

So You Want to Implement a Stormwater Fee?

How to Evaluate Stormwater Fee Options and Implement Them in Your Community
Jenkintown Library, January 18, 2018





The Pennsylvania Environmental Council (PEC) protects and restores the natural and built environments through innovation, collaboration, education and advocacy.

PEC believes in the value of partnerships with the private sector, government, communities and individuals to improve the quality of life for all Pennsylvanians.



PennFuture

- Is a statewide public interest membership organization
- Advocates for policies and legislation that protects our public health, our environment, and the economy
- Has offices in Philadelphia, Harrisburg, Pittsburgh, and Wilkes-Barre and serves as the Pennsylvania affiliate for the National Wildlife Federation
- Focuses on water, air, land conservation, and energy

Workshop Goal:

Build Familiarity with Fee Programs & Options

Objectives:

- Understand why we need stormwater management programs.
- Understand various ways to finance stormwater programs.
- Learn basic methods of calculating stormwater fees.
- Learn about fee program development steps including ordinance.

Natural vs. Urban Watersheds



- Rain soaks into the ground
- Trees soak up rainwater
- Rain hits rooftops, streets & parking lots, can't soak in, and runs off
- Runoff goes into the sewers

Development Impacts on Water Quantity



Flooding

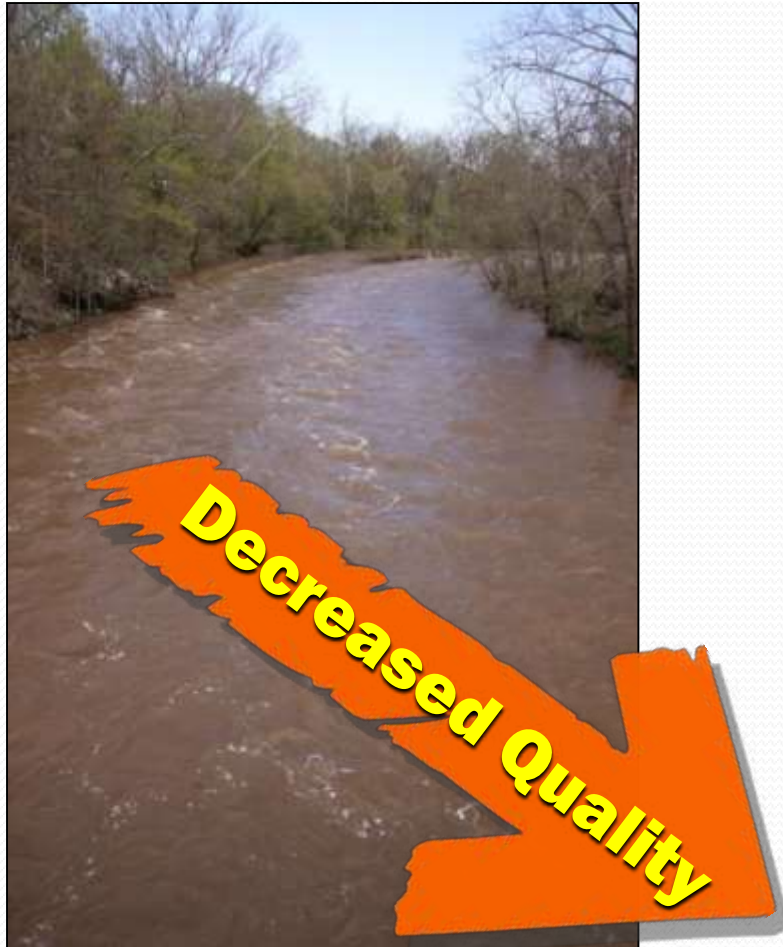


Erosion



Combined
Sewer
Overflow

Development Impacts on Water Quality



Decreased quality

Fertilizer Nutrients

- Phosphorous
- Nitrogen

Sediment

Pathogens

Organic Materials

Toxic Contaminants

Deicing Constituents (salt)

Debris

Thermal Stress

Municipal Separate Storm Sewer System (MS4) Permit Stormwater Plans Must:

- Contain measurable goals for the six Minimum Control Measures (MCMs)
- Contain Specific Activities to meet goals for each MCM
- Enact or implement either:
 - An MS4 Stormwater Management Ordinance
 - An ordinance that satisfies an MS4 Stormwater Management Ordinance Checklist
- Submit a **Total Maximum Daily Load Plan** if applicable
- New requirement: submit a **Pollutant Reduction Plan** for impaired waterways



Summary of Stormwater Management Needs

- **Stormwater Management**
 - driven by volume/flooding issues
- **MS4 Program**
 - Driven by water quality issues
 - TMDL and Pollutant Reduction Plan requirements



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Assess current stormwater program

Bring together stakeholders, and identify:

- Community sentiment
- Political landscape
- Capacity
- Regulated activities
- Local drivers
- Existing resources
- Existing relationships and partnerships
- Local champions/supporters (e.g. non-profits)

Ways to Fund Stormwater Programs

Multiple Sources

- General fund
- Bonds
- Grants
- Loans
- Fees
- Other

Multiple Budgets

- Public Works
- Streets
- Parks and Recreation
- Engineering
- Community Development
- Planning
- Other



Evaluating Stormwater Finance Needs

1. What are your stormwater management needs?
2. What are your current and future costs ?
3. What are your current revenue streams?
4. How much do you need?
5. How do you get it; potential funding sources?

1 - Stormwater Management Needs?



Flood Control



Upgrade and Maintain Infrastructure



Property impacts/ Reduce Erosion

2 - Current and future costs?



Permit New Development



Inspection/Maintenance

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) ANNUAL/PROGRESS REPORT

For the Reporting Period: to

☐ Annual Report ☐ Progress Report ☐ Due Date:
☐ New Permittee ☐ Renewal Permittee

Regulatory Compliance

3-Current revenue streams?



General fund – taxes

Capital budgets - taxes

Dedicated water and sewer funds - fees

Grants

4-How Much More Do You Need?

A very simplified accounting formula!

- $(\text{Total Projected Costs}) - (\text{Current Revenue}) = (\text{What You Need})$
- Timing
 - Annual
 - Over 5 year permit cycle
 - 20 to 25 year compliance period

LABOR

% FTE of existing staff
Hire additional staff
Contractors

OPERATIONS & MAINTENANCE

Software
Supplies
Equipment maintenance

CAPITAL

Equipment
Project identification
Land acquisition

From Environmental Finance Center

Develop a financing strategy to support budget

- Identify appropriate funding sources for budget items
- Consider affordability, other costs, ability to raise fees

GENERAL FUND

- Staff
- Engineering
- Monitoring
- Asset management
- Training and technology

GRANT

- Demo projects
- Initial SW mgr support

Partnership

- Education and outreach
- GIS services
- Volunteers

Fee System

- Projects
- Long-term SW mgr support
- O&M

Costs of Inaction



Fort Washington - Bob Raines -Ambler Gazette 2009



Hatboro from Hatboro Patch 2012

- Public Health and Safety Impacts
- Increased Flooding
- Increased Repair Costs
- Increased Water Pollution
- Decreased Recreational Opportunities
- Potential Lawsuits due to Increased Flooding
- Accelerated deterioration (and repair costs) of roadways
- Regulatory enforcement

