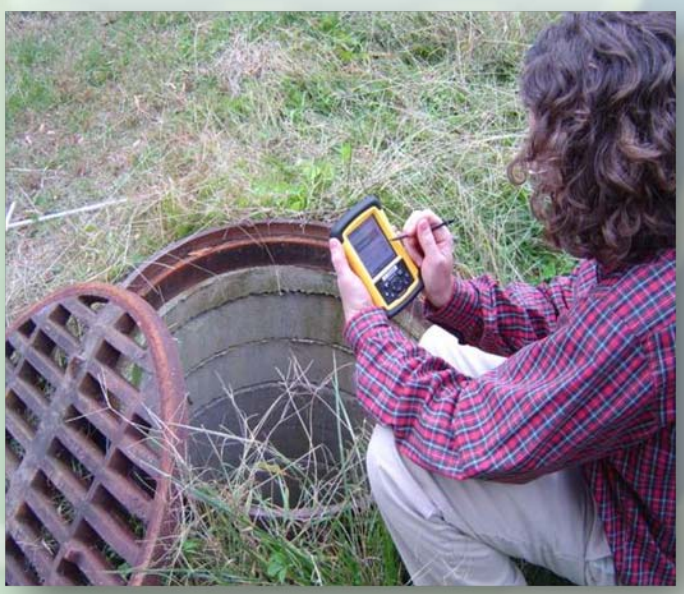
# EPA Region 1 MS4 Stormwater General Permits and LID Training Clinic



Track A: Planning & Budget

**Funding Stormwater Programs**

Dean College

Franklin, MA

June 3, 2011

Horsley Witten Group, Inc.

# Drivers of a Sustainable Stormwater Funding Source

- Flooding;
- Aging/failing infrastructure;
- Development pressures;
- Water/environmental quality;
- Regulatory Mandates
- Quality of Life;
- Property values;
- Drinking water protection/replenishment;
- Recreation (fishing, boating, swimming);
- Erosion of stream/creeks;
- Lawsuits

# Three Funding Truths

*(and one strongly held opinion)*

- It is cheaper to protect than to restore;
- Taking action today is cheaper than taking action tomorrow;
- There is not, has never been, and never will be enough grants - public or private - to fund water resources protection and restoration;
- *Local problems require local solutions*

"Courtesy Dan Nees Environmental Finance Center
University of Maryland"

# So, What's the Problem?


# Stormwater Management is Complex

- Multiple regulations:
  - MS4 - Zoning
  - RDA - Subdivision
  - TMDL - WPA
  - CSO
- And regulators:
  - Federal
  - State
  - Local

## City's Stormwater Regulations May Be In For Rough Weather

By MICHAEL FINN
*Free Press Staff Writer*

NASHVILLE — Another storm may be brewing over the city's compliance with federal and state stormwater regulations.

State Rep. Brenda Turner wants Chattanooga city officials to explain why they haven't complied with some provisions of the state law on stormwater fees that the Legislature passed two years ago.

She said she's also concerned about some of the "heavy-handed" tactics that Chattanooga is using to collect the fee from citizens

al report for the Legislature on actions it is taking pertaining to the stormwater fee and its efforts to comply with the federal Clean Water Act that mandated action from cities with a population of 100,000 or more.

The provision requiring cities to report was added to the state law through an amendment sponsored by Rep. Turner.

The city is supposed to make an annual report to the federal government on its stormwater compliance, said Rep. Turner, adding, "It would not be an additional burden to the city to give the Legislature the same report that they

"On the tax notice the city tries to say that Congress mandated that tax," Rep. Turner said. "But Congress enacted the Clean Water Act. It was the city that placed a tax burden on its citizens and businesses to do what city officials thought was needed to do to clean up the water.

"People are confused about who did what.

"The city wants to say that Congress placed a tax on them. But they (Congress) didn't. It was the city that established the rate. It was the city that chose to put it on property tax bills," Rep. Turner said.

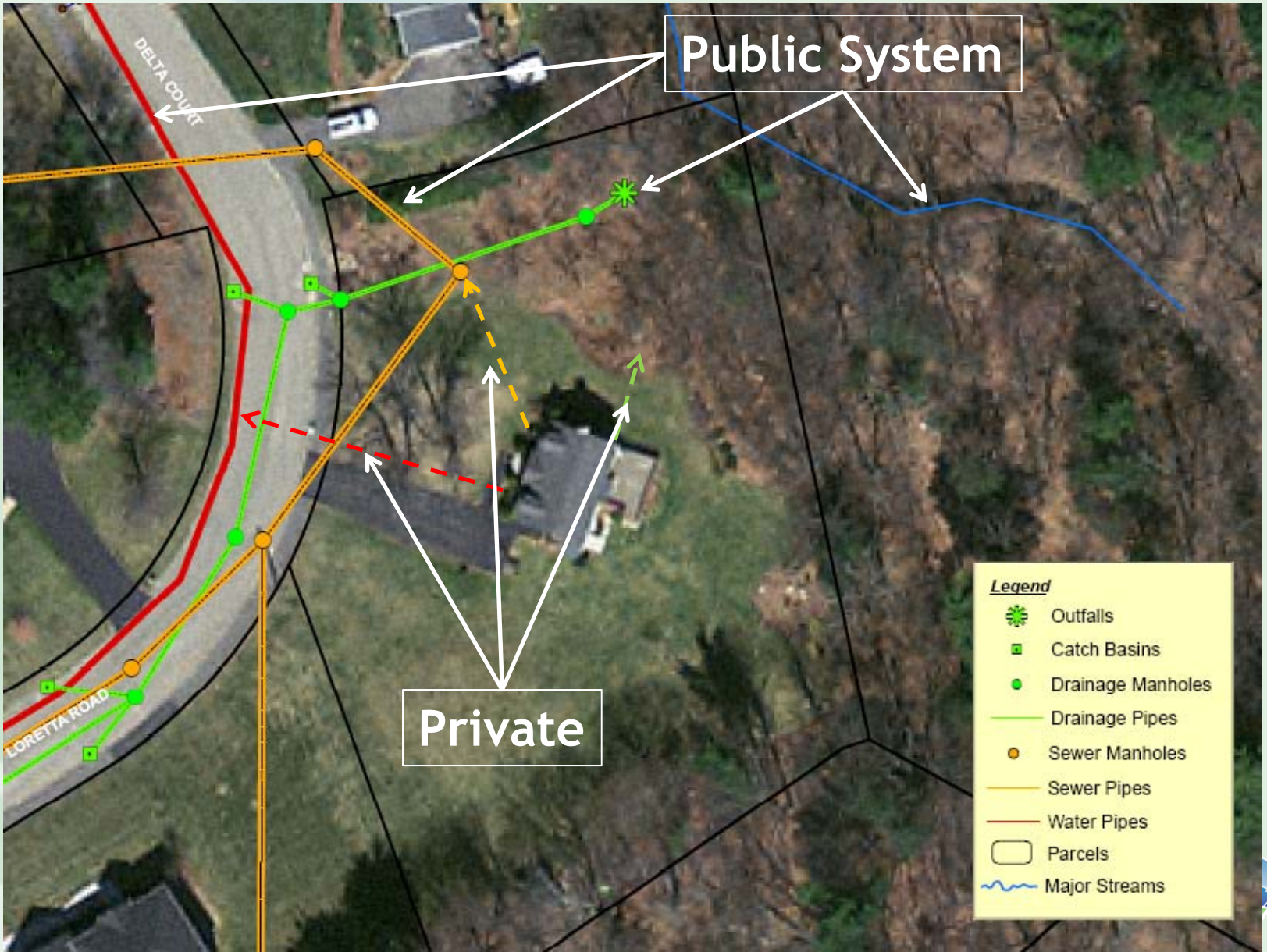
# Stormwater is Complex

- Multiple issues:
  - Flooding and drainage
  - Water quality
  - Groundwater recharge
  - Habitat/resource protection
  - Drinking water protection

# Stormwater Management Costs Money

- Capital infrastructure;
- Operations and maintenance;
- Administration and enforcement; and
- Education and outreach.

