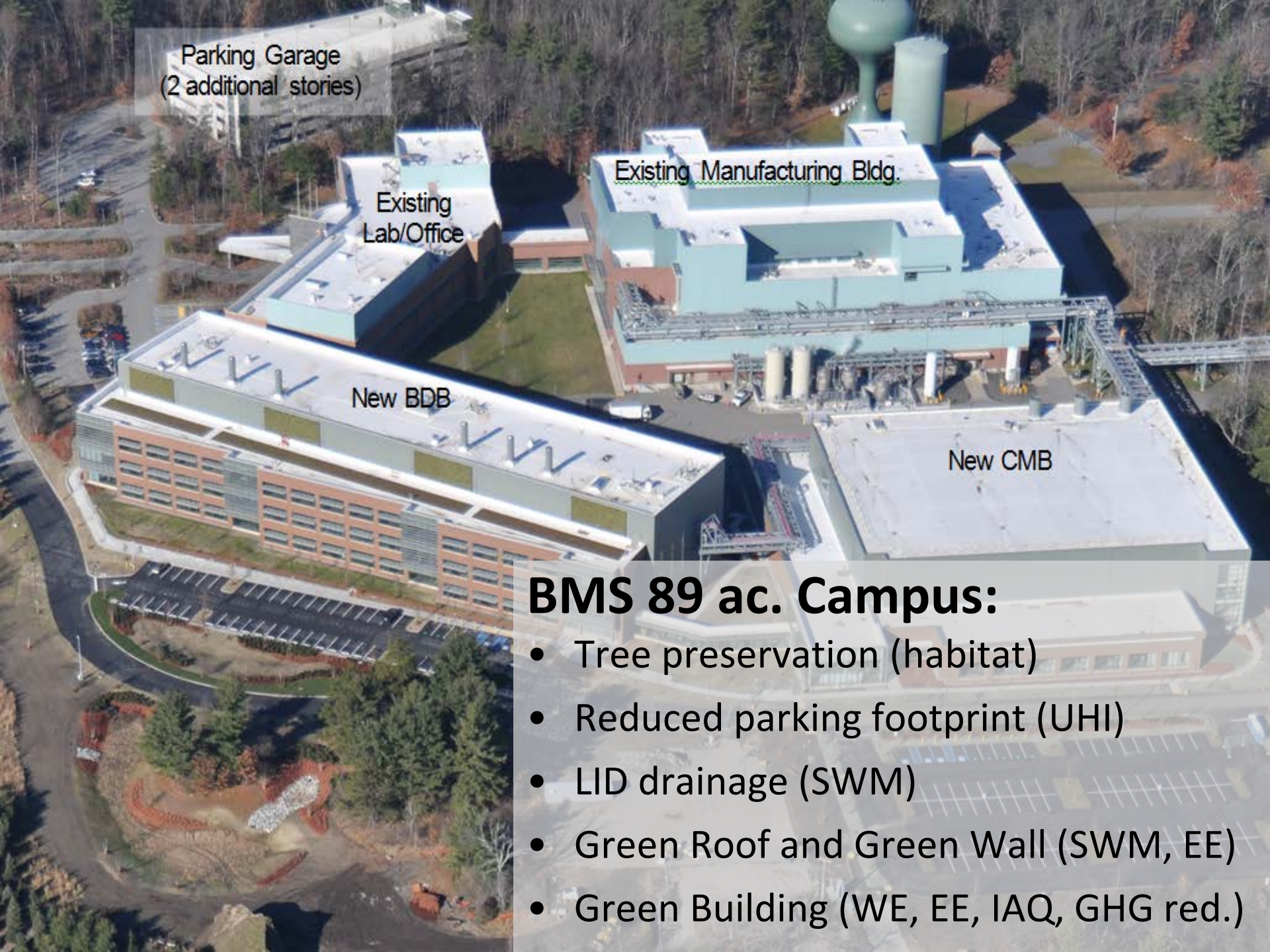
http://bit.ly/Forestfriendly

Regulating LID and GI:

Site Plan (974 CMR 3.04)

www.devensec.com/devserv.html

- Tree Preservation, Steep Slope Requirements
- Limit Construction Impact Zones/ Prohibit Clear-Cutting
- Penalty for removal of trees to be preserved
- Native Landscaping requirements
- Functional landscaping - reconnecting ecosystems
- Green Roof & Green Wall Regs
- Parking maximums



BMS 89 ac. Campus:

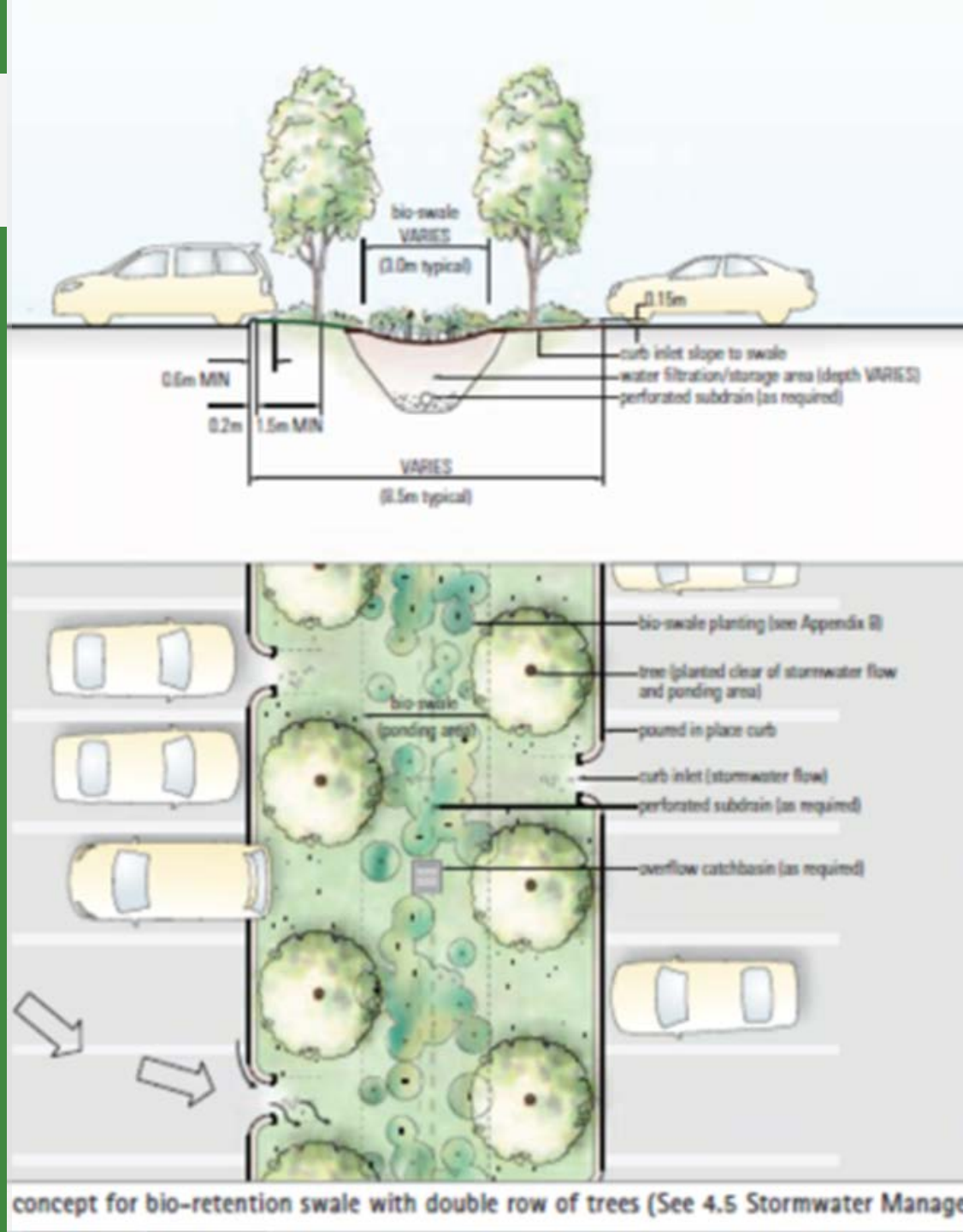
- Tree preservation (habitat)
- Reduced parking footprint (UHI)
- LID drainage (SWM)
- Green Roof and Green Wall (SWM, EE)
- Green Building (WE, EE, IAQ, GHG red.)

