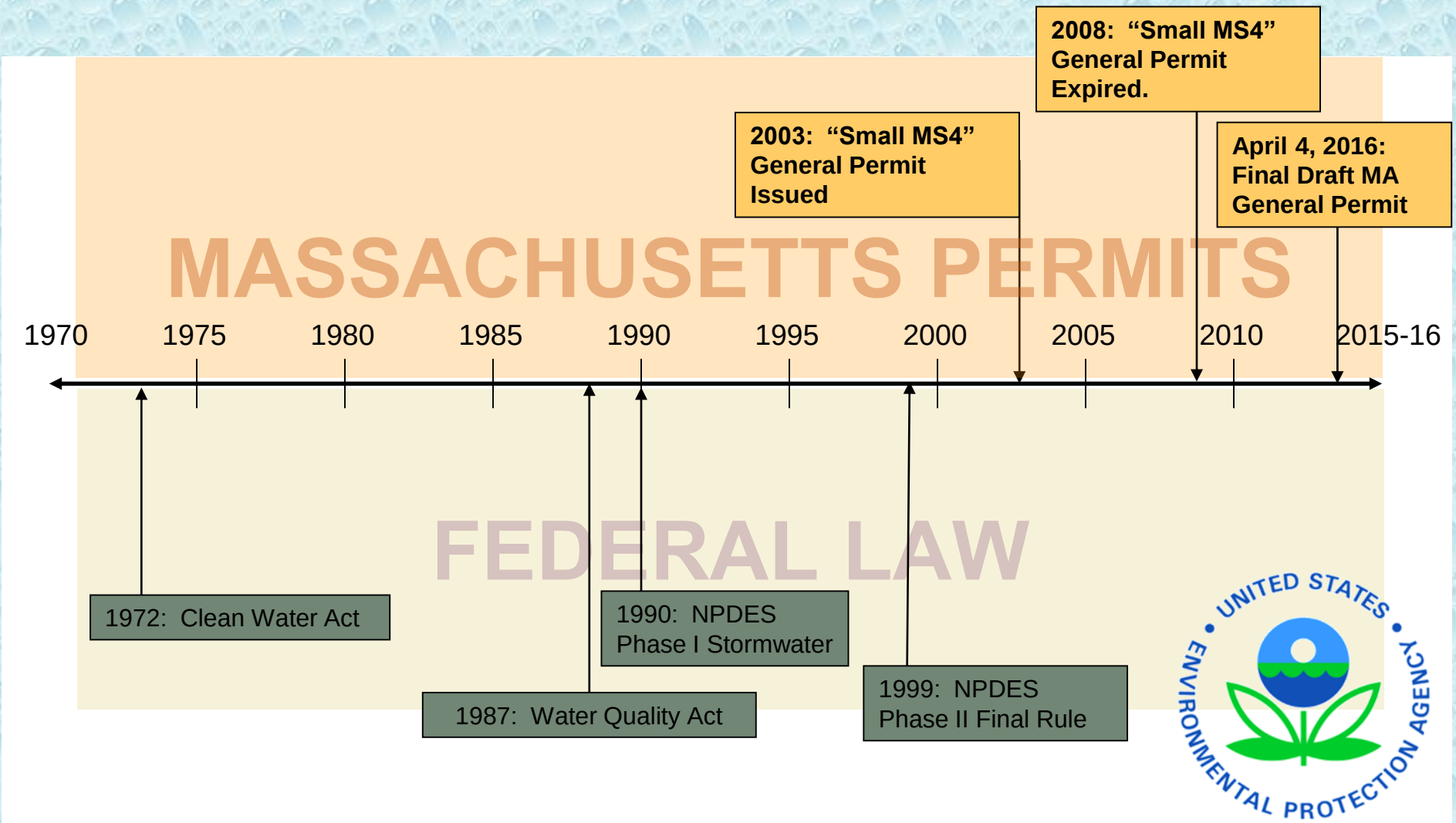
Stormwater Management:

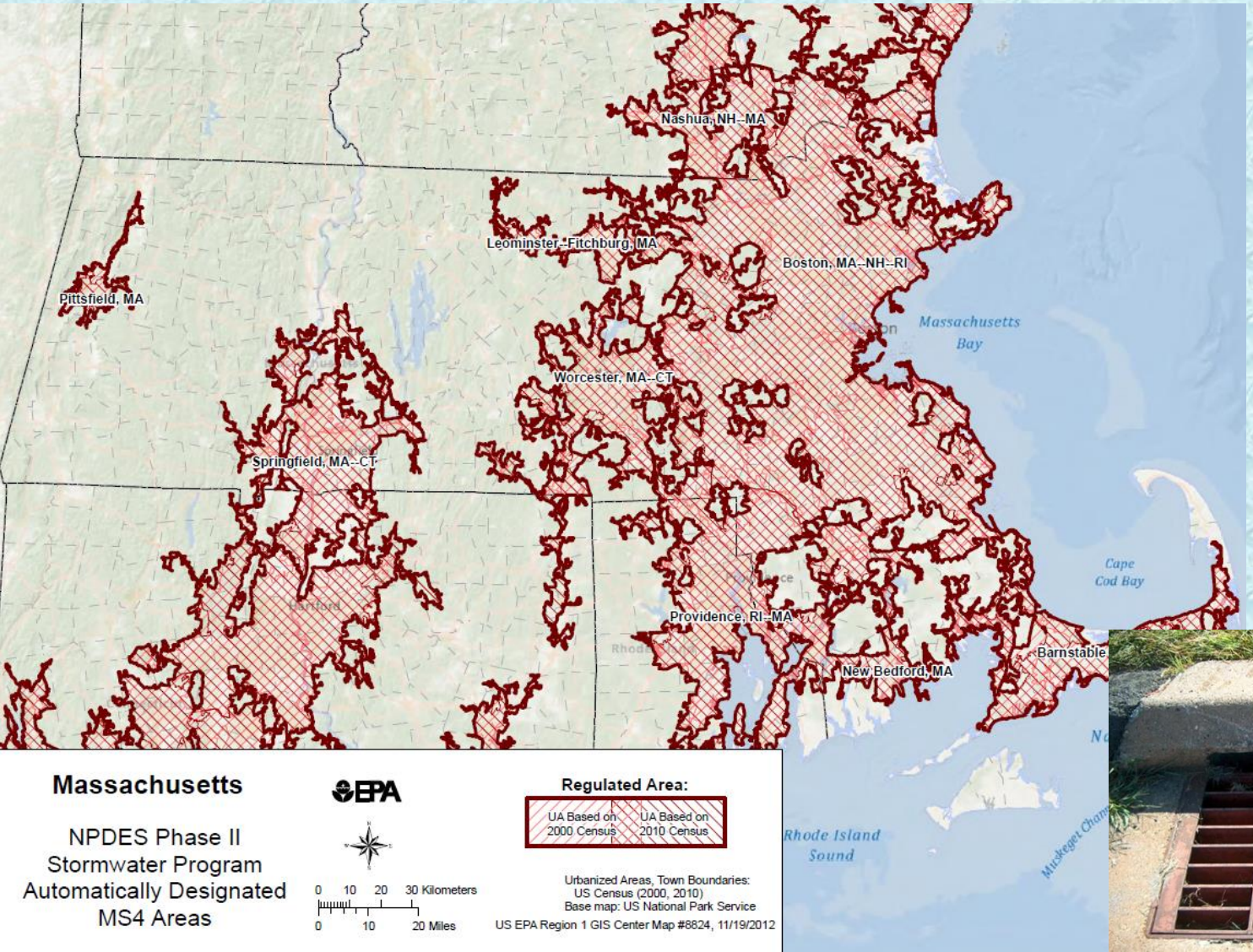
- MS4
- Financing

J. Conroy, AICP
MAPC Sr. Environmental Planner

Municipal Separate Storm Sewer System Permit (MS4)



