2ND ANNUAL
CAPE COASTAL
CONFERENCE

JUNE 5, 2014

Linking Science with Local Solutions and Decision-Making

Green Stormwater Infrastructure in New England – A Current Assessment.

Rich Claytor

Today's Agenda

- Quick fundamentals of stormwater management
- The evolution of stormwater management towards Low Impact Development(LID)/green infrastructure
- A couple of example of projects/practices from Southeastern MA, and Providence, RI

Stormwater basics

At ~10% impervious we begin to see:

- Water quality issues
- Impacts to biological communities
- Increased flooding
- Stream erosion
- Loss of recreational uses
- Shellfish bed closures
- Reduced baseflow and recharge

Low Impact Development (LID)

Traditional

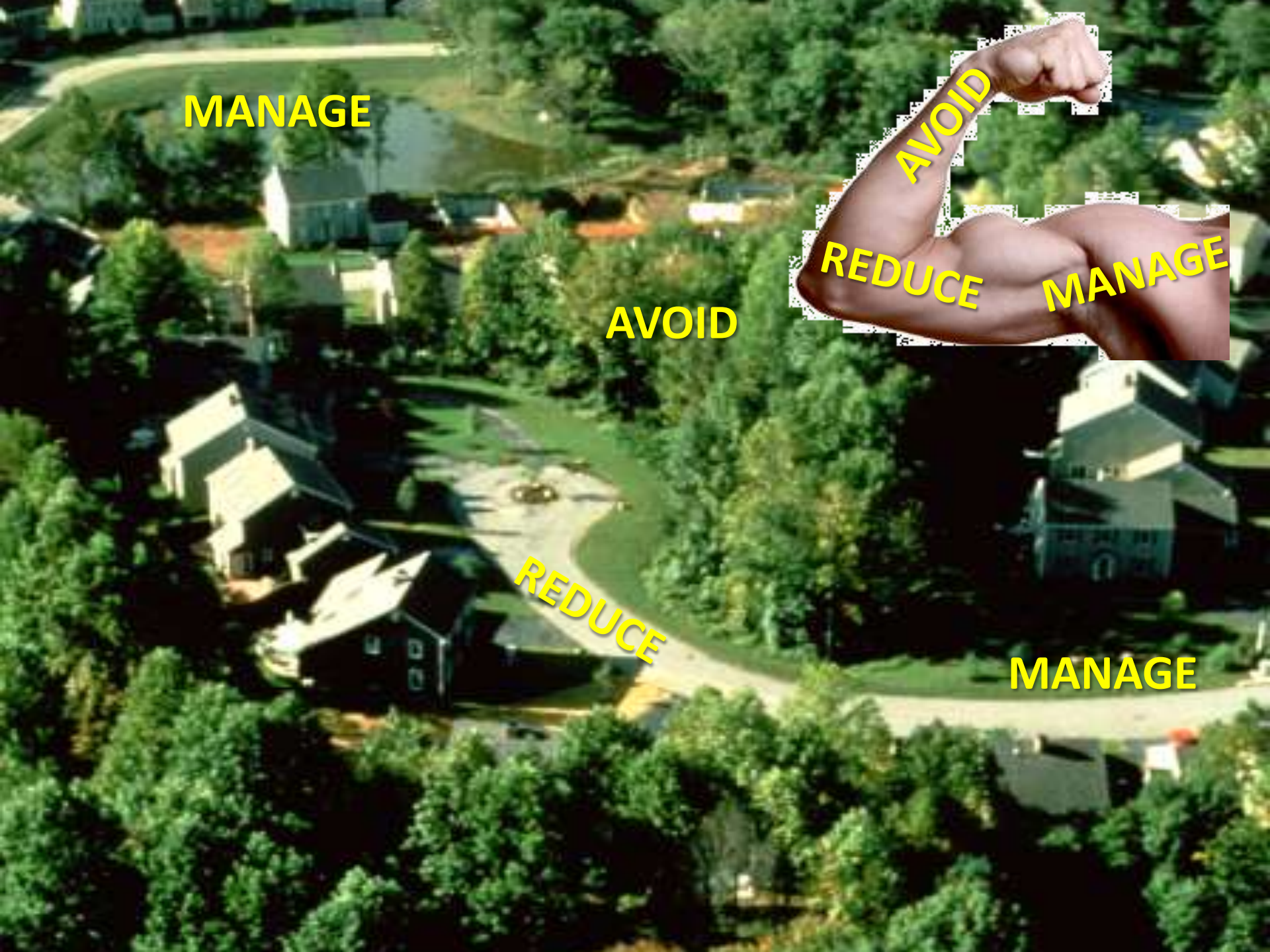
LID

Site Design

BMPs

LID Site Planning and Design Approach

Objective - to provide a process by which LID is considered at an early stage in the planning process to prevent stormwater impacts rather than mitigate them.