Regulating LID&GI:

Stormwater (974 CMR 4.08):

Replicate natural cond. (90% on-site):

- LID as a tool to meet infiltration requirements
- Decentralized systems (recharge/preserve land)
- Specifications for LID for guidance (make it easy!)
  - Veg roof
  - Permeable pavement
  - Reinforced turf, etc…
- MA DEP, UNH SW Center



Bio-filtration Landscape Islands: 27 Jackson Road

- MWCC 300+ spaces
- Proper design and construction key to durability

Regulating LID and GI:

Subdivision (974 CMR 2.07)

www.devensec.com/devserv.html

- Cluster subdivision – 5,000 sf lots, min. setbacks
- Complete Streets Standards (street trees, LID drainage, reduced pavement widths, ped scale design)
- Additional street types – more green, less grey)

New Grant Road Neighborhood Redevelopment

- Rear Lane/Service Roads 12’ paved
- Emergency access maintained using LID (worked with Fire Dept.)
- Reduced UHI, SWM, $avings

Regulating LID and GI:

Rainwater Harvesting (974 CMR 4.00 & 8.00)

- Required for comm/ind. irrigation
- Inexpensive supply of water
- Preserves drinking water supplies
- Requires little treatment for non-potable reuse ($$) (toilet flushing/irrigation)
- Reduces SW runoff, NPS pollution & erosion
- Reduces peak summer demand
- Easy to install/screen
- Plan early in design

Rainwater Harvesting: Little Leaf Farms

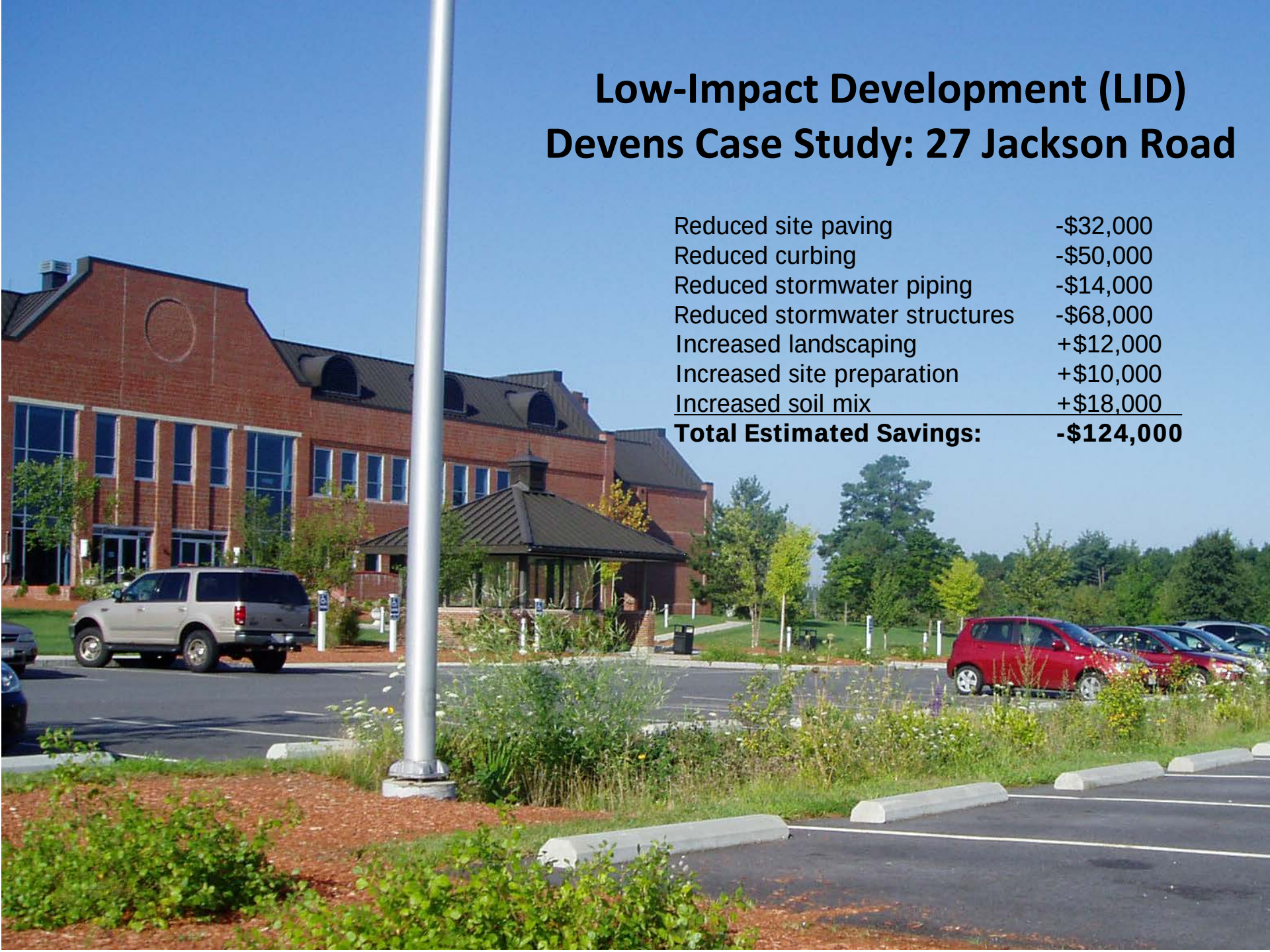
- ~450,000 sq.ft. greenhouse
- Hydroponic baby green lettuce production
- Rainwater harvesting (80% of water demand)
- Automated process, pesticide-free
- Locally sourced/farm to table same day.
- Pollinator plantings – natural pest control, SWM