MS4 Regulated Areas

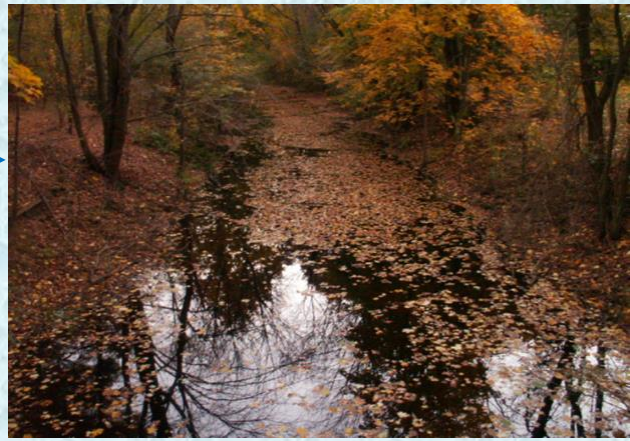


- Drainage conveyance: roadway drainage pipes, catch basins, ditches, etc.
- Municipally owned or operated
- Includes country drainage

Stormwater Runoff

- Rainwater that falls on paved streets, lawns, parking lots, and sidewalks becomes polluted stormwater.
- The more impervious surface, the more stormwater runoff and impact to receiving water bodies.

Runoff Discharges to Nearby Waterways



Typical pollutants in stormwater are trash, oil, fertilizers, sediment, sand, and bacteria

Pollutants of Concern

Pollutant Impacts on Water Quality

Sediment	Sediment is a common component of stormwater, and can be a pollutant. Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids (TSS), a common water quality analytical parameter.
Nutrients	Nutrients including nitrogen and phosphorous are the major plant nutrients used for fertilizing landscapes, and are often found in stormwater. These nutrients can result in excessive or accelerated growth of vegetation, such as algae, resulting in impaired use of water in lakes and other sources of water supply. For example, nutrients have led to a loss of water clarity in Lake Tahoe. In addition, un-ionized ammonia (one of the nitrogen forms) can be toxic to fish.
Bacteria and Viruses	Bacteria and viruses are common contaminates of stormwater. For separate storm drain systems, sources of these contaminants include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have led to the closure of beaches, lakes, and rivers to contact recreation such as swimming.
Oil and Grease	Oil and grease includes a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaking and breaks in hydraulic systems, restaurants, and waste oil disposal.
Metals	Metals including lead, zinc, cadmium, copper, chromium, and nickel are commonly found in stormwater. Many of the artificial surfaces of the urban environment (e.g., galvanized metal, paint, automobiles, or preserved wood) contain metals, which enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Over half the trace metal load carried in stormwater is associated with sediments. Metals are of concern because they are toxic to aquatic organisms, can bioaccumulate (accumulate to toxic levels in aquatic animals such as fish), and have the potential to contaminate drinking water supplies.
Organics	Organics may be found in stormwater at low concentrations. Often synthetic organic compounds (adhesives, cleaners, sealants, solvents, etc.) are widely applied and may be improperly stored and disposed. In addition, deliberate dumping of these chemicals into storm drains and inlets causes environmental harm to waterways.
Pesticides	Pesticides (including herbicides, fungicides, rodenticides, and insecticides) have been repeatedly detected in stormwater at toxic levels, even when pesticides have been applied in accordance with label instructions. As pesticide use has increased, so too have concerns about the adverse effects of pesticides on the environment and human health. Accumulation of these compounds in simple aquatic organisms, such as plankton, provides an avenue for biomagnification through the food web, potentially resulting in elevated levels of toxins in organisms that feed on them, such as fish and birds.
Gross Pollutants	Gross Pollutants (trash, debris and floatables) may include heavy metals, pesticides, and bacteria in stormwater. Typically resulting from an urban environment, industrial sites and construction sites, trash and floatables may create an aesthetic "eye sore" in waterways. Gross pollutants also include plant debris (such as leaves and lawn-clippings from landscape maintenance), animal excrement, street litter, and other organic matter. Such substances may harbor bacteria, viruses, vectors, and depress the dissolved oxygen levels in streams, lakes and estuaries sometimes causing fish kills.
Vector Production	Vector production (e.g., mosquitoes, flies, and rodents) is frequently associated with sheltered habitats and standing water. Unless designed and maintained properly, standing water may occur in treatment control BMP's for 72 hours or more, thus providing a source for vector habitat and reproduction (Metzger, 2002).

Source: California Stormwater Quality Association, Stormwater BMP Handbook, 2003.

Stormwater Bylaws and Regulations – New Permit

SW Regulation Review and Updates:

- Due within 2 years of the permit effective date (i.e., October 2018 at the earliest)
- Amendment of bylaws:
  - Require compliance with MassDEP Stormwater Standards (if not already);
  - BMPs which will "prevent or minimize impacts to water quality"
  - Retain and/or treat first 1" of runoff
- Infiltration near "environmentally sensitive areas" must have the ability to "shutdown" in the event of an emergency spill
- Avoid disturbance of natural areas

Non-Stormwater Bylaws and Regulations – New Permit

LID and Green Infrastructure Evaluation

Step 1: Street Design and Parking Lot Guidelines

- Due within 3 years of permit effective date
- Develop a report assessing current guidelines and other local requirements that affect impervious cover
- Make recommendations and a schedule to update standards to minimize imperious cover attributable to parking areas and street design
- Implement plan

Source: *http://www.upstreammatters.com/green-infrastructure-low-impact-development-providing-watershed-resiliency-for-more-sustainable-communities/*

Non-Stormwater Bylaws and Regulations – New Permit

LID and Green Infrastructure Evaluation

Step 2: MS4-Wide LID and Green Infrastructure

- Due within 4 years of permit effective date
- Develop a report assessing current guidelines and other local requirements to determine feasibility of allowing (where site conditions are appropriate):
  - **Green Roofs**
  - **Infiltration practices** such as rain gardens, porous pavement, and other designs to manage runoff with landscaping and augmented soils
  - **Water harvesting devices** such as rain barrels and cisterns, and the use of stormwater for non potable uses
- Make recommendations and a schedule to update standards
- Implement plan