MANAGE
AVOID
REDUCE
MANAGE
AVOID
REDUCE
MANAGE

Low Impact Development (LID)

Community Planning

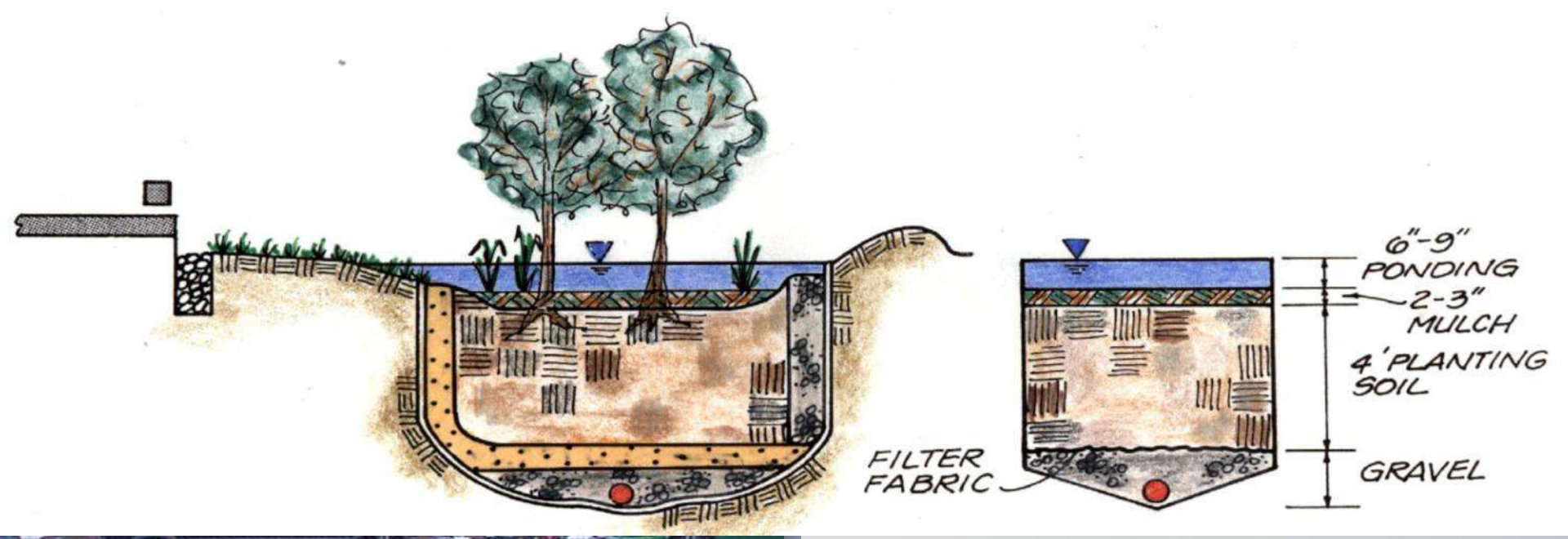
LID Site Design

LID BMPs

Large Conventional BMPs

Receiving Waters

LID Practice Library: *Bioretention*


6"-9"
PONDING
2-3"
MULCH
4' PLANTING
SOIL
FILTER
FABRIC
GRAVEL

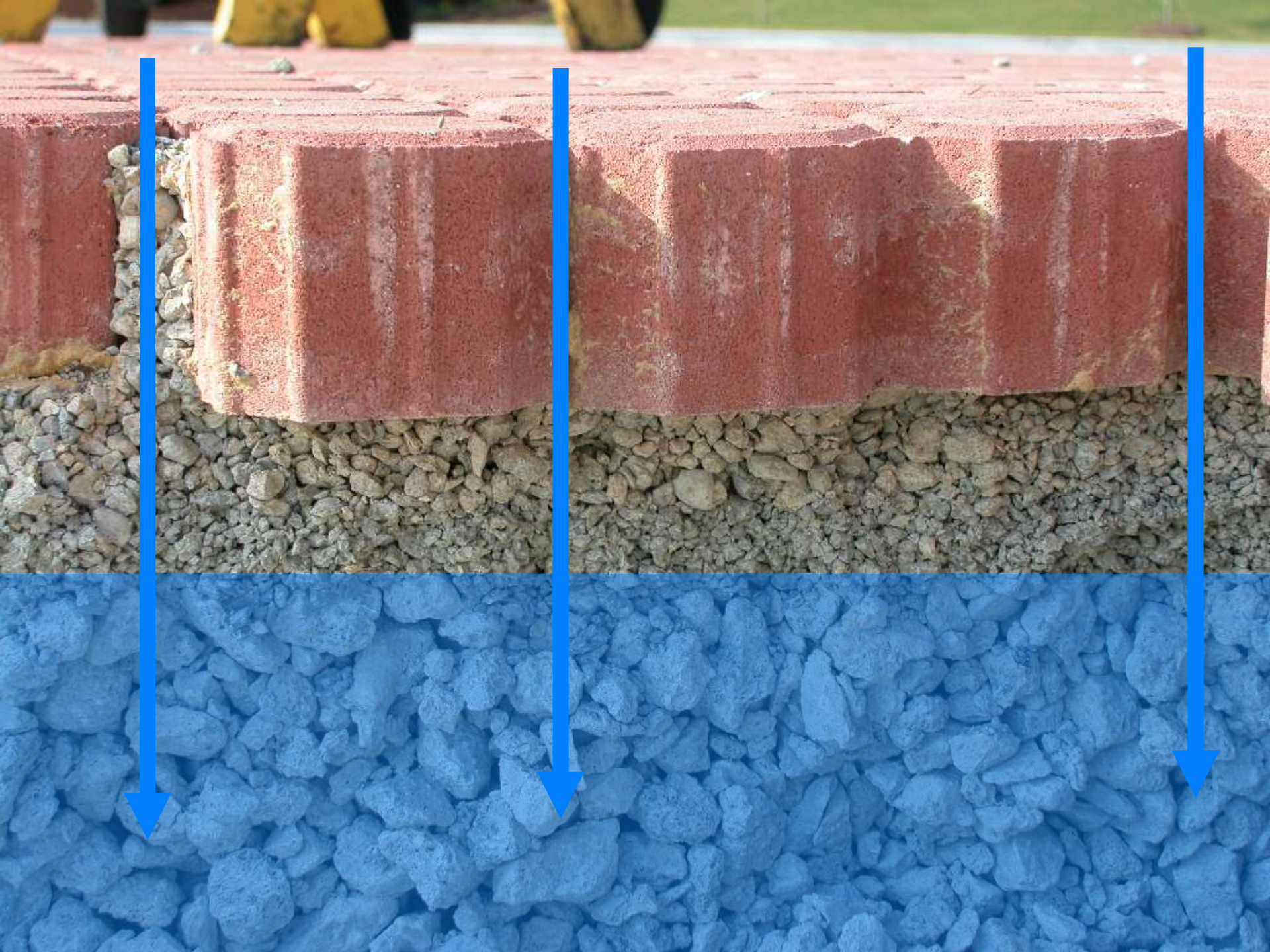
LID Practice Library: *Bioretention*

LID/GI Practice Library: *Rain gardens*

LID Practice Library: *Planters*

LID Practice Library: *Tree pits*

LID Practice Library: *Porous Pavement*

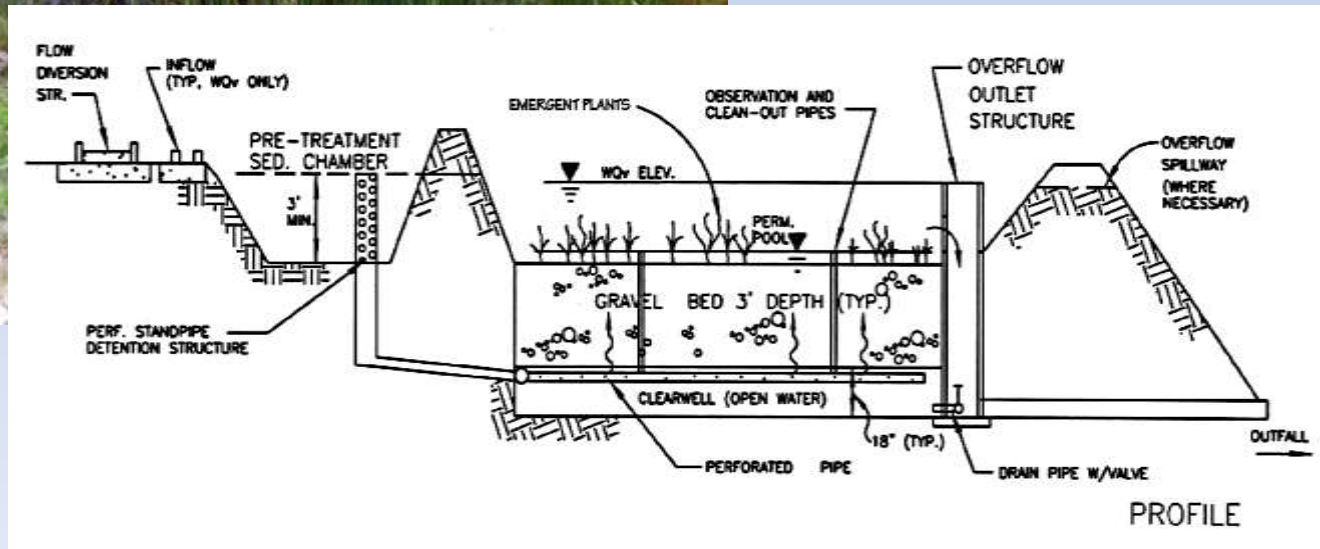


LID Practice Library: *Infiltration*

LID Practice Library: *Infiltration*

LID Practice Library: *Green/blue roofs*

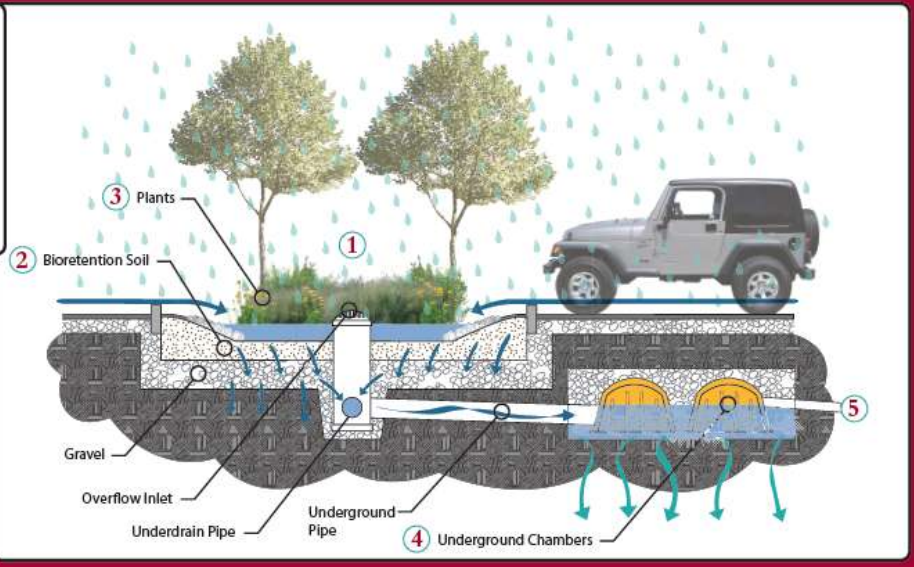
LID/GI Practice Library: *Gravel wetlands*

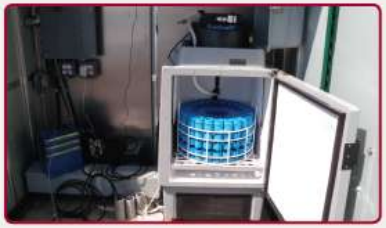


Bridgewater State University
Green Parking Lot & GI Monitoring

West Campus Lot is Different. Innovative. Green.