How did we get support for these regulations?

Education, Awareness, and Guidance:

Seeing is Believing!

Low-Impact Development (LID)
Devens Case Study: 27 Jackson Road



Reduced site paving	-$32,000
Reduced curbing	-$50,000
Reduced stormwater piping	-$14,000
Reduced stormwater structures	-$68,000
Increased landscaping	+$12,000
Increased site preparation	+$10,000
Increased soil mix	+$18,000
Total Estimated Savings:	**-$124,000**

LID Peer to Peer: 155 Jackson Road

- 70+ spaces
- Connected developer with DPW & other developers on “how to’s” for construction and O&M

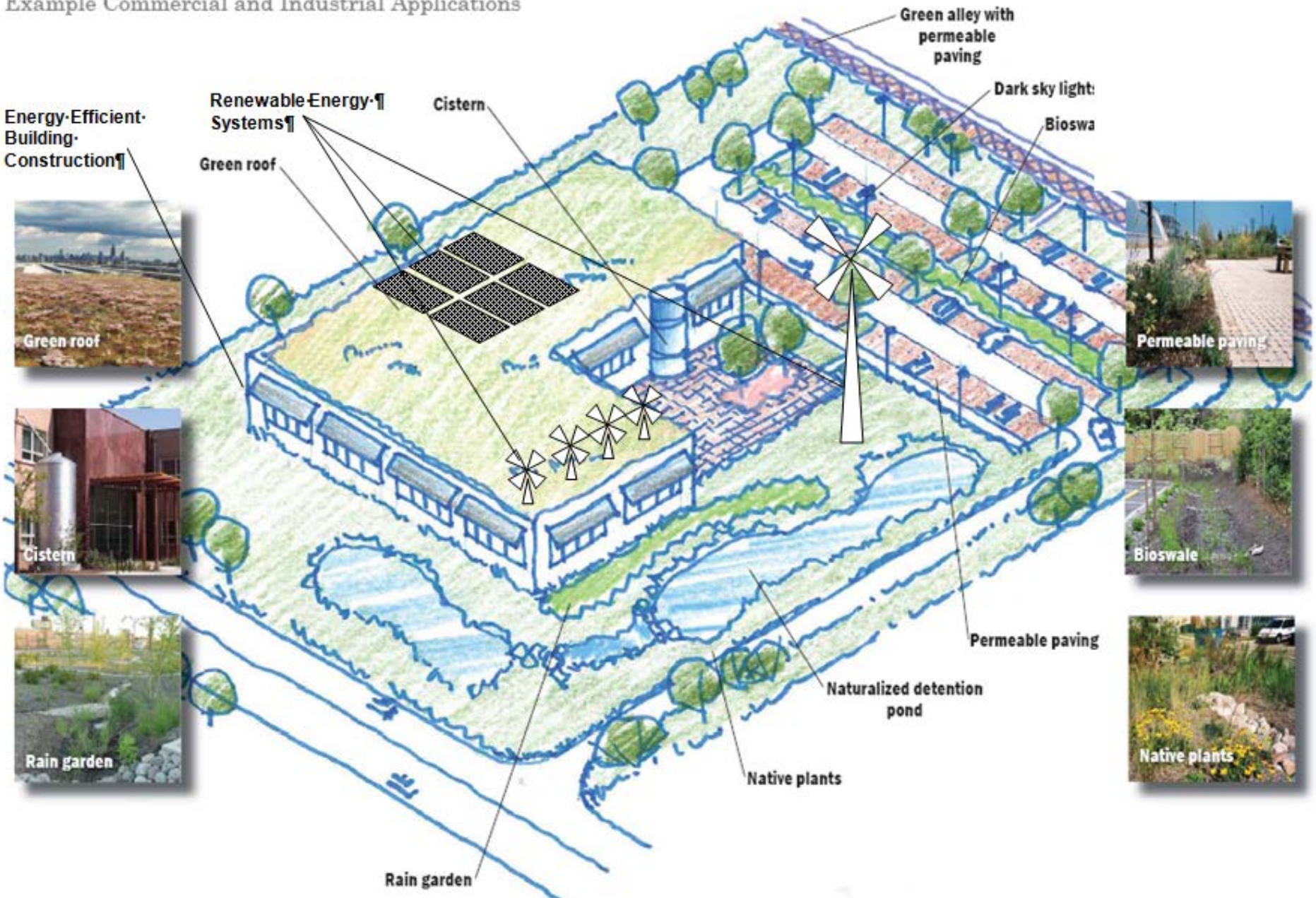
Example Residential Lot Level LID strategies:

- No gutters
- Pervious walkways
- Rain gardens
- Reduced lawn areas (cluster sub.)
- Street trees
- GI & UHI reduction

Guidelines:

Example Commercial and Industrial Applications

Make it even easier to do the right thing!
http://www.devensec.com/planning-docs.html



Promoting LID as a climate adaptation/resiliency strategy:

- Flexibility/durability for changing conditions
- Local GW recharge/decentralized systems
- Reduced flooding
- UHI mitigation (better AQ &WQ)
- GHG reduction

Incentivizing LID in Devens

- Cheaper upfront infrastructure costs offsetting long-term maintenance cost – case studies
- Not out of sight, out of mind – cheaper to fix problems
- Exponential value vs. Grey Infrastructure that depreciates
- SWM credit green roofs
- GB Incentive Program: LEED® certification = 15% feebate

Collaboration is Key to Build Support!