City of Nashua Stormwater Funding
Feasibility Study

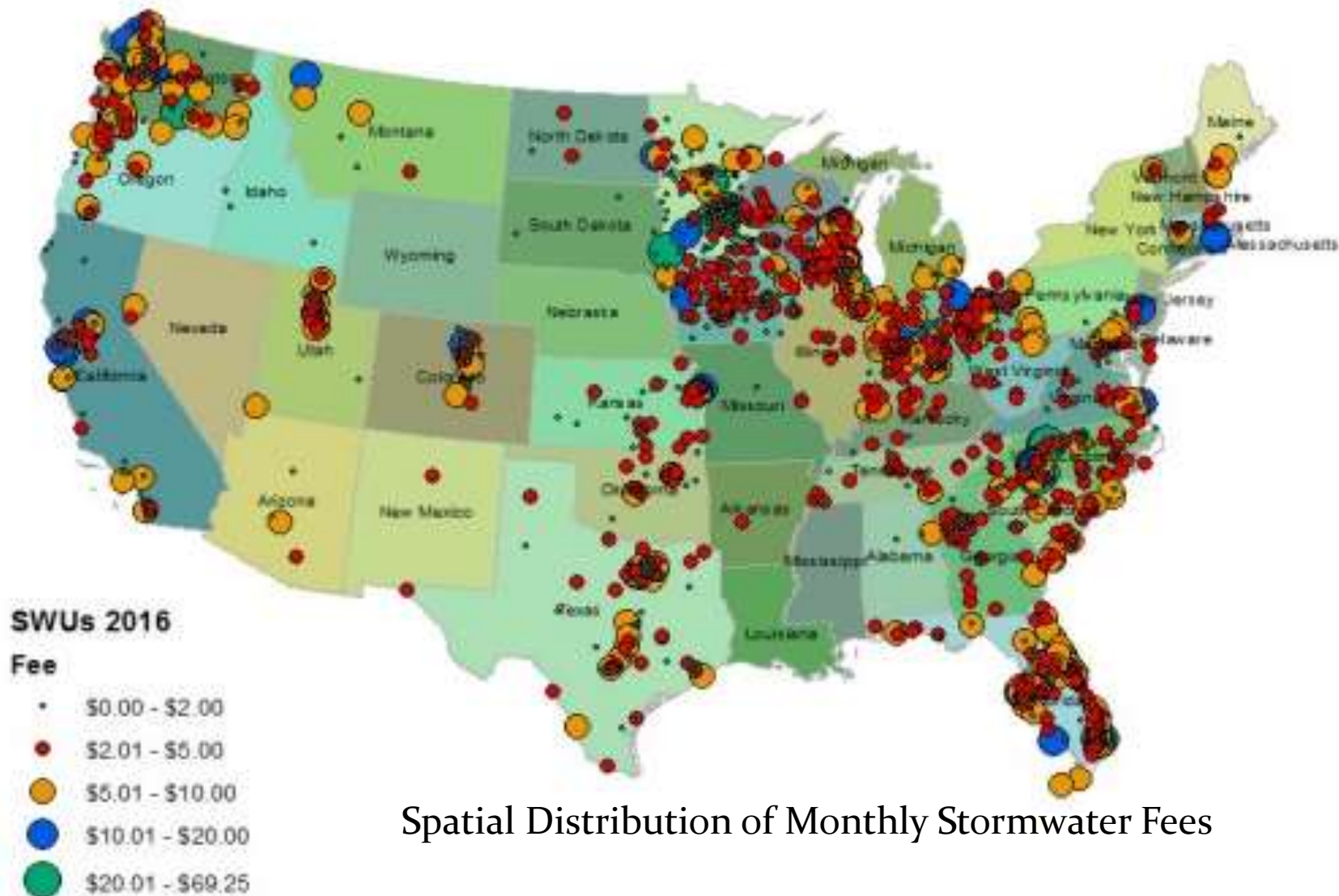
5-Potential Sources of Funding?