The West Campus Lot is equipped with a stormwater monitoring system to teach students about the combined science, technology and engineering at this site, and to help inform the policies that protect our nation's waters. Parking lots typically accumulate pollutants that are then washed off into nearby wetlands. They also typically short-circuit the natural water cycle by preventing water from recharging our underground aquifers. This parking lot is different.





A **stormwater monitoring system** integrated into the parking lot enables our students and faculty to investigate the quality and flow of rain water passing through this system. Monitoring takes place at the inflow and outflow locations of this bioretention area and the associated underground storage chamber.

1 The landscaped areas between the parking aisles in this parking lot are far more than a few patches of pretty plants! The plants and soils in these **bioretention areas** are working hard during every rain storm to filter pollutants out of the water that flows off the parking lot. Some of the water seeps into the ground below.

2 **Bioretention Soils** are designed to support the filtration of water and to provide a home for microorganisms that break down pollutants in the water.

3 **Plants** help to aerate the soil, improve filtration in the soil, absorb pollutants in the water, and transpire water back into the atmosphere. They are specially chosen to survive both drought and wet conditions.

4 The filtered water then flows via an underground pipe into a series of large stone-filled **chambers** hidden under the parking lot. These chambers collect and hold large volumes of stormwater that could otherwise contribute to flooding and severe erosion. Some water seeps out the bottom of the chambers into the soil below.

5 This infiltrated water helps to support the natural base flow in nearby wetlands and streams, and increases the availability of groundwater in aquifers that provide drinking water. Water is also slowly released via pipes to the wetlands beyond the railroad tracks, and eventually flows to the **Taunton River.**

photo: Daniel Bennette

Acknowledgement: This stormwater management project was initiated as a pilot project of the Taunton River Watershed Management Plan, with funding from the Commonwealth of Massachusetts through Bridgewater State University.