# Is Stormwater so Different?



# In MA Current Stormwater Requirements
## Under the Wetlands Protection Act and 2008 Stormwater Standards

NOI with Stormwater Form (Checklist) – 10 Standards:

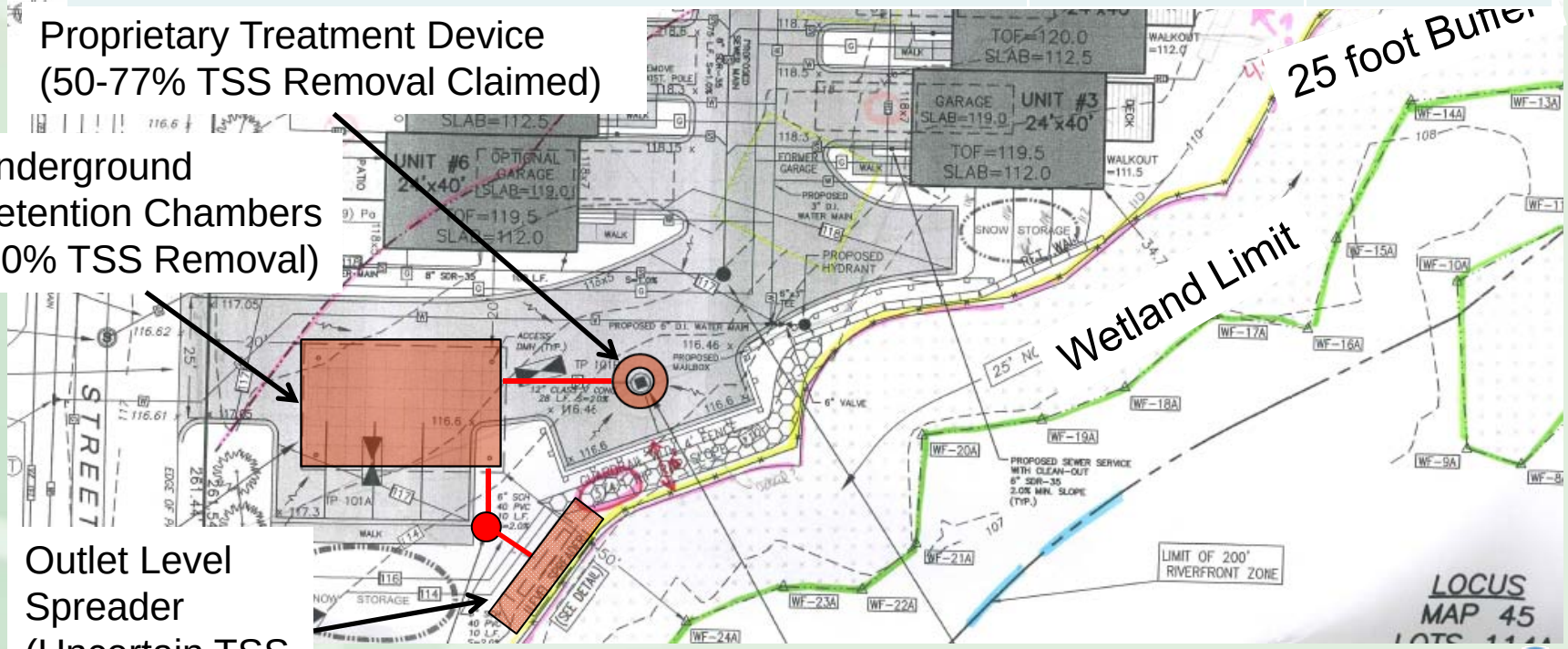
- No untreated discharges to wetlands;
- Peak Rate Attenuation (2, 10 & 100);
- Recharge;
- Water Quality (80% TSS removal game);
- LUHPPLs, Critical Areas…
- Redevelopment
- E & SC
- O & M
- No Illicit Discharges exist on site

# A Typical Application?

| BMP | TSS Removal Rate | Starting TSS Load | Amount Removed | Remaining Load |
|---|---|---|---|---|
| Proprietary Widget | 60% | 1.0 | 0.60 | 0.40 |
| Underground Ext Det. | 50% | 0.4 | 0.20 | 0.20 |
| Total TSS Removal = 80% | | | | |

Proprietary Treatment Device
(50-77% TSS Removal Claimed)

Underground
Detention Chambers
(50% TSS Removal)




Outlet Level
Spreader
(Uncertain TSS
Removal)

# Range of Stormwater Management Services

- Flood reduction/protection;
- Stream channel erosion protection/restoration;
- Street sweeping;
- Catch basin cleaning;
- Culvert repair/replacements;
- Improved stormwater planning/watershed management;
- Leaf litter pick-up/disposal
- Public education, outreach and engagements;
- Maintenance of drainage systems;
- Construction and post construction inspections;
- Construction of new capital facilities;
- Maintenance of existing and new stormwater practices


Gravel Wetlands


Sand Filters


Permeable Pavements


Open Channels


Infiltration Practices


Bioswales


Bioretention


Detention Basins

# Phosphorus Free Fertilizers


In the spring of 2005, nearly all homeowners in Madison and Dane County had to purchase phosphorus-free yard fertilizers like this from area stores.