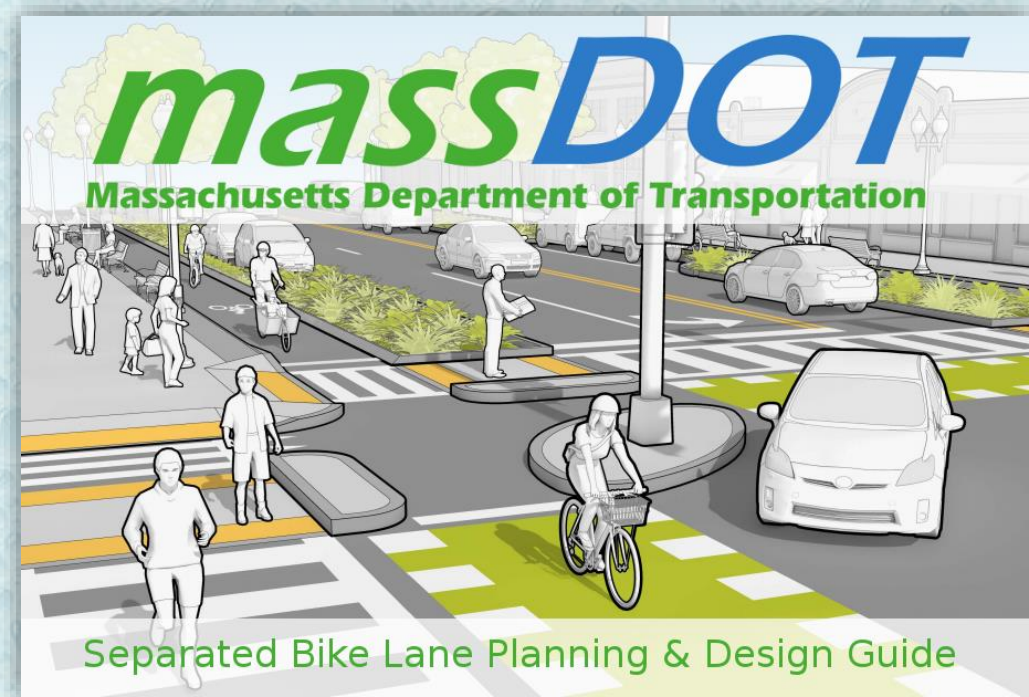
Source: https://www.epa.gov/soakuptherain/rain-barrels

Non-Stormwater Bylaws and Regulations – New Permit

LID and Green Infrastructure Evaluation

Other Considerations?

- Complete Streets
- Sustainable Water Management Initiative (SWMI)



Audience Poll

Who acts as the stormwater program coordinator in your community?

A. Town Engineer
B. DPW Director
C. Conservation Agent
D. Planner
E. Other

How can Local Planning Departments Participate?

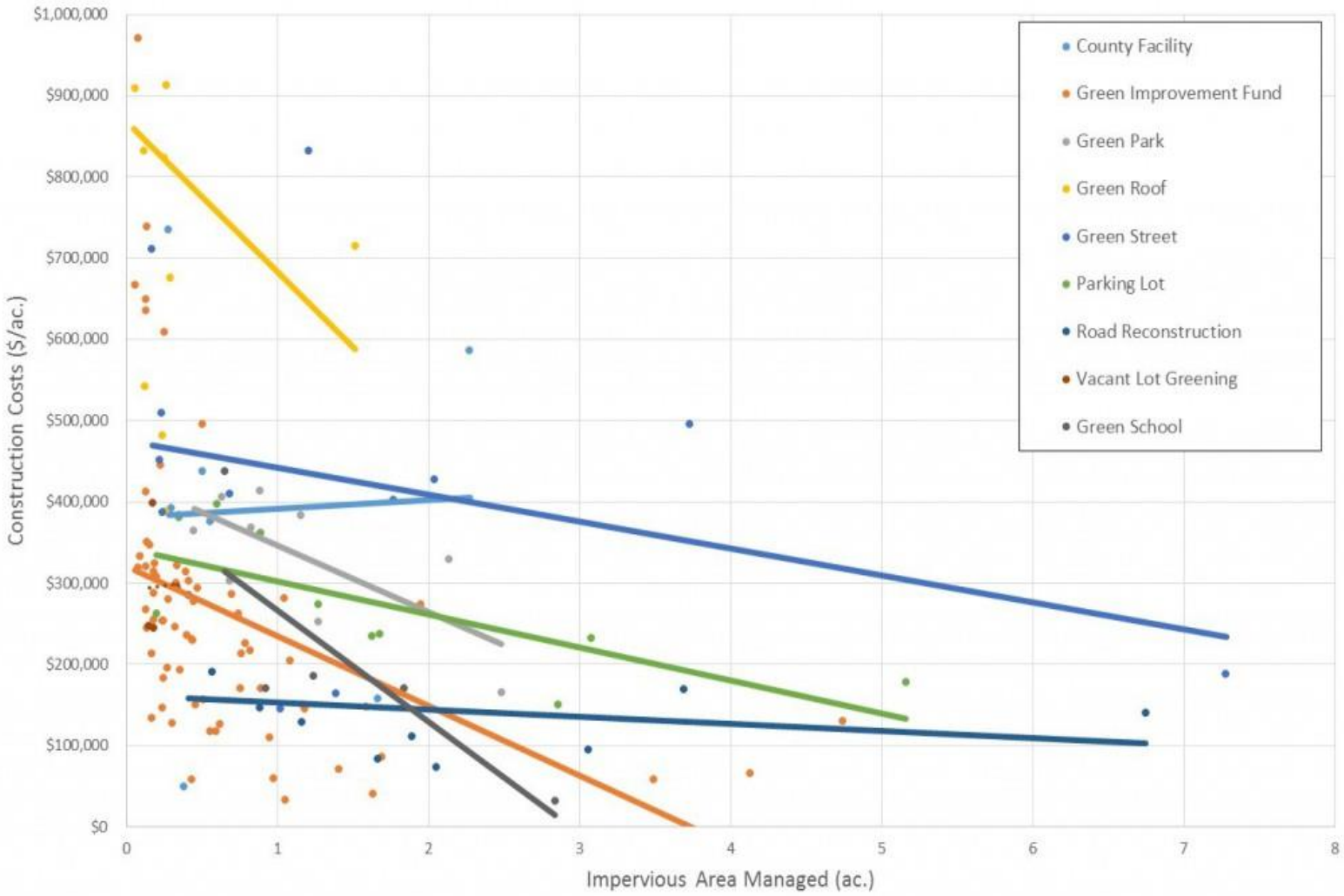
1. Stormwater Management Plan (SWMP)
2. Stormwater Bylaws and Regulations
    - 2003 Requirements
    - New Permit: Regulatory Review and Updates
3. Non-Stormwater Bylaw LID and Green Infrastructure Assessment

SW Management Costs

Hard to Determine…

- Existing are costs not clearly tracked
- New costs vary from one muni to another

Cost data from 127 green SW infrastructure projects in Onondaga County, N.Y….Shows the influence of both scale and implementation program. *Source: CH2M*



SW Management Costs

How do you estimate?

From EPA Summer 2015 Fact Sheet:

+ $15,000 - $180,000 increase each year – over permit term

Average 20% increase above 2003 permit:

- + 40% - CB Cleaning/Sweeping
- + 30% - Engineering/ops.
- + 18% - Planning/Ed
- +12% - Removing Ilicit Connects.

IDDE program mgmt. cost increases significant from 2003

Existing Financing Options

- Property tax: competition with other municipal financing needs
- Grants: very limited for implementation
- **Stormwater drainage fee**

- Long-term, fee-based revenue
- Impervious cover to measure volume
- Similar to water/sewer fees
- Best established with an enterprise fund

Drainage Fee Premise & Principles

Premise:

a) Stormwater drainage system is a public system/service!