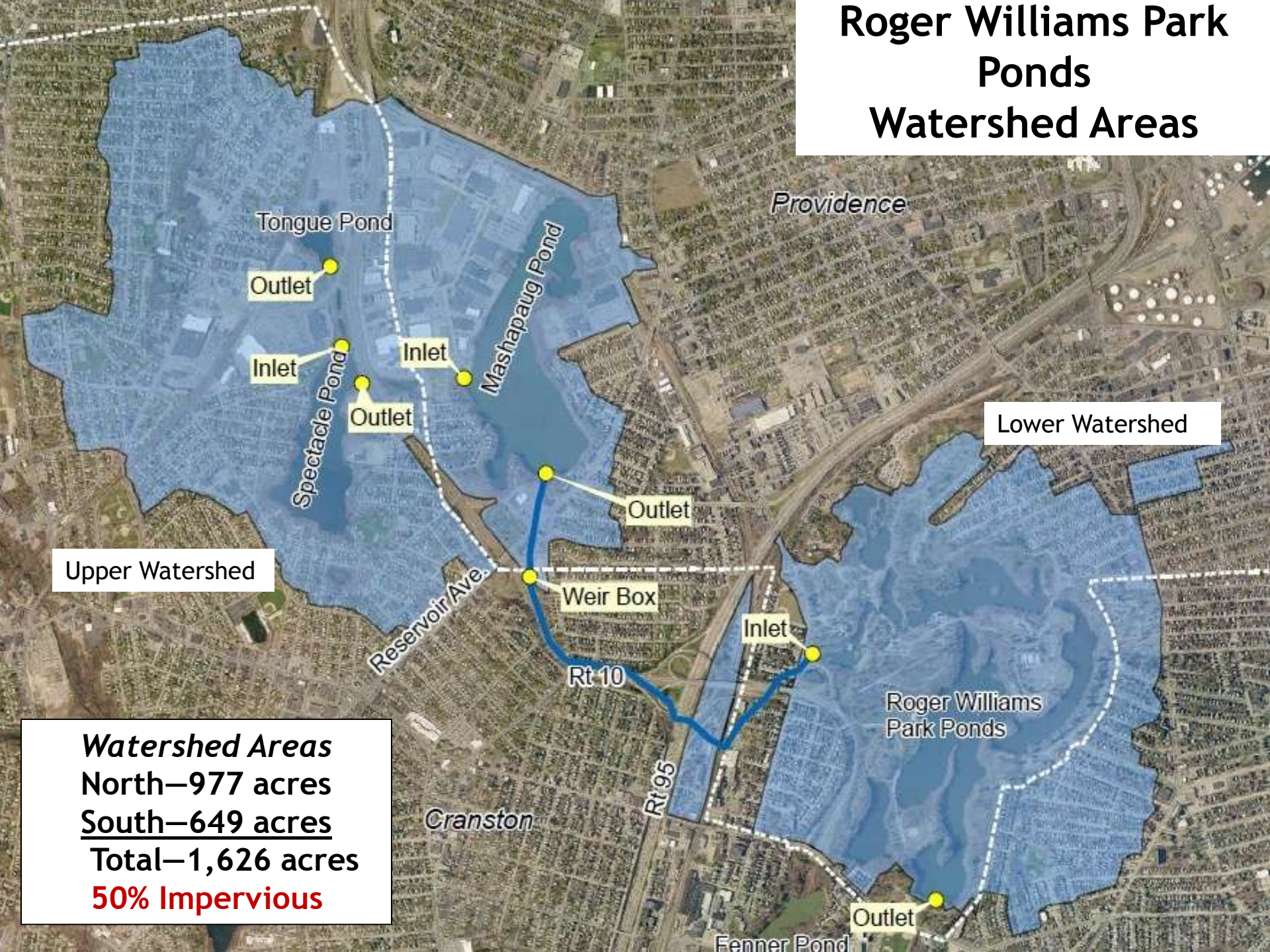
Horsley Witten Group
Sustainable Environmental Solutions

BRIDGEWATER STATE UNIVERSITY

The Nature Conservancy
Protecting nature. Preserving life.

Example of interpretative signage for HW's green infrastructure design and monitoring project at Bridgewater State University