2008 Grand Rapids MI ,


Spokane WA Detergent Phosphorus ban

# Enhanced Non-Structural Controls


Leaf/Lawn Litter Control

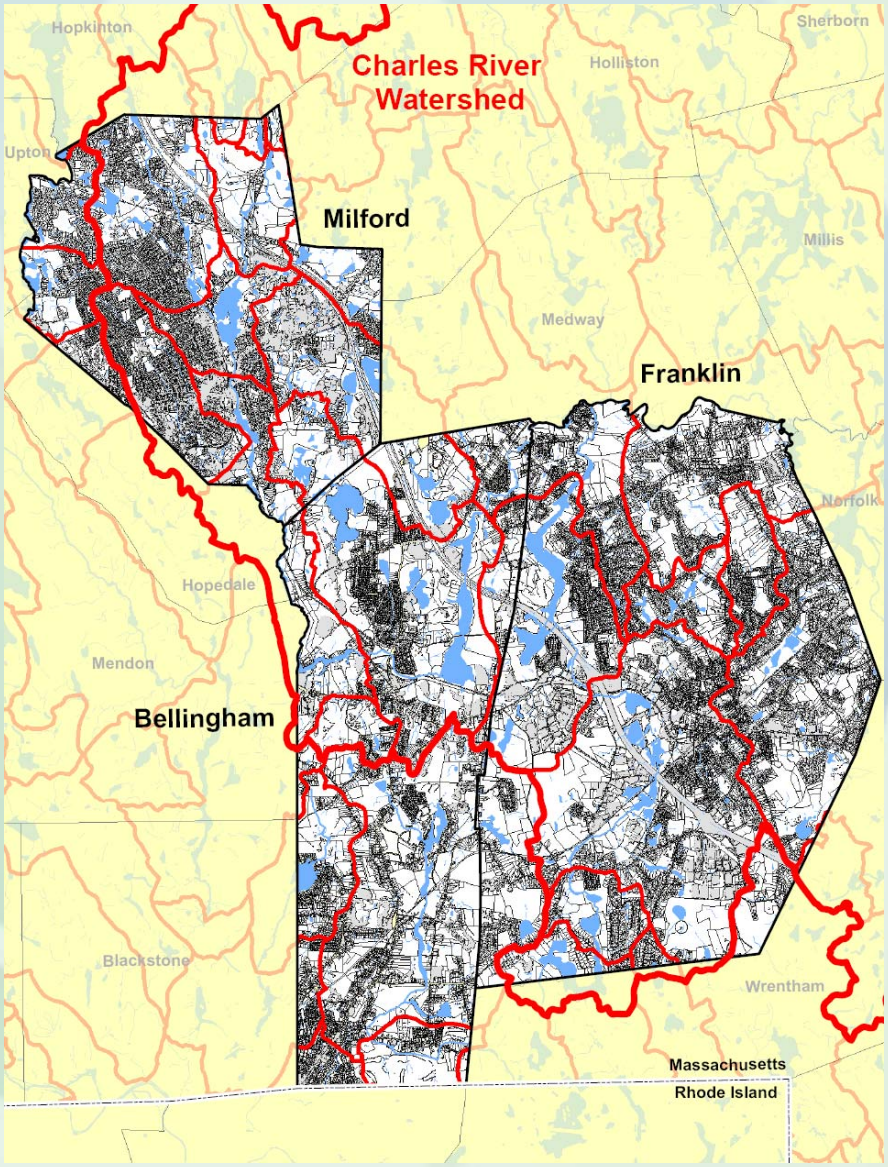

More Freq. CB Cleaning

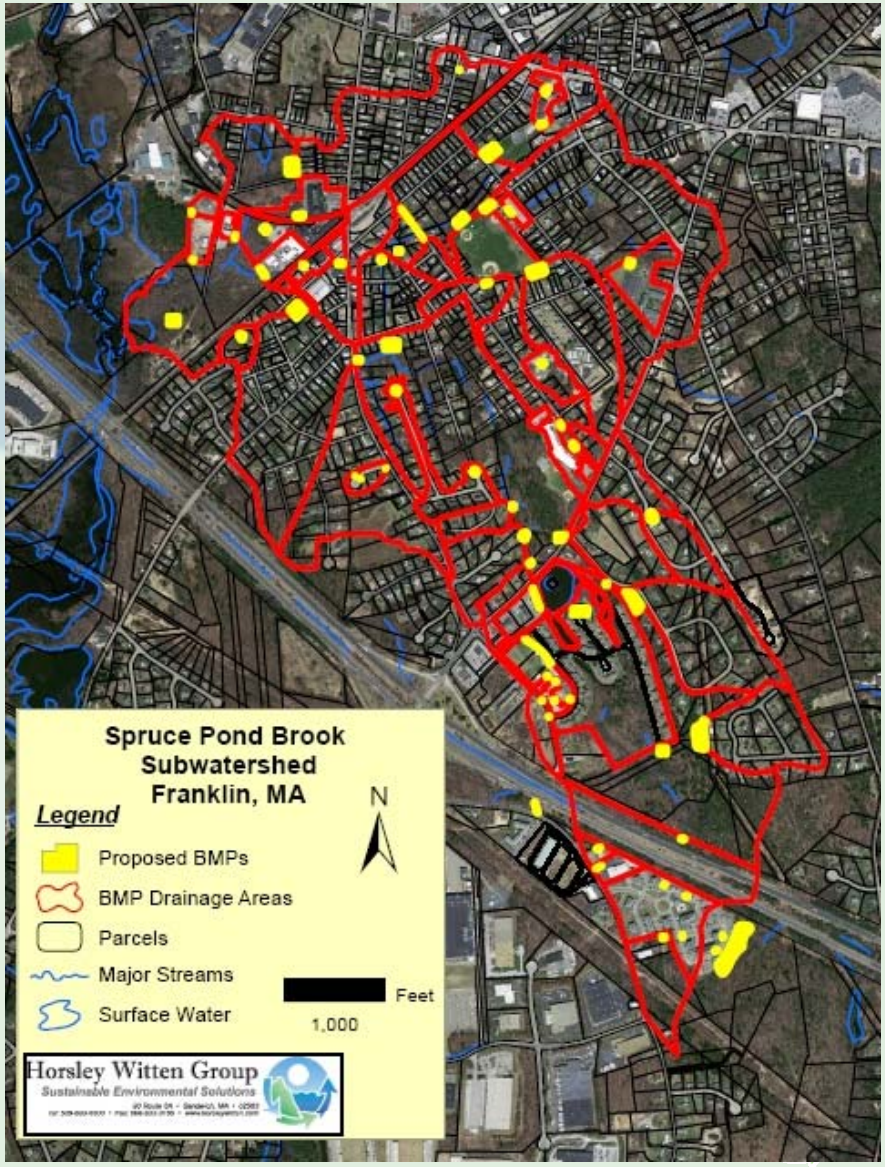
Enhanced Street Sweeping


Animal Waste Reduction

Boston Public Library, Print Department

# Watershed Planning
## (subwatershed prioritization and practice identification)



# Failed Sand Filter

# Construction of new sand filter completed

# Before Maintenance

# After Maintenance

# Typical Public Maintenance Program

- Includes maintenance of both public and private stormwater facilities
- Public facilities - parks, libraries, fire stations, DPW facilities, schools and others
- Private facilities - Municipality typically performs structural maintenance, property owners will perform aesthetic maintenance

## Inspection No. 10

**Client:** City of Peabody
**Inspector:** KMH
**Inspection Date:** 3/16/11
**Weather:** Rain, 40F

**Project Name:** Perkins Street
**Project No:** 9050
**Arrival Time:** 10:00AM
**Departure Time:** 12:00PM

Hawley Wilson Group, Inc.
90 Route 6A, Sandwich, MA 02563 Phone: (508) 833-6600 Fax: (508) 833-3150

**Personnel on site:**
Mike Rygiel (JTI)
Brandon Callahan (Peabody)

**Reference Plan:**
Perkins Street Stormwater Retrofits
Construction Plans
Peabody, MA
Date: May 6, 2010 (rev. 6/14/10)

**Contractor(s) equipment:**
None

**Work observed:**

| | |
|---|---|
| Erosion Control | ☒ |
| Clearing | ☐ |
| Excavation/Fill/Compaction | ☒ |
| Road Subbase | ☐ |
| Gravel Base | ☐ |
| Pavement/Binder Only | ☒ |
| Water | ☒ |
| Gas/Electric/Telephone | ☐ |
| Drainage | ☒ |
| Wastewater | ☒ |
| Sidewalk | ☒ |
| Final Grading | ☒ |
| Surface Stabilization | ☐ |
| Monuments | ☒ |
| Cleanup | ☐ |

**Photos Taken:** Yes ☒ No ☐

**General Notes/Comments:**

- A site walk was performed to revisit the punch-list items that were identified in December, 2010. Rain during the site visit allowed HW to assess the functionality of the various stormwater facilities. Most areas appeared to be functioning as designed but there are areas that require additional site work at all three project Phases.
- The most significant items remaining include grading and stabilization around the level spreader (Phase 3), berm reconstructive work (Phase 3), asphalt paving (Phases 1 & 3), and repairs and modifications to the irrigation pad (Phase 2). Hydroseeding is needed at much of Phase 3 and at the reinforced swales between Phases 1 & 2.
- HW will create two SK drawings showing proposed repairs and/or modifications to the various facilities. JTI shall submit prices upon receipt of the various modifications.
- The final punch-list of the remaining construction activities was updated and values assigned to each remaining task.
- Photos of several of the various outstanding tasks are included in this document. Please reference Inspection Reports 8 & 9 for additional photos and information.



Inspection No. 10

**Item 3.03:** Extend berm grading to end of the concrete level spreader to prevent runoff from bypassing the spreader. Repair existing erosion gullies and stabilize with riprap or crushed stone.

**Item 3.04:** Grading at the southeast end of the project area should be adjusted to redirect field runoff into the basin.

\\hwserver\hw-server\Projects\2009\9050 Peabody-Perkins St-Allens Lane\Contruction Admin\Inspection Reports\10316_Inspection10_9050.doc

# Example of Future Cost Items

- Update written Stormwater Mgmt Plan;
- Increased reporting/record keeping on annual reports;
- Targeted public education (2 messages to 4 audiences) and report results;
- Illicit discharge priority catchment assessments (including SSOs);
- Detailed outfall monitoring for both dry and wet weather;
- Written IDDE program with mapping and prioritization of problem catchments;
- Complete stormwater system mapping (all pipes/manholes/inlets/structures. Catch basin inspection/cleaning/inspection data;

# Future Cost Items (continued)

- Track # of site plan reviews, inspections, enforcement actions;
- ID/rank retrofit opportunities for municipally owned facilities;
- Develop a SWPPP for municipally owned facilities;
- Complete a code review and update/report;
- Impervious cover/DCIA tracking;
- Street sweeping optimization(2 times/yr);
- Written O&M procedures for municipal activities for trash, pet wastes, leaf litter control, fertilizer use & yard wastes;
- Pet waste & waterfowl mgmt plans.

# Resources, Funds & Revenue

- Resources are generally free such as volunteer labor or goods; technical information available for no cost;
- Funds are one-time $, not dependable, not predictable, likely limited;
- Revenue is regular, predictable, dependable, provide cash flow (can be borrowed against)

# The Universe of "Funding" Methods

- Modify local programs (fees/changes);
- Share Resources with other entities;
- Partner with non-profit organizations;
- Federal Programs
  - FEMA, COE, USGS, NRCS
  - FHWA (TEA 21)
- Corporate Sponsorship
  - Corp Wetland Partnership
  - Advertising
- Environmental Mitigation
- State/Regional Programs;
  - Clean Water State Revolving Loan Fund Programs (SRF);
  - 319 Nonpoint Source;
  - 604(B) WQ Planning;
  - 104(b)3
  - NOAA Coastal Pollution Remediation
- Fees for Service
- General Fund (sales/income/property taxes)
- Stormwater Utility Fees

# Massachusetts State Revolving Fund

- SRF money is not free, but it is affordable.
- SRF loans have low interest rates and cover up to 100% of a project's costs with no matching requirement on behalf of the borrower (grants, typically require the grantee to provide matching funds that must be available at the start of a project).

# MA SRF Eligible Projects

"planning and construction of projects, including CSO mitigation, new wastewater treatment facilities and upgrades of existing facilities, infiltration/inflow correction, wastewater collection systems, and nonpoint source pollution abatement projects, such as landfill capping, community programs for upgrading septic systems (Title 5), brownfield remediation, pollution prevention, and stormwater remediation"

# MA SRF Eligible Projects

"non-structural projects are eligible for SRF funding; e.g., planning projects for nonpoint source problems which are consistent with the MassDEP's Nonpoint Source Management Plan and that identify pollution sources and suggest potential remediation strategies.