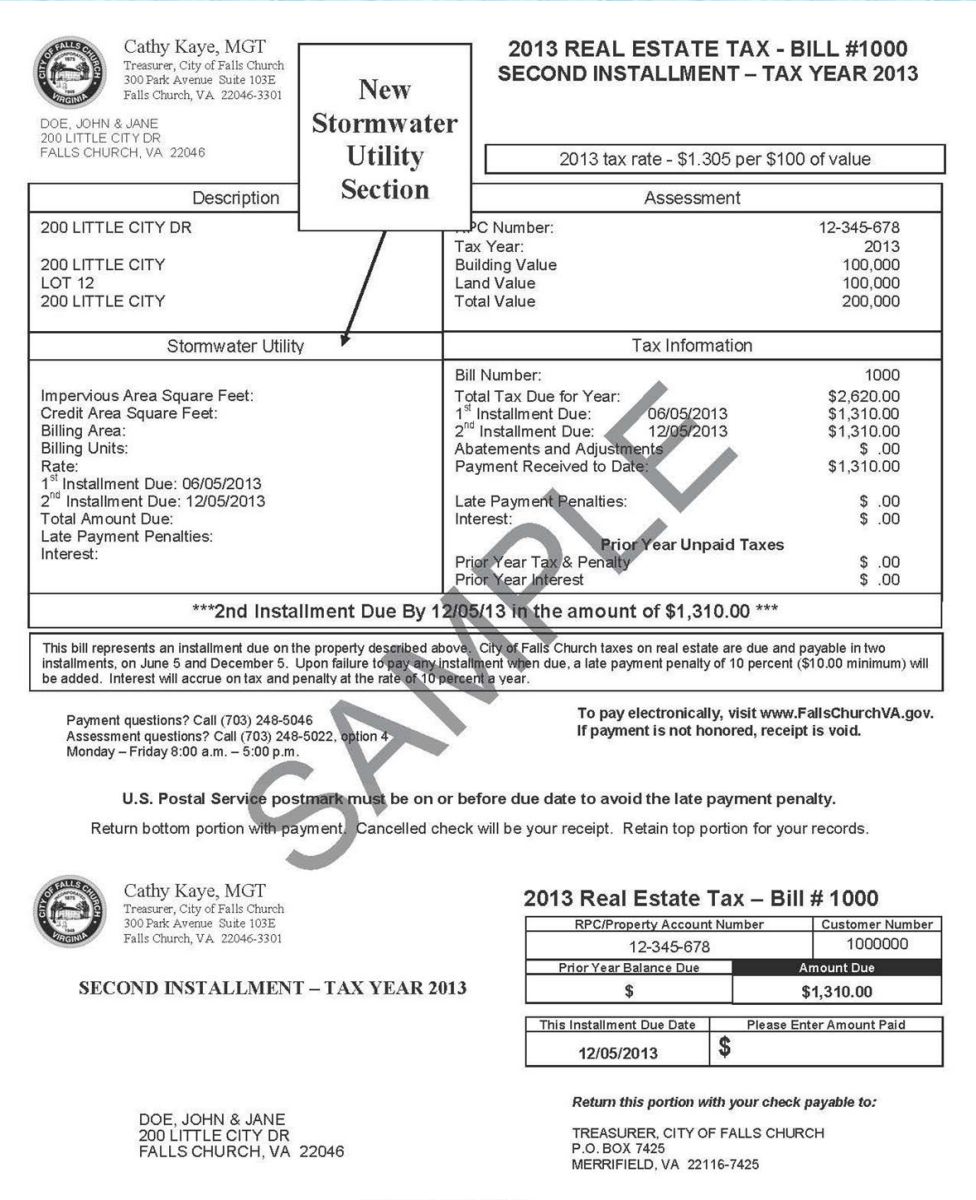
b) Fee is established just like drinking water rate (can equate volume of runoff per sq ft of impervious just like gallons per person usage)

Principles:

✓ Equitable,

✓ Stable, and

✓ Sustainable



Cathy Kaye, MGT
Treasurer, City of Falls Church
300 Park Avenue Suite 103E
Falls Church, VA 22046-3301

DOE, JOHN & JANE
200 LITTLE CITY DR
FALLS CHURCH, VA 22046

New Stormwater Utility Section

2013 REAL ESTATE TAX - BILL #1000
SECOND INSTALLMENT – TAX YEAR 2013

2013 tax rate - $1.305 per $100 of value

Description	Assessment	
200 LITTLE CITY DR	RPC Number:	12-345-678
	Tax Year:	2013
200 LITTLE CITY	Building Value	100,000
LOT 12	Land Value	100,000
200 LITTLE CITY	Total Value	200,000

Stormwater Utility	Tax Information		
	Bill Number:		1000
Impervious Area Square Feet:	Total Tax Due for Year:		$2,620.00
Credit Area Square Feet:	1st Installment Due:	06/05/2013	$1,310.00
Billing Area:	2nd Installment Due:	12/05/2013	$1,310.00
Billing Units:	Abatements and Adjustments		$ .00
Rate:	Payment Received to Date:		$1,310.00
1st Installment Due: 06/05/2013			
2nd Installment Due: 12/05/2013	Late Payment Penalties:		$ .00
Total Amount Due:	Interest:		$ .00
Late Payment Penalties:	**Prior Year Unpaid Taxes**		
Interest:	Prior Year Tax & Penalty		$ .00
	Prior Year Interest		$ .00

*****2nd Installment Due By 12/05/13 in the amount of $1,310.00 *****

This bill represents an installment due on the property described above. City of Falls Church taxes on real estate are due and payable in two installments, on June 5 and December 5. Upon failure to pay any installment when due, a late payment penalty of 10 percent ($10.00 minimum) will be added. Interest will accrue on tax and penalty at the rate of 10 percent a year.

Payment questions? Call (703) 248-5046
Assessment questions? Call (703) 248-5022, option 4
Monday – Friday 8:00 a.m. – 5:00 p.m.

To pay electronically, visit www.FallsChurchVA.gov.
If payment is not honored, receipt is void.

U.S. Postal Service postmark must be on or before due date to avoid the late payment penalty.

Return bottom portion with payment. Cancelled check will be your receipt. Retain top portion for your records.