Roger Williams Park Ponds Watershed Areas



Watershed Areas

North—977 acres

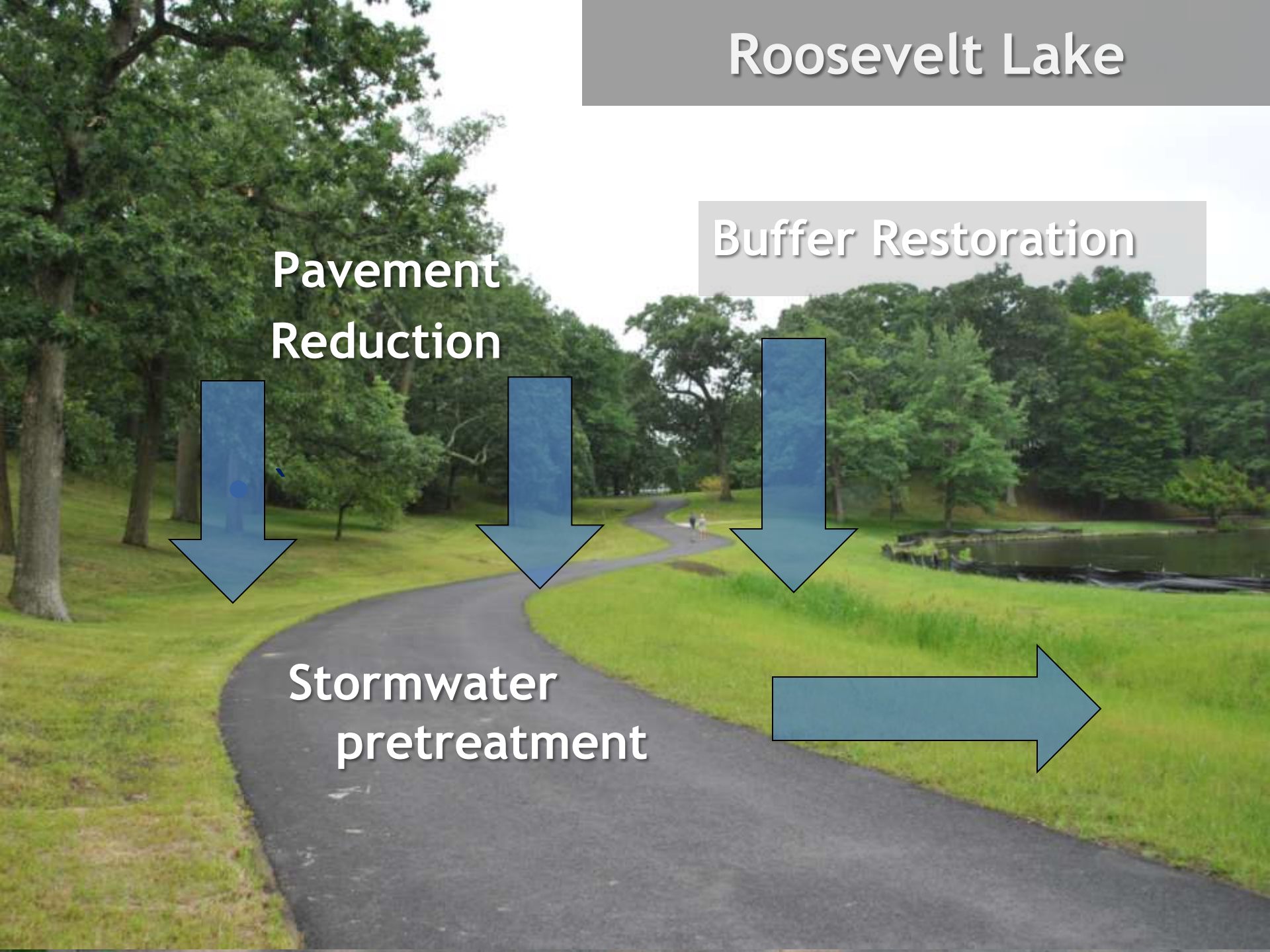
South—649 acres

Total—1,626 acres