- Note 20% of SRF eligible funding should go towards Green Project Reserve (GPR), categories include:
  - Energy efficiency;
  - Green infrastructure/LID;
  - Water efficiency;
  - Environmentally Innovative.

http://www.mass.gov/dep/water/wastewater/cwsrffs.htm

# Lets Dig into the Stormwater Utility Option

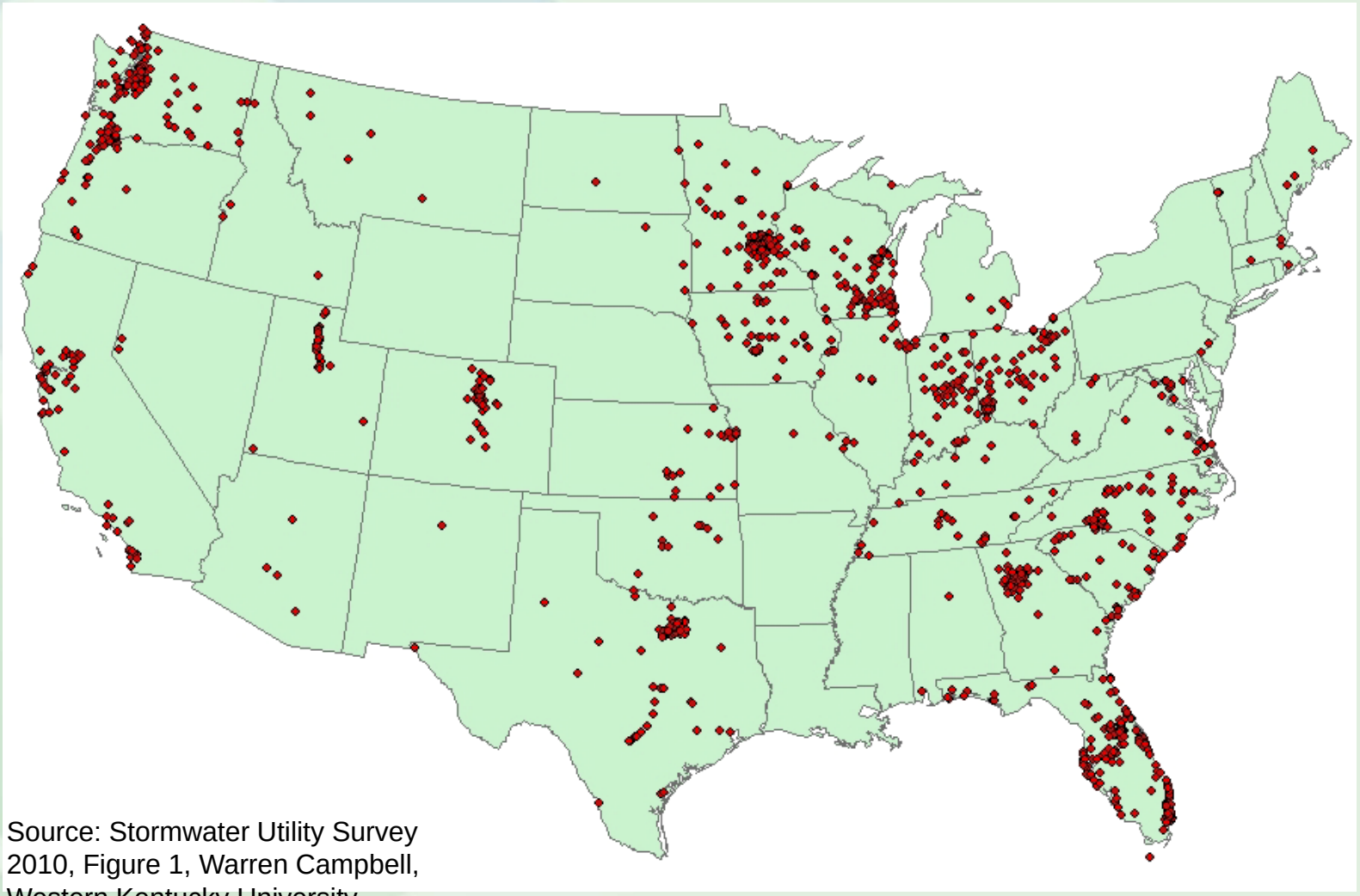
## Flexible

- Primary source for the whole program;
- Other fees still exist provide equity;
- Credits to encourage/promote desired behavior;
- Geographically based?
- Can take into account variable environmental costs.

## Equitable

- Costs a function of:
  - Runoff volume
  - Runoff rate
  - Pollutant loading
- Each of the above are directly related to amount of impervious cover.

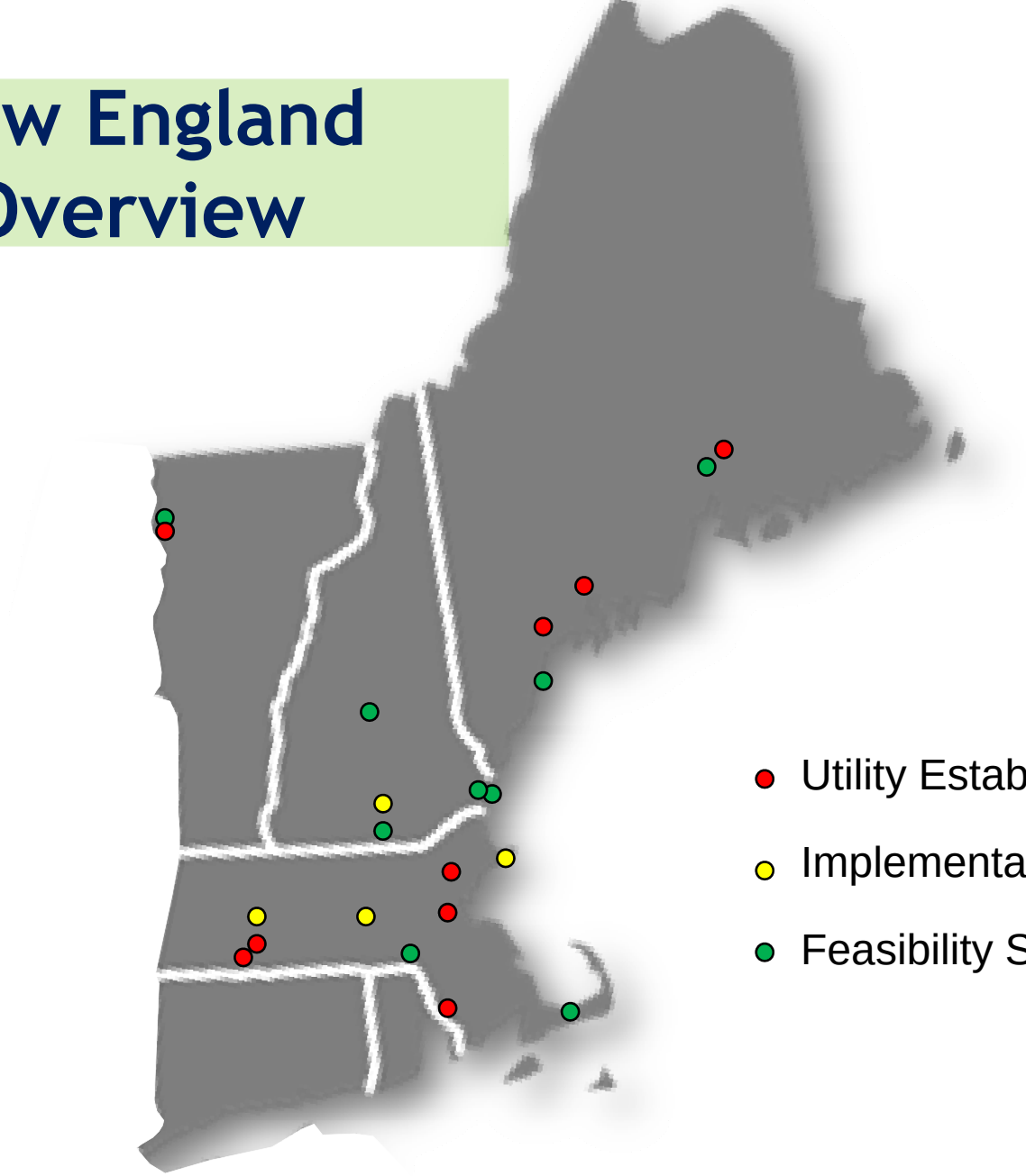
# Existing Stormwater Utilities



Source: Stormwater Utility Survey 2010, Figure 1, Warren Campbell, Western Kentucky University

Courtesy amec

# New England Overview



- Utility Established
- Implementation Underway
- Feasibility Study

Courtesy amec

# Status of NE Stormwater Utilities

Existing Established Entities:

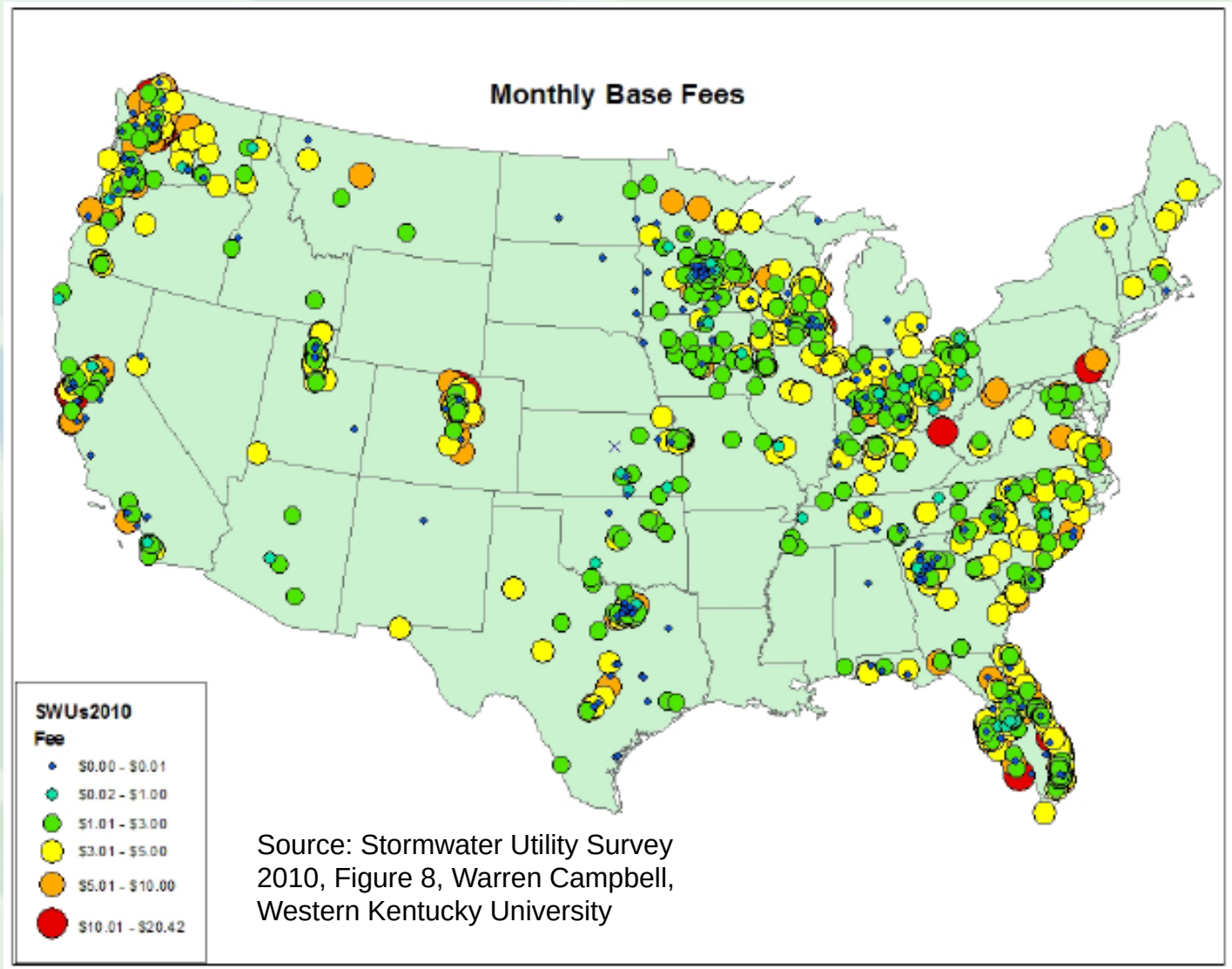
- S. Burlington, VT;
- Lewiston, ME;
- Chicopee, MA;
- Reading, MA;
- Newton, MA

Augusta & Orono, ME &
Fall River & Westfield, MA
(i.e., Quasi-utilities – line item on a sewer bill)

Feasibility Studies in MA:

- Upper Charles;
- Yarmouth;
- Gloucester;
- Auburn;
- Northampton.

# Distribution of SM Utility Monthly Fees Across the US



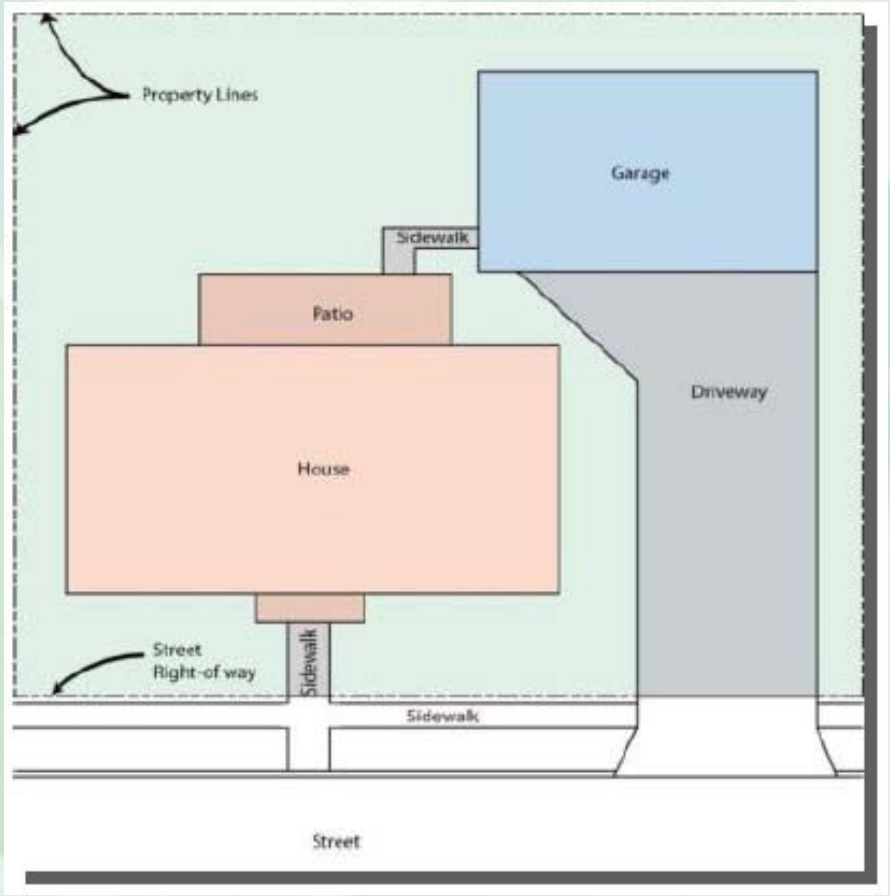

Source: Stormwater Utility Survey 2010, Figure 8, Warren Campbell, Western Kentucky University

# Massachusetts Legal Considerations

- Clear provisions in MGL 83 Sec. 1A and 16
  - Construct drains or sewers to reduce nutrient impacts;
  - Charge for the use of sewers and main drains.
- But not fully vetted in wide-spread application
  - What are "drains" and "sewers"?
  - What is the definition of "use" of these systems?
  - There is a "due diligence" process required by local government to establish the fee.

- Regulatory Fees:
  - Needed to regulate activities for the public good;
  - Not related to the cost of providing the service;
  - Typically a secondary funding method for specific purpose (e.g., peer review fees).
- User Fees requirements:
  - Be able to be identified separately from other services (not general funds);
  - Be "voluntary" in that there is a way to reduce or avoid the fee (through credits);
  - Be related to the level of "use" of the services (rational nexus).