- General fund
- Bonds
- Grants
- Loans
- Fees
- Other

Eight Pennsylvania Municipalities have Fee Programs

Western Kentucky University Stormwater Utility Survey 2016

SWU Fees 2016



Spatial Distribution of Monthly Stormwater Fees

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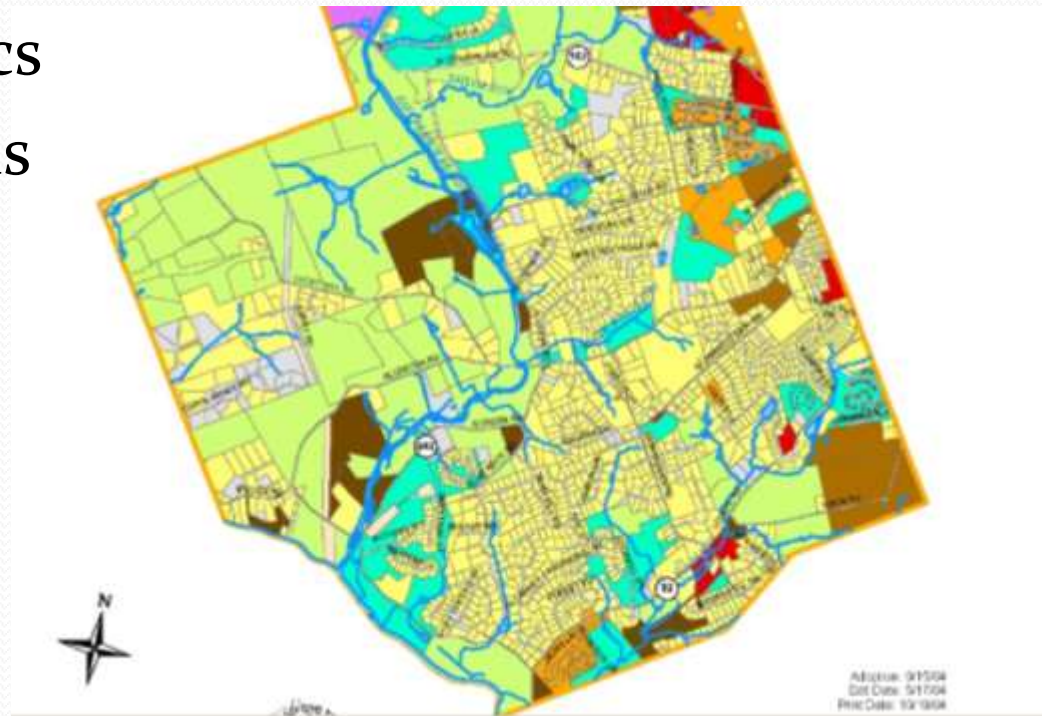
Why Focus on Fees?



- **Based on actual costs/revenues**
- **Predicable \$ stream**
- **Applies to all properties**
- **Based on your land use characteristics**
- **Based on impact to environment**
- **More equitable**
- **Dedicated to stormwater**
- **Controlled by municipality**

Technical Considerations

- Land use characteristics
- Pervious vs. impervious
- Hydrology and soils



Options for Calculating Stormwater Fees

LOTS OF ACRONYMS!!

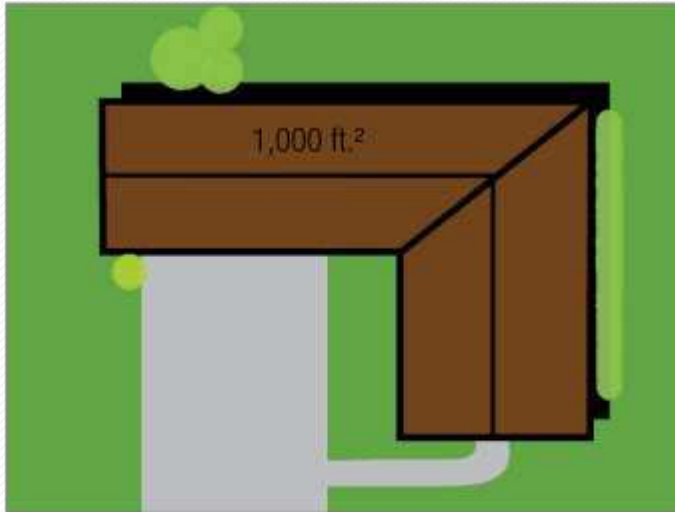
- Equivalent Residential Unit (ERU)
- Residential Tier System (RTS)
- Intensity Development Factor (IDF)
- Equivalent Hydraulic Area (EHA)
- Residential Equivalent Factor (REF)

Credit Systems and Equity

- Base fee for impervious surface typical approach
 - You pave you pay
- Fee system requires credit program
 - Install green stormwater infrastructure to reduce fee
- Consider equity:
 - Variety of housing sizes
 - Small/large lot credit options
 - Low income areas