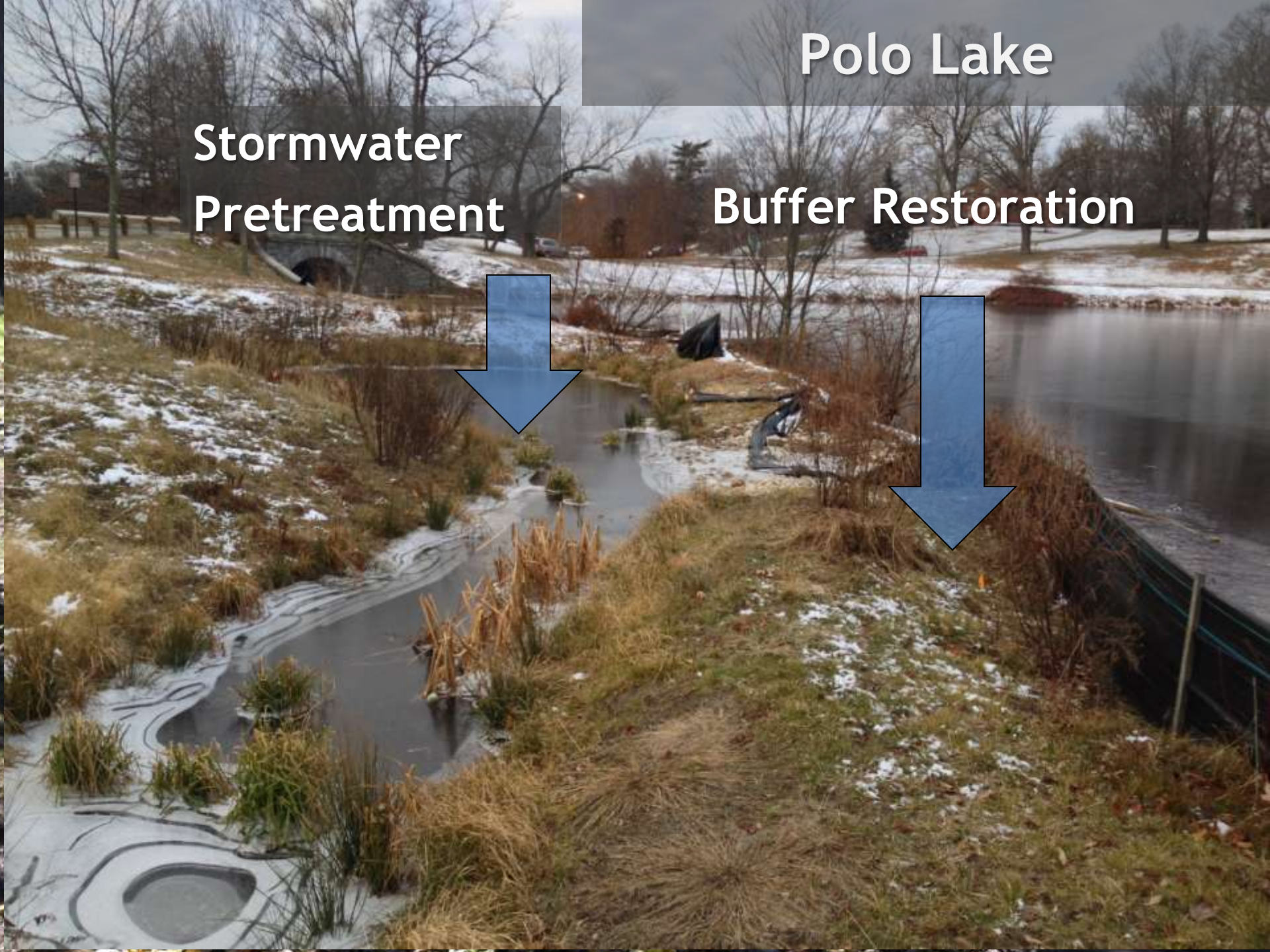
50% Impervious

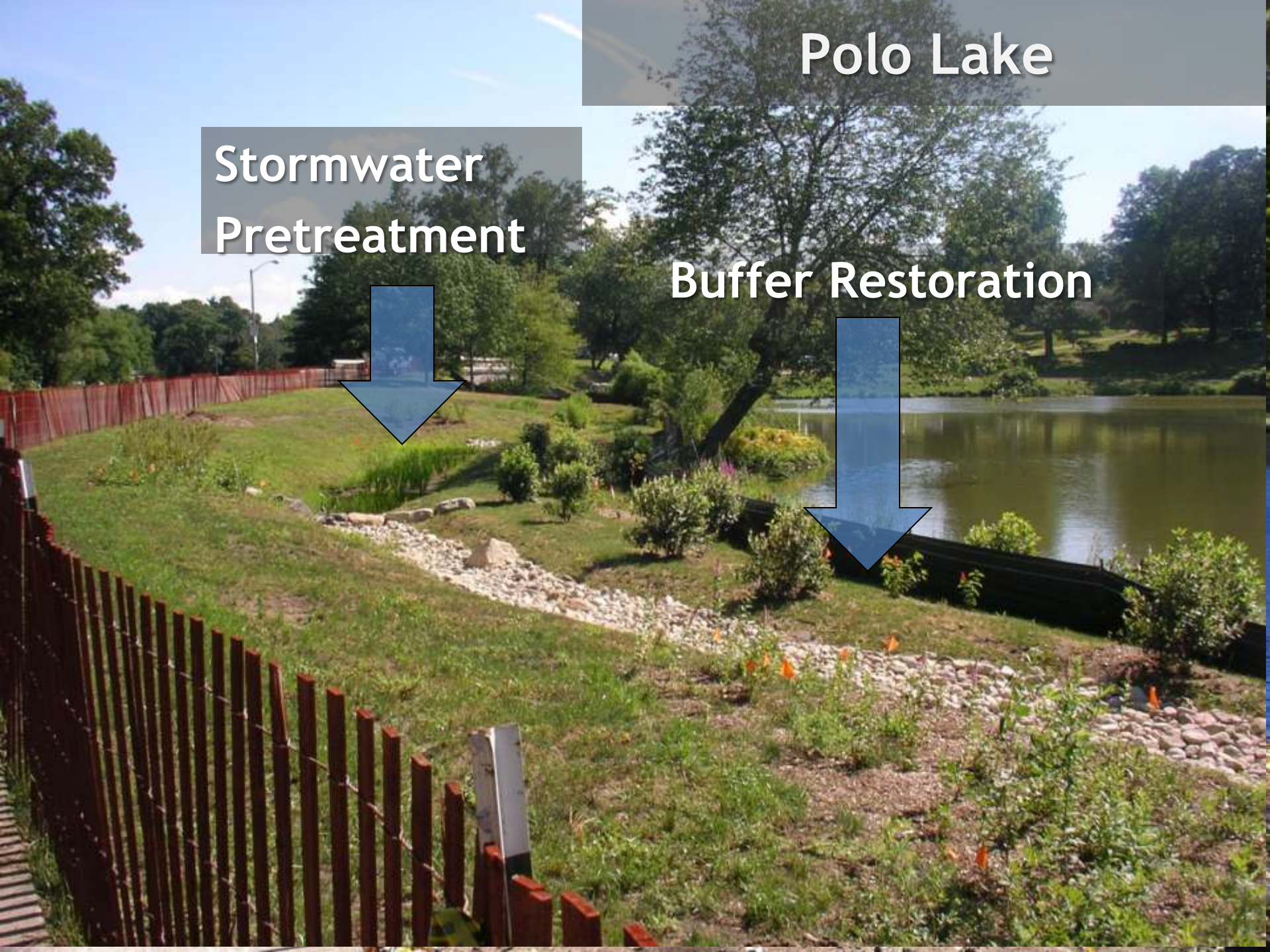
Bioretention Installation and Training Workshop