# How are Fees Typically Calculated?
## Equivalent Residential Unit (ERU)

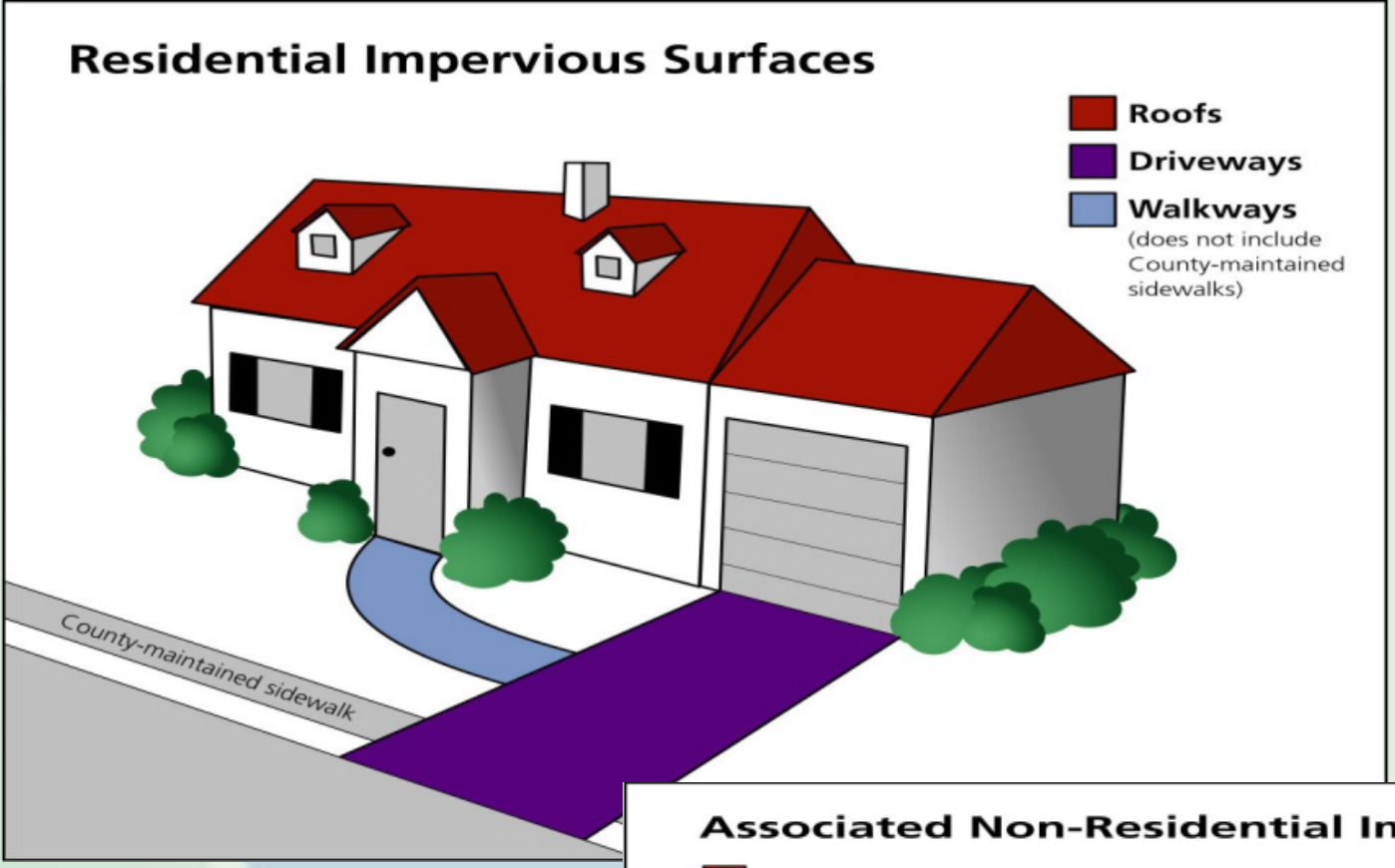


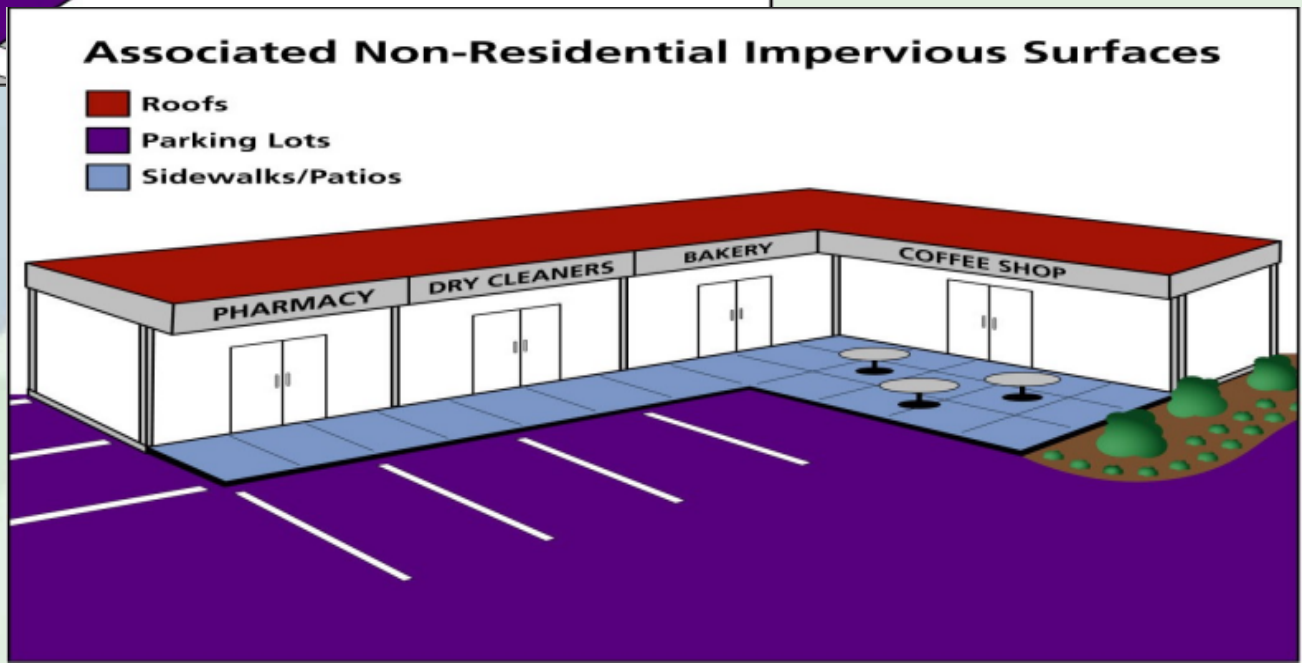

Graphic courtesy AECOM
Pewaukee Feasibility Study

- Average single-family residential impervious cover (based on best GIS or statistical sample) = 1 ERU
- Impervious area = house, patio, garage, driveway, and on-lot sidewalk
- Typical value = 2,700 sq ft to 3,500 sq ft

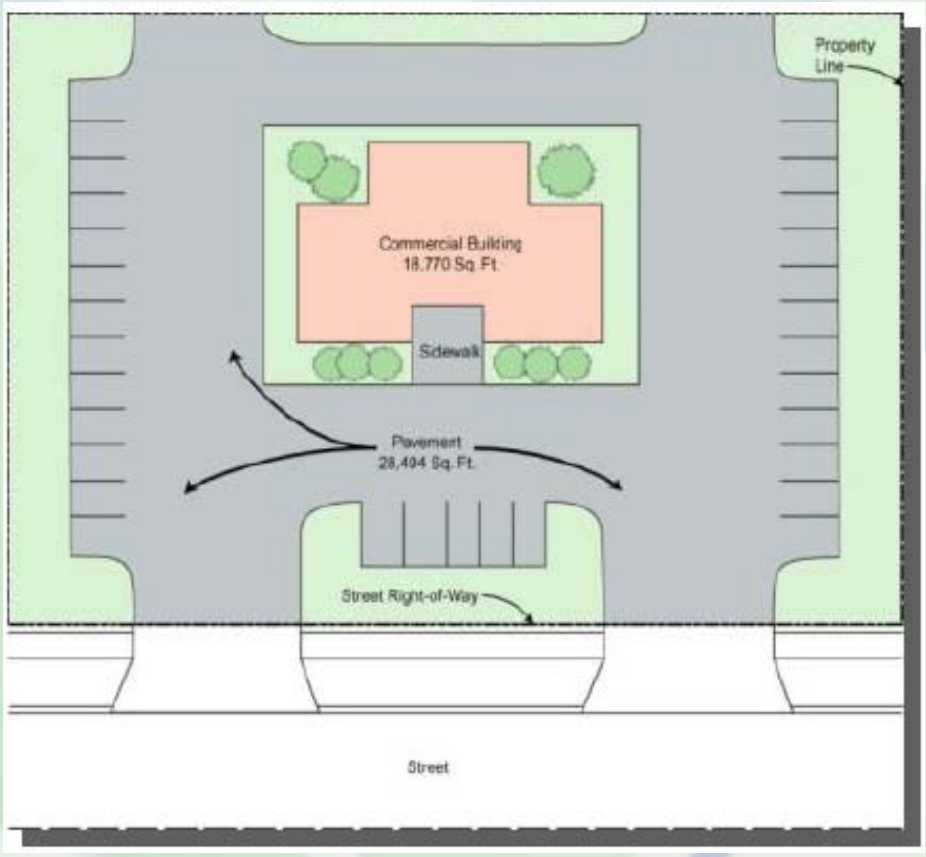
# Residential Tiers

- Allows for variations in ERU fee structure for the range of development patterns and demand on municipal stormwater service;
- Tier analysis required (assessor's data, zoning info, review required services/cost);
- Typically no more than 3 tiers (high, medium, low density residential) – for example.
  - HDR = 1.5 ERU
  - MDR = 1.0 ERU
  - LDR = 0.75 ERU


Residential Impervious Surfaces
Roofs
Driveways
Walkways
(does not include County-maintained sidewalks)
County-maintained sidewalk


Associated Non-Residential Impervious Surfaces
Roofs
Parking Lots
Sidewalks/Patios
PHARMACY
DRY CLEANERS
BAKERY
COFFEE SHOP

# Non-Residential Properties Billed as Multiples of the ERU




- Total site impervious area/ERU = # of ERUs

Example:

Total commercial site IA = 47,260 sf/3,500 sf = 13.5 use 14 ERUs.