Equivalent Residential Unit (ERU)

$$\text{Stormwater Fee} = \text{ERU} * \text{Standard 1.0 ERU Rate}$$



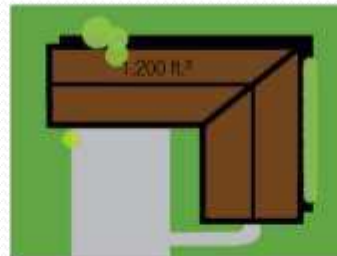
1 ERU = 1,000 ft.² of impervious area

The municipality will set a standard for impervious area and equate it to one equivalent residential unit. From this number, the municipality will be able to assess each parcel and determine the fee. For this example, we will assume that
1 ERU = \$1.00 stormwater utility fee.

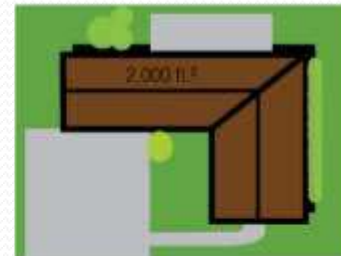
Advantages: The relationship between impervious area and stormwater impact is relatively easy to explain to the public - you pave, you pay.



.80 ERU = 800 ft.² of impervious area
.80 cents



1.2 ERU = 1,200 ft.² of impervious area
\$1.20



2.0 ERU = 2,000 ft.² of impervious area
\$2.00

ERU Advantages/Disadvantages

Advantages

- Easy to explain – you pave, you pay
- Just need to know impervious area/save time.

Disadvantages

- Runoff from pervious areas not considered
- Vacant properties with no impervious cover don't get charged

Examples in PA

- Meadville and Mount Lebanon

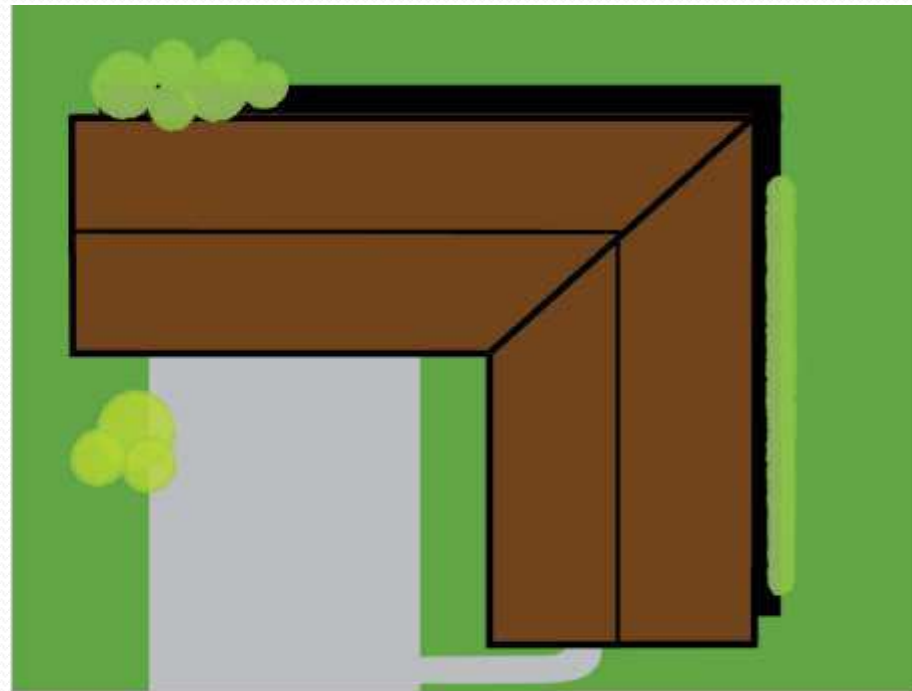
Residential Tier System (RTS)

Stormwater Fee (Residential) = $ERU * \text{Average ERU Rate @ Tier Level } n$, where n denotes the size category of the lot

Stormwater Fee (Non Residential) = $ERU * \text{Standard 1.0 ERU Rate}$



Tier 1: Small Residential



Tier 3: Large Residential

Residential Tier System (RTS)

Requires data/analysis of housing stock/land use

SWMAAC
Recommendation

Six “tiers” based on amount of impervious area.
A property’s tier determines the monthly charge.