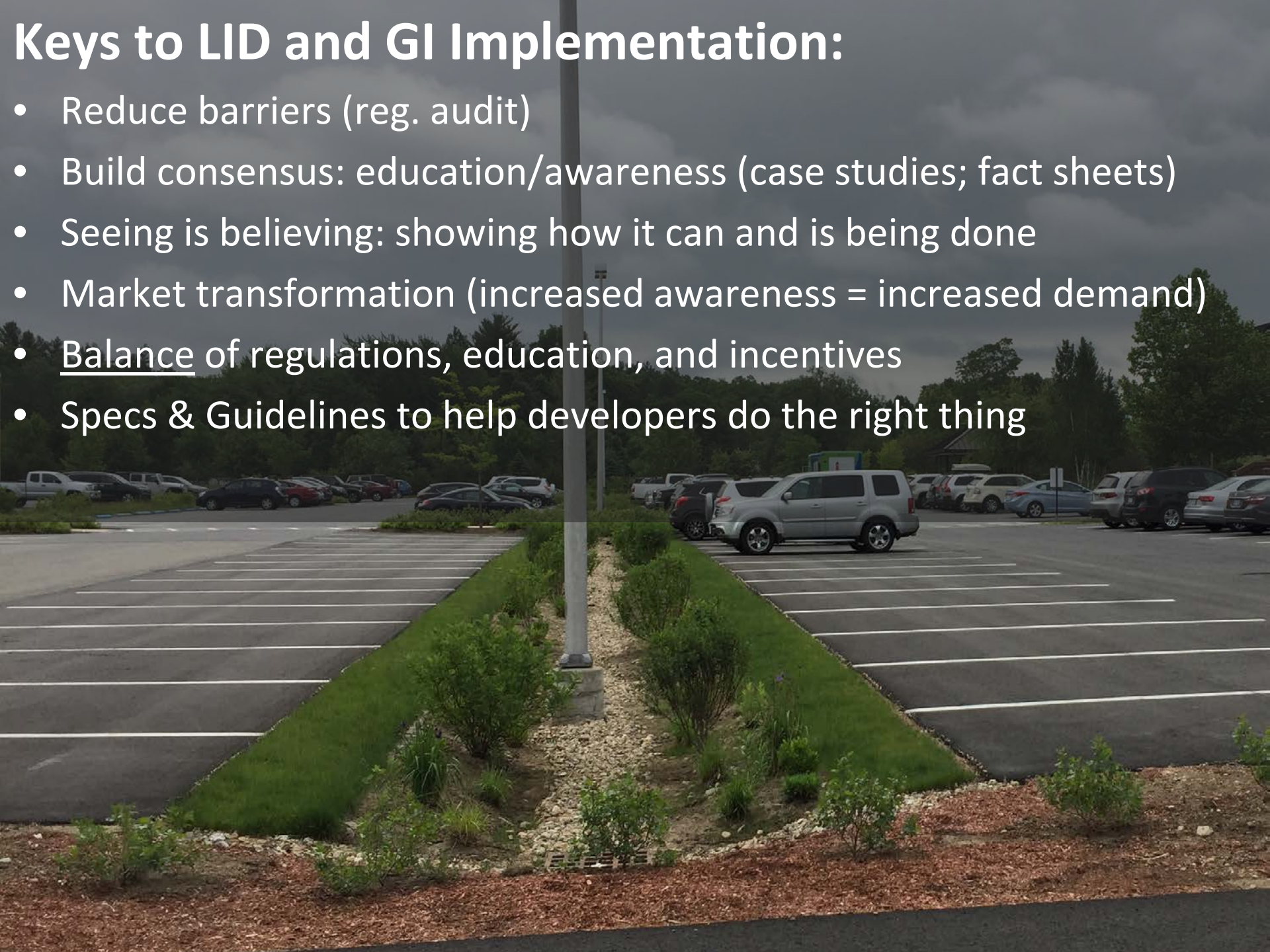
- Partnership with Public Works:
  - Green Infrastructure benefits vs Grey infrastructure

    Maintenance, extended pavement life, decreased flood damage, exponential increase in value vs. grey (depreciates)

- Collaborate with Commissions:
  - ID shared interests: efficient LU, public health, SWM, wetland protection, climate change – PZC, BOH, CC, Eco. Dev.

Keys to LID and GI Implementation:

- Reduce barriers (reg. audit)
- Build consensus: education/awareness (case studies; fact sheets)
- Seeing is believing: showing how it can and is being done
- Market transformation (increased awareness = increased demand)
- Balance of regulations, education, and incentives
- Specs & Guidelines to help developers do the right thing



Thanks!
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