Graphic courtesy AECOM
Pewaukee Feasibility Study

# Adjustments and Credits

- Adjustments:
  - For added or removed impervious cover
  - To correct data (where better/more accurate information is provided)
- Credits:
  - Required per state law (legal challenges);
  - Properties that don't drain to the MS4;
  - For created/mitigative conditions
    - On-site water quality treatment systems;
    - On-site flood controls
    - On-site operation & maintenance is occurring

# Establishing the Fees

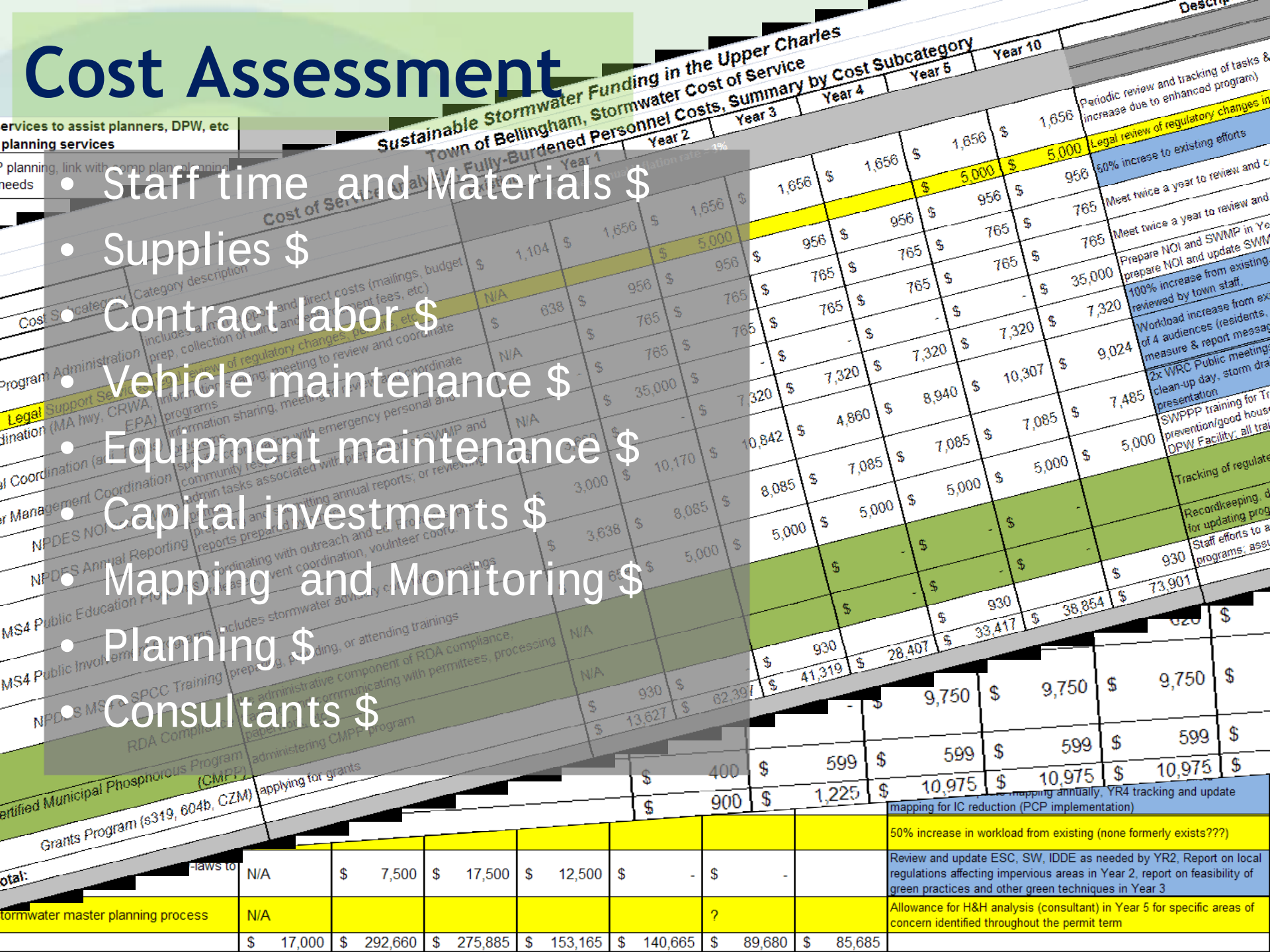
$$\text{ERU rate (\$/ERU)} = \frac{\text{Total \$ Needed for Services}}{\text{Total ERUs in Municipality}}$$

For Example: Assume annual service requirements = $1.25M, and community has 11,000 ERUs;

ERU = $1,250,000/11,000 = $113/yr or approx. $10/month

# Cost Assessment

- Staff time and Materials $
- Supplies $
- Contract labor $
- Vehicle maintenance $
- Equipment maintenance $
- Capital investments $
- Mapping and Monitoring $
- Planning $
- Consultants $



# What are the potential revenues?

In General:

- For every $1 dollar per month per ERU
- A utility can typically generate about $20 to $35 per developed acre per year.
- The National “Average” ≈ $4.00/mo

# Stormwater Utility Options

Obviously there are lots of them:

- Add-on to an existing entity (e.g., Wastewater Management District)
- Entirely new entity in each municipality;
- Entirely new regional entity.

# Advantages of a Regional Approach

- Some things have no geographic boundaries (e.g. education);
- Some things will benefit from more opportunities to do them (e.g. potential phosphorous reduction sites);
- Some things have administrative fixed costs which could be spread across a bigger base.

# A Case for a Regional Entity

- Economies of scale;
- Better able to gain outside funding;
- Watershed consistency – cross jurisdictional;
- Less local politics;
- Better access to talent;
- Local governments perhaps not as much resources;
- Can undertake bigger projects;
- Would match regulatory programs' geography

# Who might not like a stormwater utility?

- Tax exempt property owners;
- Properties with very large impervious surfaces;
- Those on fixed incomes;
- Some developers;

- And as my colleague Andy Reese likes to say: "Maybe Everyone"