Tier	Amount of Square Feet of Impervious Area	Percent of Total Accounts
Tier 1	>0 and <=1,000 sf	18%
Tier 2	>1,000 and <=1,500 sf	17%
Tier 3	>1,500 and <=2,000 sf	16%
Tier 4	>2,000 and <=2,500 sf	14%
Tier 5	>2,500 and <=3,000 sf	9%
Tier 6	>3,000 sf	26%

- Each Tier is charged based on the recommended monthly fee of \$6.70/1,000 ft² of Impervious Area using the midpoint of the range
- Median Monthly Fee:**
 - Residential: \$11.73
 - Commercial: \$25.87

RTS Advantages/Disadvantages

Advantages

- Fee customized to lot size
- May attract more political support
- Easy to understand and administer
- Requires less precise impervious surface mapping – time and cost savings.

Disadvantages

- Maximum “ceiling” size for non-residential properties may limit/reduce revenue.
- Residences may feel they are subsidizing large commercial users.

PA Examples

- City of Lancaster, Radnor, and Borough of West Chester

Intensity Development Factor (IDF)

$$\text{Stormwater Fee} = (\text{ERU} * \text{Standard 1.0 ERU Rate}) + (\text{IDF} * \text{Standard 1.0 IRU Rate})$$
$$\text{ERU} = (\text{Parcel Impervious Cover} / \text{Avg. Residential Impervious Parcel})$$

IDF adds a land use component to the stormwater fee calculation
based on intensity of development:

More Precise
Addresses water quality



Undeveloped
IDF Factor: 0.2



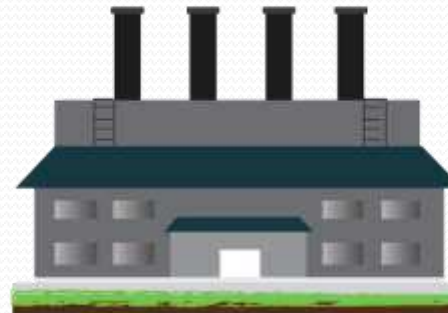
Low Density
IDF Factor: 0.5



Medium Density
IDF Factor: 1.0



**High Density/
Commercial**
IDF Factor: 1.5



Industrial
IDF Factor: 2.0

IDF Advantages/Disadvantages

Advantages

- Accounts for pervious portion of parcels; more precise

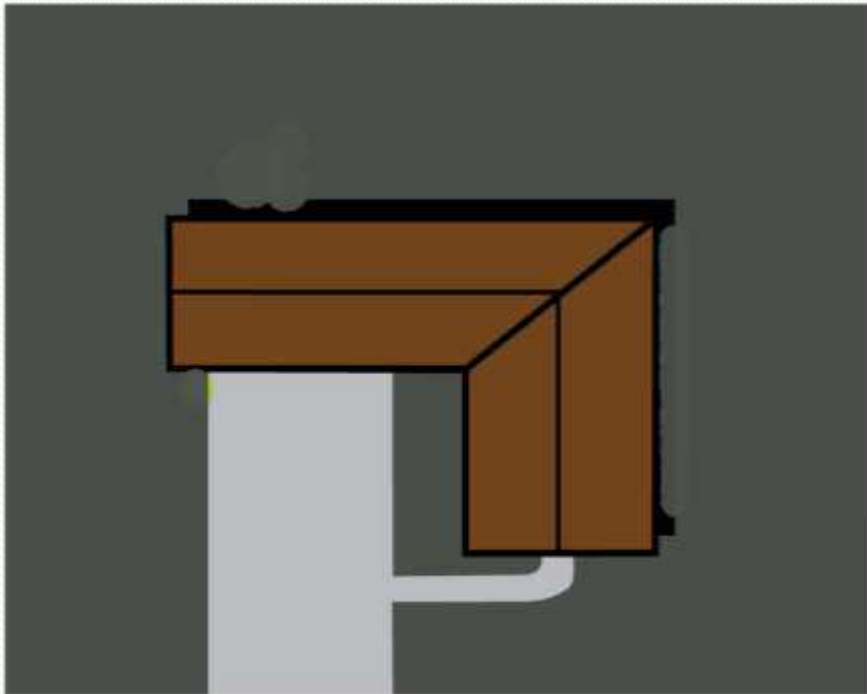
Disadvantages

- With broad IDF categories, parcels not billed in direct proportion to their relative stormwater discharges.
- Requires review of pervious and impervious areas
- More complicated to explain.

Equivalent Hydraulic Area (EHA)

Stormwater Fee = (*Impervious Rate * Parcel's Impervious Square Footage*) + (*Pervious Rate * Parcel's Pervious Square Footage*)

Step 1: Measure the impervious surface of a parcel.



Step 2: Measure the pervious surface of a parcel.



Step 3: Set a fee per sq. ft. for pervious and impervious. Multiply the individual parcels measurements by the standard rates to get the total cost for the parcel's stormwater fee.

EHA Advantages/Disadvantages

Advantages

- Accounts for both impervious and pervious areas; tied more precisely to runoff potential
- Parcels billed on the basis of individual measurements of both pervious and impervious areas.
- Fairer and more equitable

Disadvantages

- Requires more time to measure/determine billing units
- More complicated to explain.

PA Example

- Philadelphia

Residential Equivalent Factor (REF)

Big Science!

(Amount of runoff from a parcel)
(Runoff from a typical single
family residential property)

Residential Equivalent Factor (REF)

A Residential Equivalent Factor (REF) creates an equation to calculate runoff. One of the most widely accepted equation is the Natural Resources Conservation Service (NRCS) method of calculating runoff. The NRCS estimate of runoff (Q) in inches is given by the following equation.

$$Q = \frac{(P - I_a)^2}{P + 0.8 \cdot S}$$

P = rainfall (inches)

I_a = $0.2 \cdot S$ (inches)

$S = \frac{1000}{CN} - 10$ (inches)

CN = runoff curve number (dimensionless)

S is the probable maximum storage after runoff begins. I_a is the initial abstraction, the amount of rain that must fall before runoff begins. The runoff curve number CN depends on soil type and land use.

A Soils



D Soils



The NRCS divides soils up into four hydrologic soil groups: A, B, C, and D. Type A soils comprise of larger particles like sand or gravel so that rainfall soaks into the group (infiltrates) quickly in these soils. Type B soils have somewhat slower infiltration, C slower still, and type D soils, usually comprised of silts and clays have very slow infiltration so that more surface runoff occurs.

Runoff curve numbers range from 0-100. A curve number of 98 is appropriate for parking lots and streets. A curve number of 30 corresponds to brushy land in type A soils. The more hard surface a parcel has, the higher the curve number and the greater the runoff.

While calculating the average annual runoff is more tedious, it may be the fairest way to set up a REF system.

Advantages: The stormwater utility should set a price to what are the costs for its stormwater program. Then the monthly base fee for 1 REF should be divided between all land uses and by each month.

REF Advantages/Disadvantages

Advantages

- Scientific approach; looks at soils, rainfall, runoff potential
- Most precise and fair

Disadvantages

- Need to calculate rainfall standard for your area
- Scientific and heavy in calculations, takes more time
- Complex and harder to explain
- More data and information requirements

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Implementing an Authority

General Authority

- Stormwater Management Act, 32 Pa. Stat. § 680.1
- Municipal Planning Code, P.L. 805, No. 247

Create a Utility (an “Authority” in PA)

- Municipal Authorities Act 53 Pa. Stat. § 5607, allows for the creation of an authority that performs “storm water planning, management and implementation.”