SAMPLE

Cathy Kaye, MGT
Treasurer, City of Falls Church
300 Park Avenue Suite 103E
Falls Church, VA 22046-3301

SECOND INSTALLMENT – TAX YEAR 2013

2013 Real Estate Tax – Bill # 1000

RPC/Property Account Number	Customer Number
12-345-678	1000000
Prior Year Balance Due	**Amount Due**
$	$1,310.00

This Installment Due Date	Please Enter Amount Paid
12/05/2013	$

DOE, JOHN & JANE
200 LITTLE CITY DR
FALLS CHURCH, VA 22046

Return this portion with your check payable to:

TREASURER, CITY OF FALLS CHURCH
P.O. BOX 7425
MERRIFIELD, VA 22116-7425

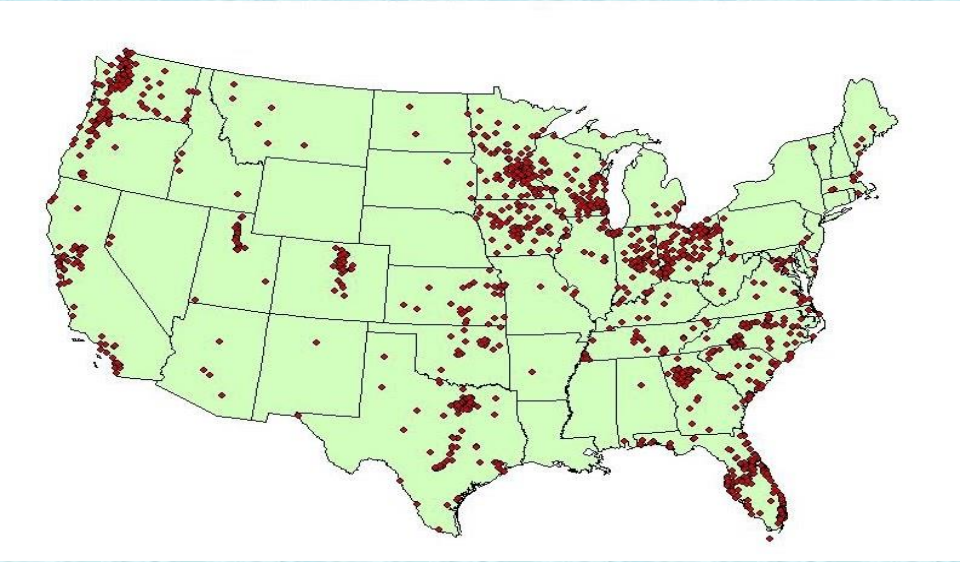
Credit: City of Falls Church, VA

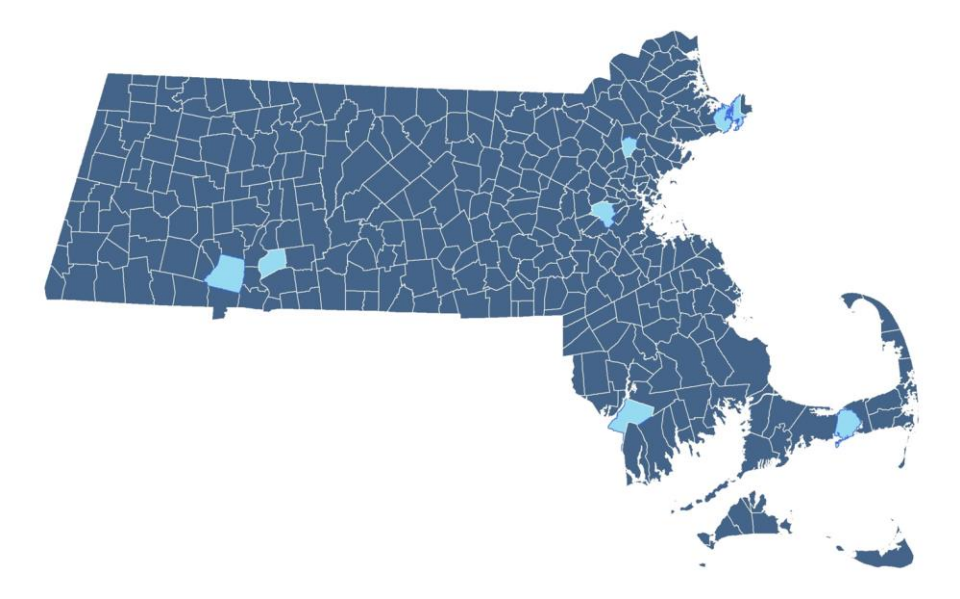
Numerous Benefits of a Fee

- Allowed by MA General Law
- Encouraged by EPA/DEP
- Transparent to Public
- Flexible Programming
- Incentivizes pollutant reduction
- Can include tax exempt properties
- **Allocates cost by contribution to the problem!**
- **Reduce competition with other budget priorities**

Who Has One?

- **>3,000 in US!**
- Gloucester
- Reading
- Newton
- Yarmouth
- Fall River
- Chicopee
- Westfield
- Northampton
- Milton





Stormwater Financing/Utility Starter Kit

Stormwater Financing/Utility Starter Kit

Funding provided by the U.S. Environmental Protection Agency and the U.S. Department of Housing and Urban Development Partnership for Sustainable Communities.

Prepared for:

The 101 Cities and Towns of Greater Boston

DRAFT
March 23, 2014

Prepared by:

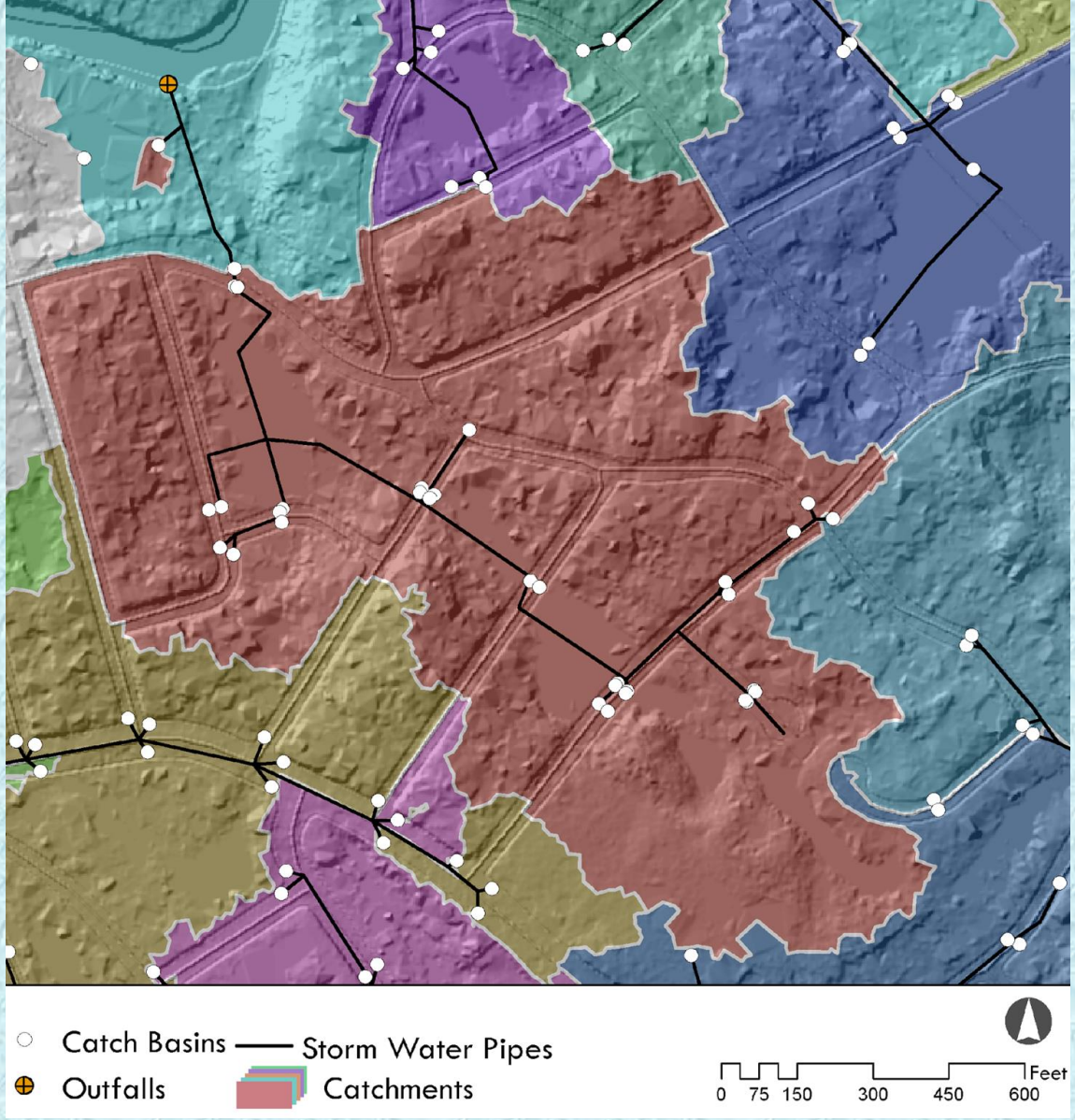
Metropolitan Area
Planning Council
60 Temple Place, 6th Floor
Boston, Massachusetts 02111
Tel (617) 933-0700
www.mapc.org