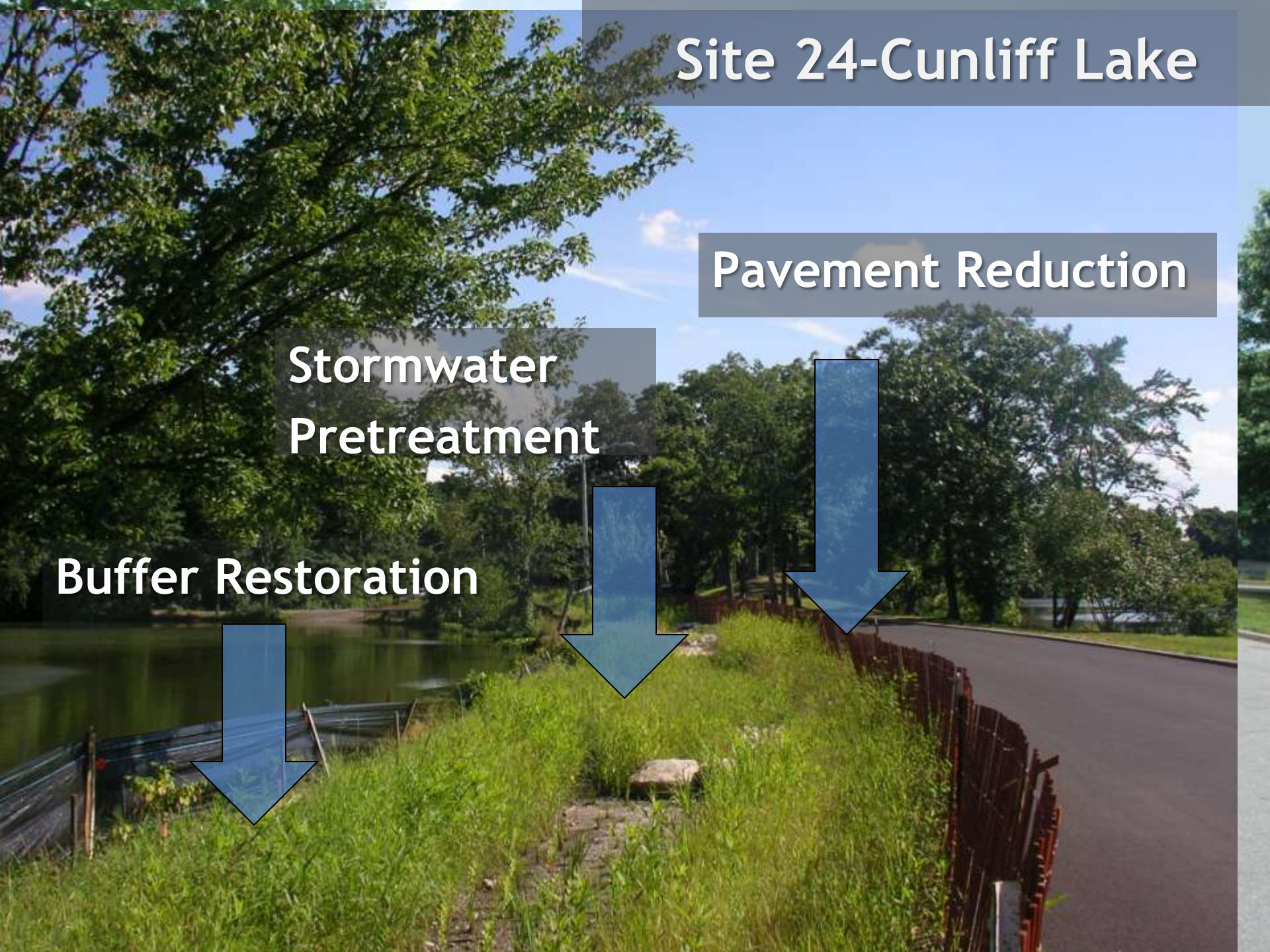
Willow Lake


Roosevelt Lake
Buffer Restoration
Pavement Reduction
Stormwater pretreatment


Roosevelt Lake
Stormwater pretreatment
Pavement Reduction
Buffer Restoration


Polo Lake
Stormwater Pretreatment
Buffer Restoration


Polo Lake
Stormwater Pretreatment
Buffer Restoration


Site 24-Cunliff Lake
Pavement Reduction
Stormwater Pretreatment
Buffer Restoration

Site 24-Cunliff Lake


Questions?