Stormwater Fees:

Overview of Municipal Stormwater Fee Programs

July 2019 Update

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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.

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I. Overview

Stormwater management is a growing challenge for local governments. With the impact of past development on water quality and stream health, and federal and state permit requirements for new development and redevelopment, municipalities must implement approaches that protect and restore the water resources within their communities. To support these efforts, many municipalities are considering a dedicated funding stream to address flooding, water quality, and other concerns caused by unmanaged or poorly managed stormwater runoff.

The purpose of this handbook is to provide an overview of stormwater management fee programs. It describes how a stormwater fee program can be structured within your municipality, approaches for calculating fees, and a summary of stormwater fee development and implementation steps. For more information, please feel free to contact the Pennsylvania Environmental Council (PEC) or use the references provided in the back of this handbook.

What is stormwater?

Stormwater results from a rain storm or snow melt runoff. Higher volumes of precipitation cannot all be absorbed by plants and soils. Land covered by impervious surfaces such as roads, parking lots, and buildings also cannot absorb rain. Collectively, water that cannot be absorbed rushes to the municipality's storm water system and eventually into local creeks and streams.

Figure A *illustrates typical runoff occurring during a rain event in a residential neighborhood. Take note how more runoff occurs than infiltration.*

Why does it matter?

As stormwater travels to local creeks and streams, it picks up pollutants which degrade water quality. The pollutants found in the creeks and streams come from everyday items. From oil leaking from a car to pesticides used in a yard, these pollutants contribute to the degradation of water quality during storms. These impurities are referred to as non-point source pollutants, meaning pollution that results from runoff, precipitation, atmospheric deposition, drainage, seepage, or landscape modifications (U.S. EPA). High volumes of runoff also erode stream banks and deposit sediments that are damaging to aquatic life. Due to the variety of non-point sources, it is hard to pin point specific pollutants back to specific source(s).

In the case of combined sanitary and storm sewer systems, municipal water treatment facilities are unable to treat the increased flow to treatment plants. As a result the plants may have to redirect the flow of untreated waste water directly to local creeks and streams.

A stormwater fee can help a municipality address the collective impact of non-point source pollution caused by stormwater runoff.

What is a stormwater fee?

Municipalities in the past have relied on grants, loans and general funds to finance their stormwater programs. More recently, cities, townships, and boroughs are considering dedicated and stable sources of funding for stormwater programs including the formation of municipal stormwater authorities and/or the establishment of stormwater fees.

Municipalities across the country are establishing stormwater fees to fund stormwater management and associated non-point source pollution control programs. See Western Kentucky University Stormwater Utility Surveys report for summary of location and types of fee programs (https://www.wku.edu/seas/undergradprogramdescription/stormwaterutilitysurvey.php). Stormwater fees are typically levied on landowners based on the potential for their property to generate runoff (e.g. based on the size of the property and the amount of development on the property). The municipalities use money collected by fees to fund stormwater management projects and programs that reduce runoff and associated non-point source pollutants. One common stormwater management strategy is to install green infrastructure (e.g. rain gardens, naturalized basins, green roofs, and bioswales) that slow and infiltrate runoff to reduce pollution and mitigate flooding. Unlike general tax revenue, revenues generated via stormwater fees must be dedicated solely to stormwater management programs and projects.

The following information is provided to help guide your municipality's decision to assess and implement a stormwater fee program.