What does it help you do?

1. **Define:** Water Quality Problems & Mgmt. Needs
2. **Determine:** Fee Structure
3. **Deliver:** Outreach Program
4. **Develop:** Management Program
5. **Draft:** Laws/Regs

Define Needs

- Water Quality/Quantity Projects
- MS4 Compliance
- Management - Staff:
  - Operations
  - Administration
  - Engineering
- Infrastructure Repair
- Planning/GIS
- Development Plan/Permitting Review

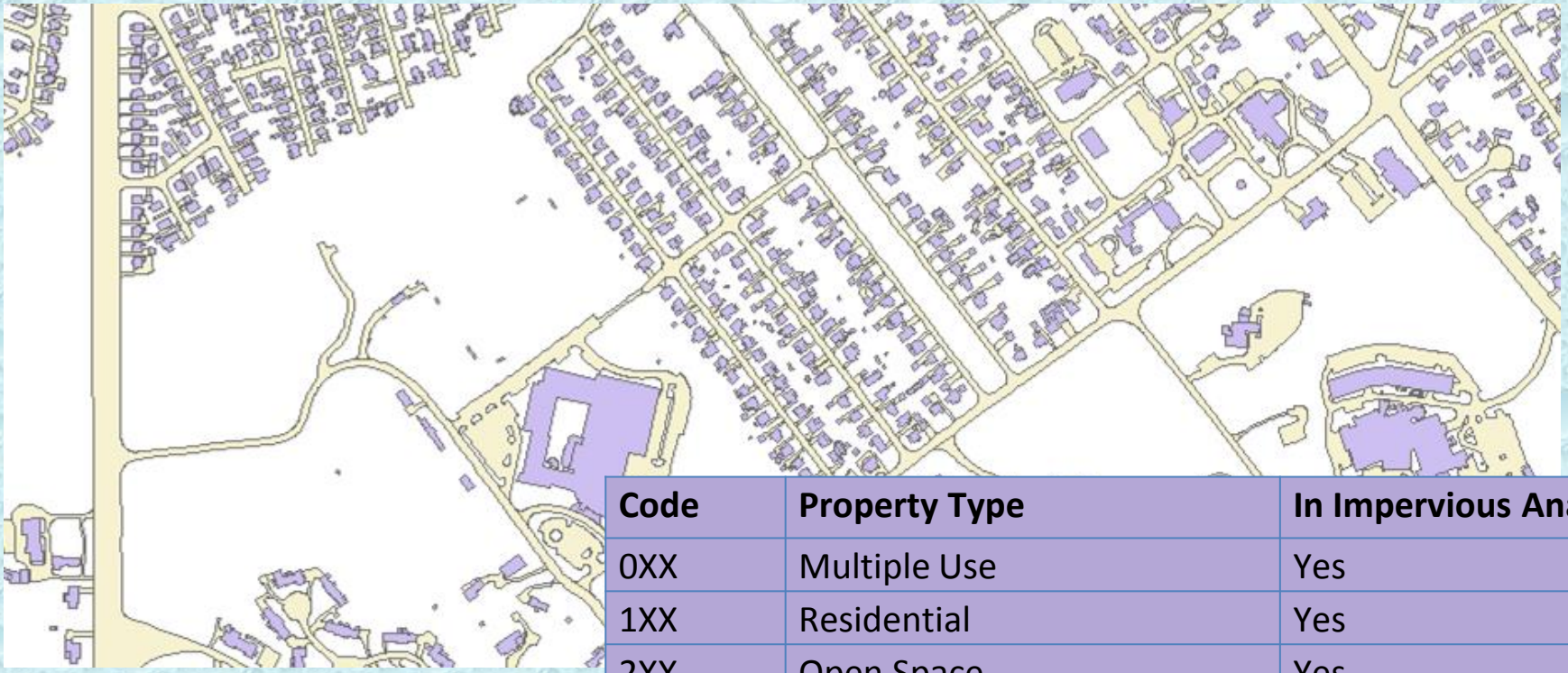


Determine Fee Structure:

Example Expenditures

Category/Item	Total (MS4 Permit Year 1)
Administration	$83,553
Regulation/Enforcement	$13,500
Engineering and Master Planning	$366,795
Operations and Implementation	$575,113
Monitoring	$17,650
TOTAL:	$1,056,611