Implementing a Fee Directly

2016 Legislative Session

- **HB1325 – Passed!** Allows **Second Class Township** to assess fees for stormwater management activities and facilities. (codified 53 Pa. Stat. § 67705)

2017 Legislative Session

- **HB913 and 914** – Amending the Borough and Incorporated Town Code to allow assessment of stormwater fees without creating an authority.
- **HB915** – Amending the 1st Class Township Code to allow assessment of stormwater fees without creating an authority.
- **HB916** – Amending the City Code to allow assessment of stormwater fees without creating an authority.

Fee Development Steps

- Feasibility Study
- Selection of Fee Method
- Public Education
 - Pre/post implementation
- Adopt Ordinance
- Create Billing System
- Provide Credits/Exemptions
- Develop O & M Program
- Prepare for legal challenges
- Implementation

Ordinance Sections

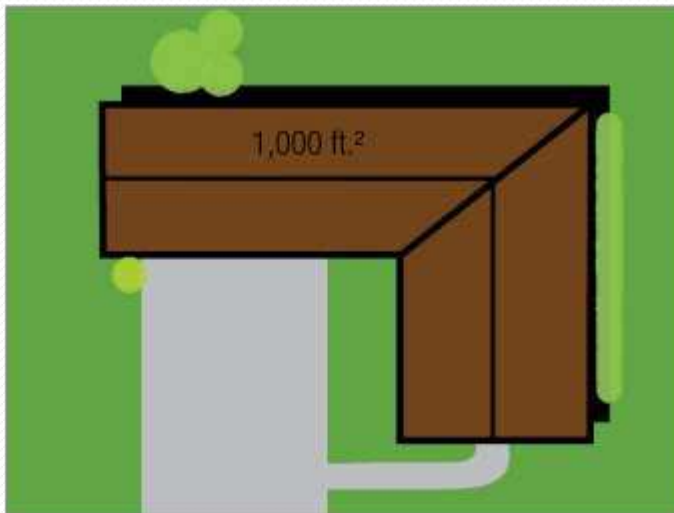
- Purpose
- Authority
- Findings
- Definitions
- Fee Calculation
- Credits available
- Account and Billing
- Enforcement and Penalties
- Review and Appeal

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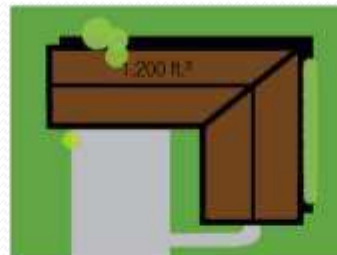
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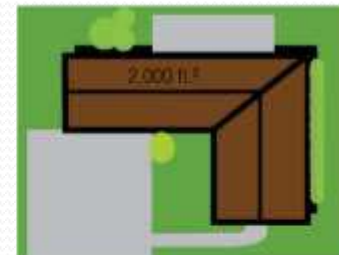
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Typically used to establish stormwater fee – built into draft ordinance.

Model Ordinance Cost

- one-, two-, and three-family residences are charged a the rate of 1 ERU



- All other properties have the stormwater fee assessed based upon the amount of impervious surface area located on the property

Ordinance Sections

- Purpose
- Authority
- Findings
- Definitions
- Fee Calculation
- **Credits available**
- Account and Billing
- Enforcement and Penalties
- Review and Appeal

Credits

The most effective way for owners of a property reduce the fee is to **reduce the amount of impervious surface** area on the property. Incentives to reducing runoff



Credits

Stormwater Management Practices:

- Stormwater BMP Manual
- Beyond the BMP Manual
 - Lot's assessed fee
 - Percentage of impervious surface from which the first 1.5 inches of stormwater is managed and
 - BMP's Credit Rate (as defined in the ordinance)
- Maximum credit of 80% of the fee that would be assessed to that lot in the absence of any credit.



Successful financing strategies are:

- Community-based
 - Local drivers and priorities
 - Local champions
- Integrated
 - A mix of financing mechanisms (cost reduction, revenue generators, incentives)
 - A mix of funding sources (fees/taxes)
 - Include rebates/credits
- Mirror the resource
 - Different stakeholders contribute in different ways



Tookany/Tacony-Frankford
Watershed Partnership, Inc.



Thank you!

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