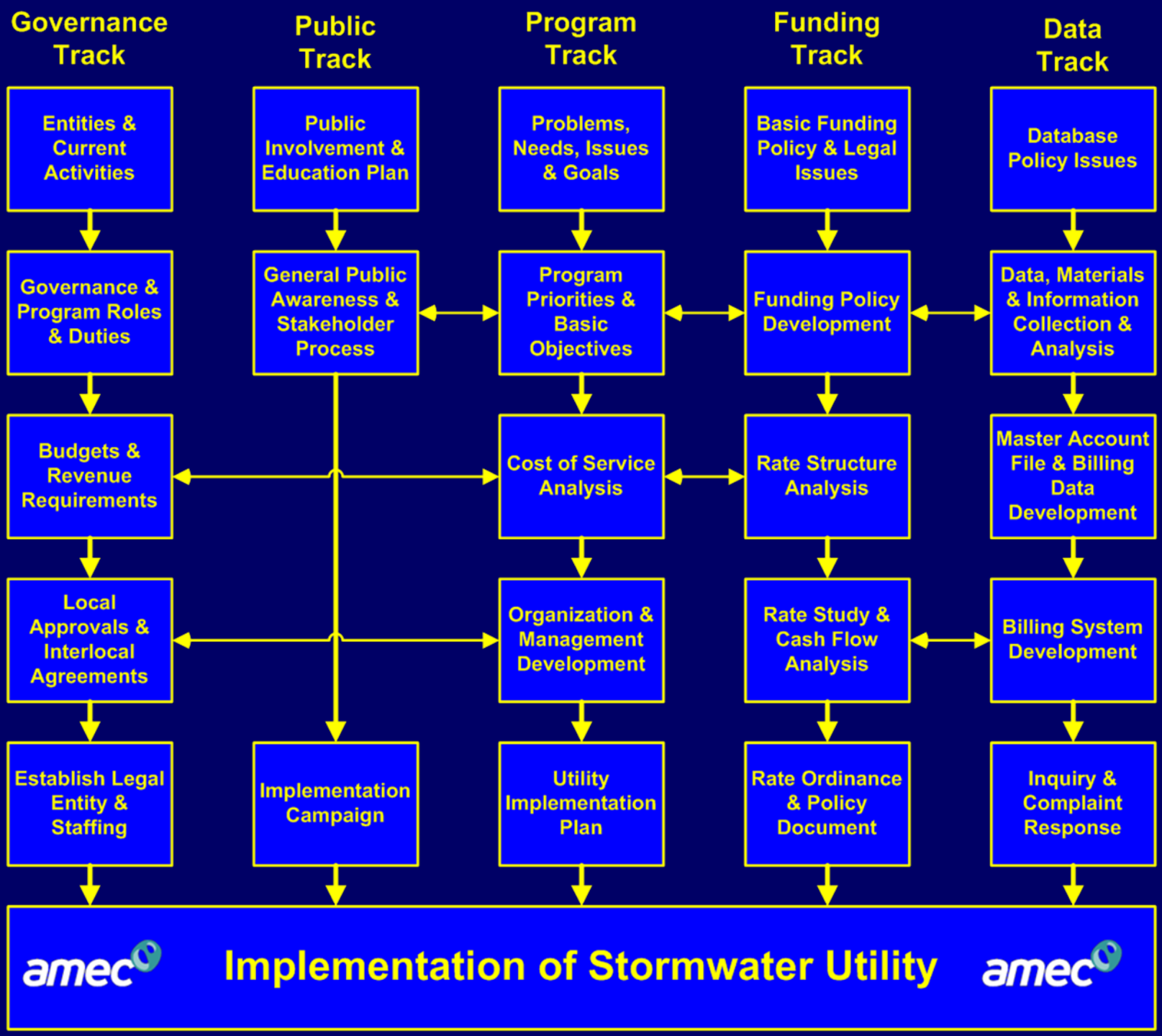
# Implementation Details

*Setting up a successful utility will require the community to pay particular attention to the details.*

- Governance and consensus across municipal departments;
- The "Program" is clearly defined and a strong argument is made;
- Public and Political Education and Support;
- Financial procedures and policies; and
- Accurate and complete database and customer service is provided

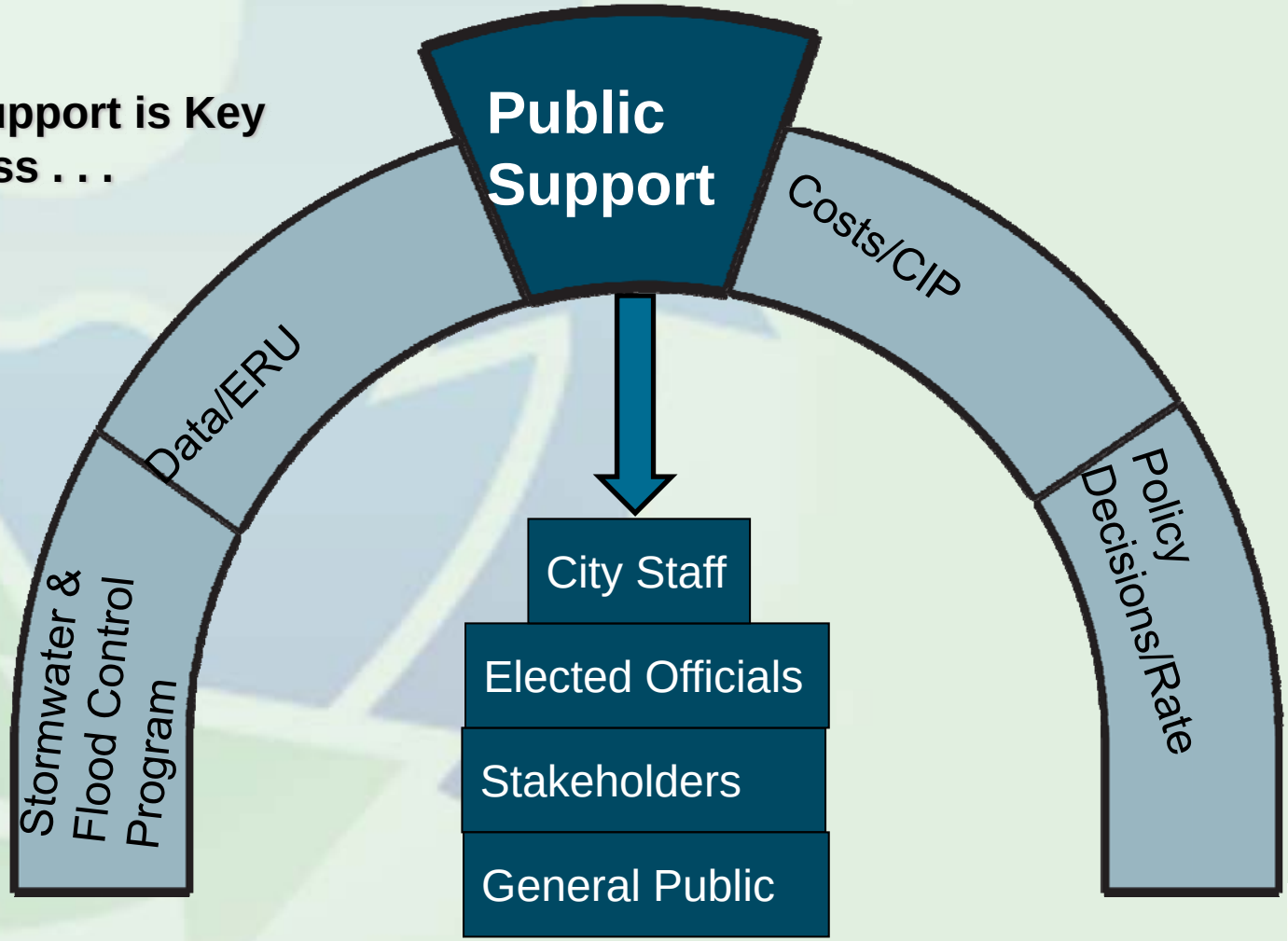
# Process for Utility Implementation

- Advisability Study (background-case-cost/revenue);
- Feasibility Study (business plan);
- Implementation
  - Public outreach
  - Develop/adopt utility ordinance
  - Adopt rate and credit resolutions
  - Incorporate into billing process


Governance Track
Public Track
Program Track
Funding Track
Data Track
Entities & Current Activities
Public Involvement & Education Plan
Problems, Needs, Issues & Goals
Basic Funding Policy & Legal Issues
Database Policy Issues
Governance & Program Roles & Duties
General Public Awareness & Stakeholder Process
Program Priorities & Basic Objectives
Funding Policy Development
Data, Materials & Information Collection & Analysis
Budgets & Revenue Requirements
Cost of Service Analysis
Rate Structure Analysis
Master Account File & Billing Data Development
Local Approvals & Interlocal Agreements
Organization & Management Development
Rate Study & Cash Flow Analysis
Billing System Development
Establish Legal Entity & Staffing
Implementation Campaign
Utility Implementation Plan
Rate Ordinance & Policy Document
Inquiry & Complaint Response
amec
Implementation of Stormwater Utility
amec

# This is NOT an Engineering Exercise . . .

**Public Support is Key to Success . . .**




Courtesy amec

# Success or Failure – It's All in the Process . . .

- Follow an effective process and get good advice.
- Involve the community early enough and in the right ways – GET PUBLIC SUPPORT.
- Make your program and user fee easy to understand.
- Prepare your elected officials for negative feedback – give them solutions.
- Think of the long-term benefits and recognize the pain is worth the gain.
- Spend the money it takes – you get what you pay for.

Courtesy amec

# Additional Resources

- **Western Kentucky University Stormwater Utility Survey, 2010:** http://wku.edu/engineering/wp-content/uploads/2010/07/Western-Kentucky-University-SWU-Survey-2010.pdf
- **Black and Veatch 2010 Stormwater Utility Survey**: http://www.bv.com/markets/management_consulting/Stormwater_Survey.aspx
- **EPA Fact Sheet: Funding Stormwater Programs:** http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/FundingStormwater.pdf
- **Charles River Watershed Association: Assessment of Stormwater Financing Mechanisms in New England:** **http://www.crwa.org/projects/stormwater/swutility.html**
- **New England Environmental Finance Center: Stormwater Utility Fees: Considerations and Options:** 2005 http://efc.muskie.usm.maine.edu/docs/StormwaterUtilityFeeReport.pdf
- **U.S. Environmental Protection Agency, Watershed Academy. Catalog of Federal Funding Sources for Watershed Protection** http://cfpub.epa.gov/fedfund
- **2011 Rhode Island LID Site Planning and Design Guidance Document** http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/t4guide/lidplan.pdf