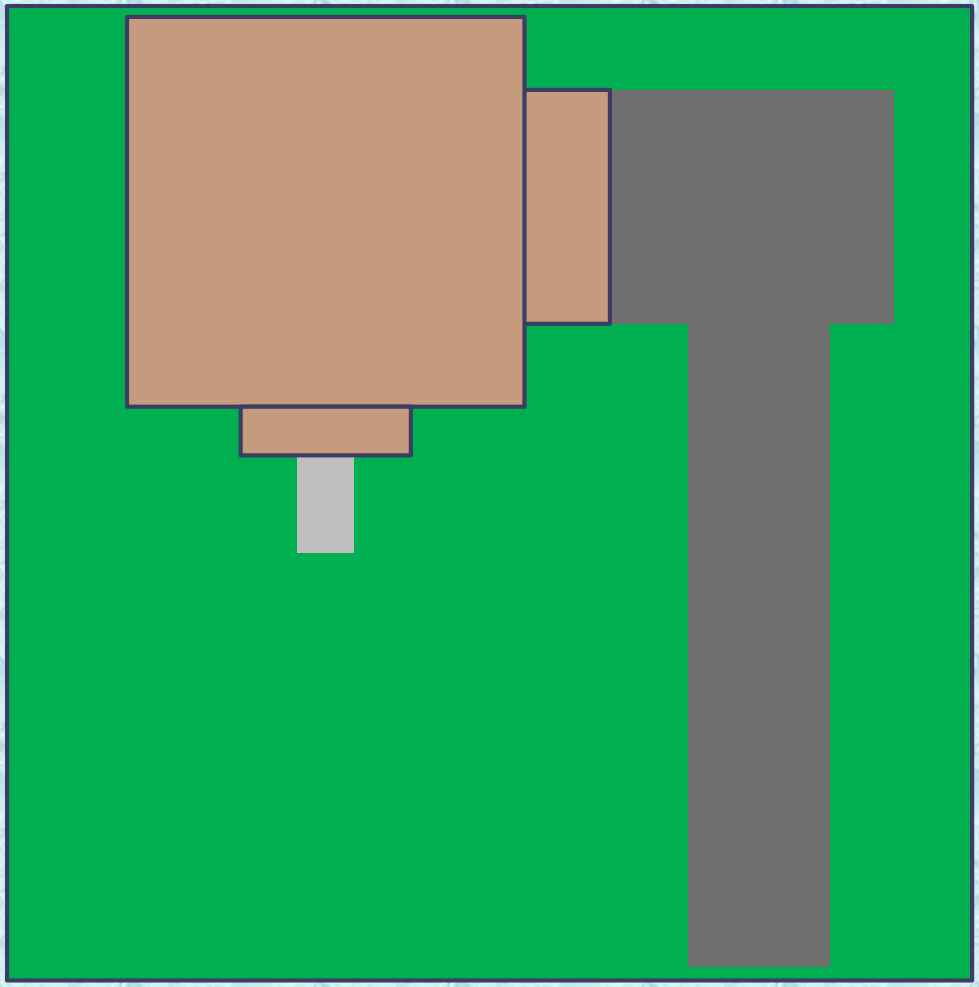
Determine Fee: Impervious Analysis



Code	Property Type	In Impervious Analysis?
0XX	Multiple Use	Yes
1XX	Residential	Yes
2XX	Open Space	Yes
3XX	Commercial	Yes
4XX	Industrial	Yes
5XX	Personal Property	No – Not Found
6XX	Forest (Chapter 61)	No – Pervious
7XX	Agricultural (Ch. 61A)	Yes – Some Impervious
8XX	Recreational (Ch. 61B)	Yes – Some Impervious
9XX	Tax Exempt Property	Yes

What Counts as Impervious Surface?

- Paved or built areas that prevent rainwater from soaking into the ground
- Includes driveways, buildings, parking lots, patios, etc.



Determine Fee: Rate Options

1. Flat fee - based only on the number of parcels in Town against costs;

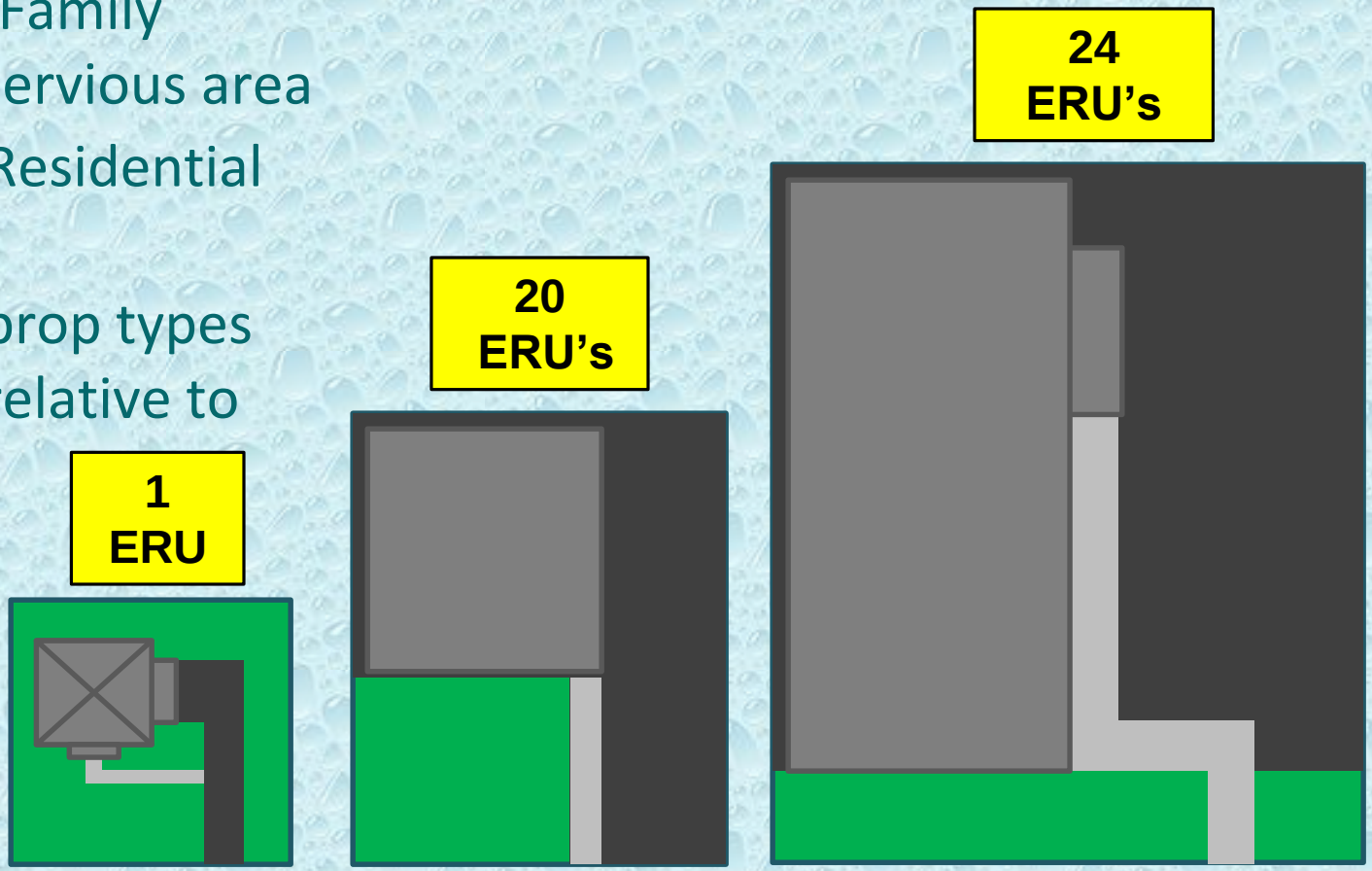
1. Graduated fee - per land use classification using an Equivalent Residential Unit (ERU);

1. Proportional fee - based on impervious surface data for each parcel; and

1. Distributed fee - using a square root of the proportional calculations.

Determine Fee: Graduated/ERU

- Average Single Family Residential impervious area
- = 1 Equivalent Residential Unit (ERU)
- Fees for other prop types are calculated relative to ERU



Residential
2,500 sq ft imp.
$160/yr

Commercial
50,800 sq ft imp.
$3,000/yr

Institutional (tax exempt)
60,500 sq ft imp.
$4,000/yr

Determine Fee: Graduated (ERU)

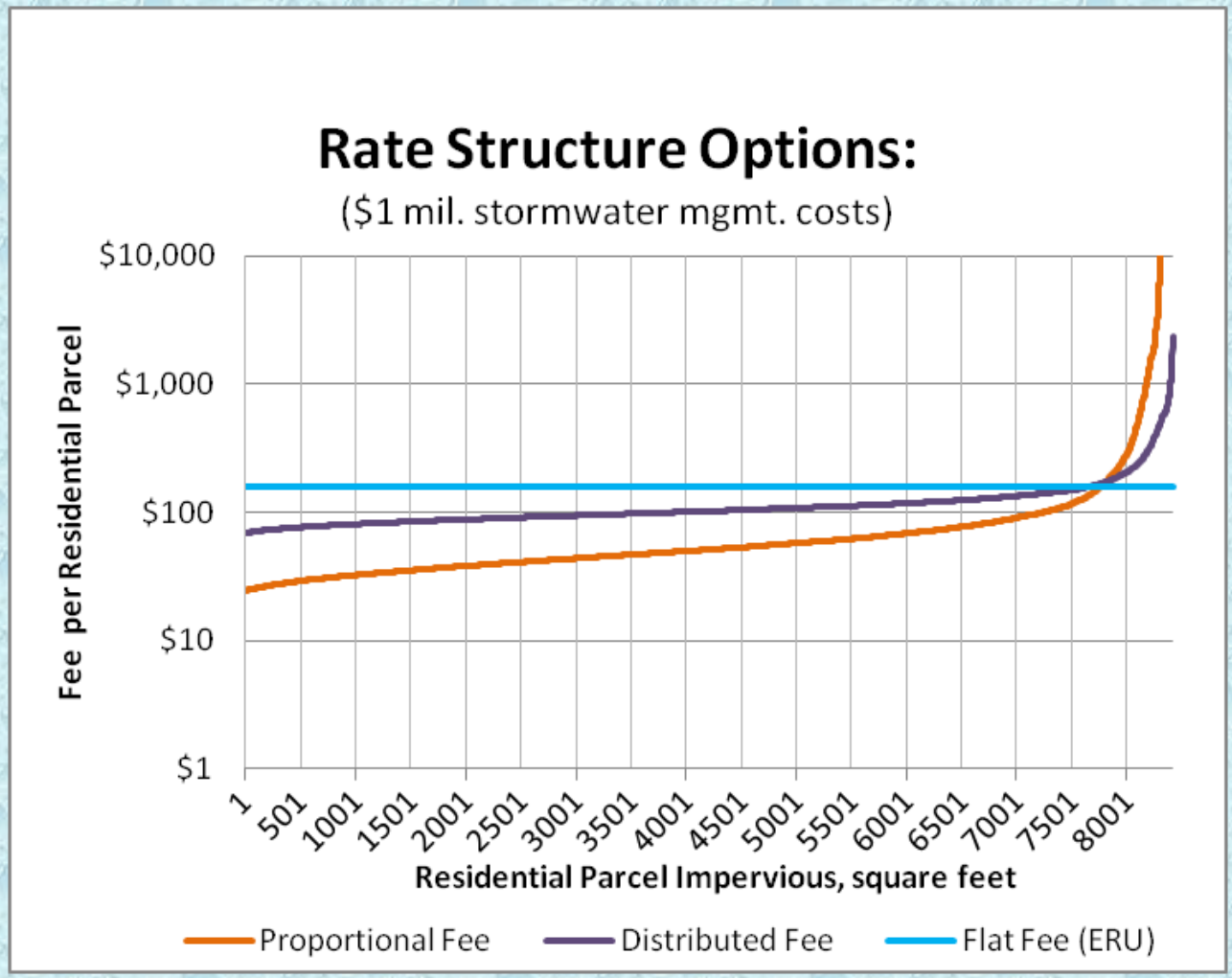
Property Type	# of Parcels	Total Imperv (sq ft)	Average Imperv.	ERU Equivalent	Annual Fee	Quarterly Fee
Res - Single Fam	6,578	16,733,888	2,544 sq ft	1	$160.63	$40.15
Res – Accessory	378	616,628	1,631 sq ft	0.6	$103.00	$25.75
Res – Multi-Unit	1,521	7,914,075	5,203 sq ft	2.0	$210.68	$52.67
Commercial	295	15,009,539	50,880 sq ft	20.0	$3,212.65	$803.16
Industrial	39	2,361,727	60,557 sq ft	23.8	$3,823.70	$955.92
Exempt	186	5,303,104	28,406 sq ft	11.2	$1,150.14	$287.54
Totals:	8,997	47,919,303				

Determine Fee: Proportionate (parcel-by-parcel)

Property Type	Land Use Code	Total Impervious (sq ft)	Percent of Town's Imperv.	Approximate Low Fee (Annual)	Approximate High Fee (Annual)
Res - Single Family	101	16,733,888	39%	$5	$2,000
Res - Other/Accessory	130-142	616,628	19%	$30	$9,000
Res – Multi-Unit	102-125	7,914,075	1%	$1	$600
Commercial	300-393	15,009,539	35%	$1	$30,000*
Industrial	400-452	2,361,727	6%	$20	$5,000
Exempt	900	5,283,445	11%	$1	$9,000
Totals:		47,919,303	100%		

* Note: Sizeable variation is due to approximately 10 properties with over 200,000 sq ft impervious.

Weighing options…



Determine Fee: Credits

- Recharge of, or Reduction in, Impervious Coverage
- Low Impact Site Design
- Green Infrastructure
- Quantifiable Stormwater Quality Benefit (e.g. Reduction of Peak Flow)
- Educational Programming (primary/secondary schools)

Deliver: Internal Outreach

- ✓ Education on SW Pollution
- ✓ Purpose and Benefits of Fee
- ✓ Rates Methodology
- ✓ Recommended Rates
- ✓ Coordination: SW Advisory Committee (??)
- ✓ Materials for External Outreach

Deliver: External Outreach

1. Pre-Education Phase (Setting Groundwork) What is Stormwater?
2. Program Development (What is a Fee?)
3. Education After Fee/Utility Establishment

Questions?

Resources:
http://www.mapc.org/Stormwater_Financing
http://www.epa.gov/region1/npdes/stormwater/MS4_MA.html

Contact:
Julie Conroy, AICP
jconroy@mapc.org

Fact Sheet Overview:

Summary of Parcel Data

	Number of Parcels	Average Impervious cover (sqft)	Total Impervious Cover (acres)
Residential	7,159	3,608	593
Commercial	542	64,930	808
Exempt	194	40,331	180

Fact Sheets – what's on them

Flat Rate:

	Flat Fee
All Parcels	$127

Proportionate Rate:

	25th Percentile	Median	75th Percentile	Maximum
Residential	$29	$39	$52	$13,772
Commercial	$113	$293	$980	$16,345
Exempt	$4	$66	$459	$31,191

Fact Sheets – what's on them

Hybrid Rate

	25th Percentile	Median	75th Percentile	Maximum
Residential	$52	$52	$52	$52
Commercial	$113	$293	$980	$16,345
Exempt	$4	$66	$459	$31,191

Tiered Rate

	Tier 1	Tier 2	Tier 3	Tier 4
Residential	$52	$52	$52	$52
All Other Parcels	$27	$139	$452	$2,758

Rate Exercise

Critical Questions...

- ***How do you want to distribute the fee burden across property types?*** For example, if the Town's commercial properties include more impervious surfaces, in total, than all other property types; perhaps this is where the fee burden is more heavily weighed.

- ***How do you want to distribute the fee within each property type?*** For example, does the Town want to use the same fee for each property within one property classification?

- ***Is there an interest in "leveling-out" the fee distribution within a property type?*** For example, are there political sensitivities of imposing a fee based on actual imperviousness in cases where some properties bear a very high burden for one reason or another?