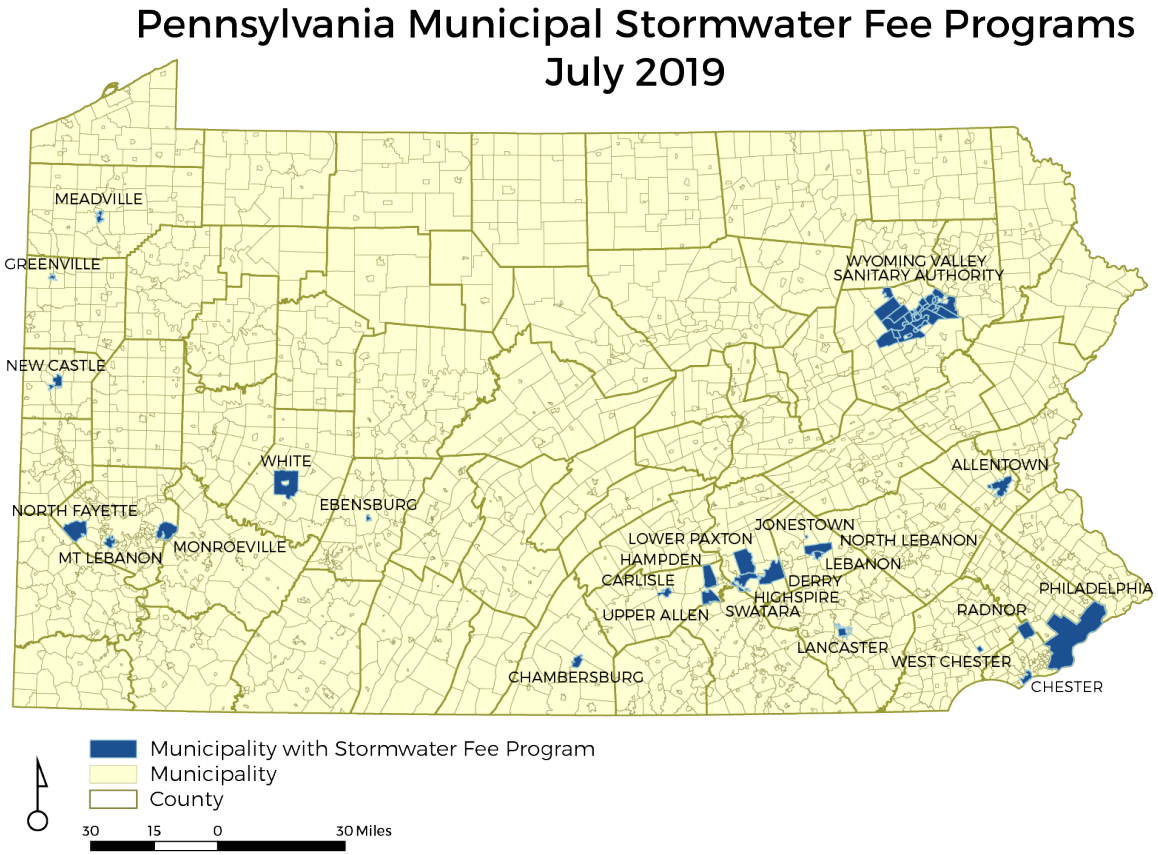
Pennsylvania Fee Programs

As noted in the Western Kentucky University Study, almost 1,700 stormwater utilities exist nationwide, in 40 states and the District of Columbia. To remove stumbling blocks to fee creation, the survey recommends that states develop clear statutory authority allowing for stormwater fee programs for all categories of governing jurisdictions.

Stakeholders in Pennsylvania have recognized the need for clarifying legislation allowing for the creation of both stormwater authorities and municipal stormwater fees. In 2013 and 2014 the State's Municipal Authorities Act was amended to allow for the creation of authorities that can collect fees to perform "storm water planning, management and implementation."

Additional legislation is being pursued that specifically enables townships, boroughs, and cities to create and assess stormwater fees without the need to form an authority. In 2016, legislation was passed permitting second class townships to assess reasonable and uniform fees for stormwater management activities and facilities. Similar legislation is being considered for other government entities such as boroughs, first class townships, and cities. Some municipalities with Home Rule Charters have already moved forward with stormwater fee programs.

As of July 2019, there are 26 Pennsylvania municipalities with stormwater fee programs, and several other municipalities have begun the process of developing a program. The following chapters provide some basic information to help guide your municipality's decision to create and implement a stormwater fee program.



II. Structure within Your Municipality

Setting up a stormwater fee requires a significant amount of time and resources. The following sections delve into different ways you can organize a stormwater authority or fee within your municipality.

Stormwater Authority

A stormwater authority is a separate government unit within one or more municipalities that can assess fees in order to develop and deliver stormwater management services. Pennsylvania's Municipality Authorities Act sets forth specific statutory power for municipalities to create a stormwater authority. The authority can generate fees that provide an operating revenue. The revenue from the authority is used to pay employees, operate and maintain stormwater facilities, fund green infrastructure projects and provide other related services. These dedicated stormwater authority fees cannot be diverted into the general operating budget. This can be a key selling point in setting up the authority; municipal officials can highlight flooding, erosion, and pollution problem areas and explain how the stormwater fee will be spent on programs and projects that directly address these community concerns.

It takes a great deal of thought and time to implement a stormwater authority. Many municipalities will have to restructure their water programs and hire more employees. It can be costly upfront with no initial revenue during feasibility assessment and start-up phases.

Water Department/Authority

Many municipalities in Pennsylvania already have a water department/authority within their government structure. A stormwater division can fit within the existing structure of a water department. However, additional employees may need to be hired to run the stormwater program effectively including setting up and implementing a stormwater fee program. In addition, the clarity of the revenue may become muddled within the organization. A new charge to residents will likely take some convincing. When billing to residents, it may be best to itemize the water bill showcasing the specific amount directed to stormwater management and related restoration programs.

Multiple Departments

Another option is that a municipality can pool personnel from several departments to help administer the stormwater program. The existing or new employees should have specialized stormwater management skills. However, their allocation of time may be distorted and may be spread thin between other projects in their specific departments and their new role implementing and managing the stormwater program.

Creating a Stormwater Management Position

If you feel your municipality is able to do so, you can create a stormwater position. This person would be in charge of running the stormwater management and associated fee program. No department would exist. This structure may work for a smaller municipality, but the stormwater position can easily get overwhelmed with implementation, monitoring, and financial management tasks.

All these organizational structures depend on what works best for your community. Residents may better understand one structure versus another. To make a decision of the stormwater structure, it is important to involve the public.

III. Stormwater Fee Calculation

Stormwater fees can be calculated several different ways. The following subsections discuss each calculation's methodology and its pros/cons. A stormwater fee calculation program can be chosen based on your community's resources, land use characteristics, and population preferences. Fee calculation methods were drawn from US EPA's Funding Stormwater document. For further information regarding fee calculation, visit (https://www.epa.gov/sites/production/files/2015-10/documents/fundingstormwater.pdf).

Equivalent Residential Unit (ERU)

An Equivalent Residential Unit (ERU) is a unit of measure used to equate non-residential or multi-family residential properties to a specific number of single-family residences. An ERU is usually the average impervious area on a single-family residential parcel, although some communities define it as the average of all residential parcels. The definition will depend on the housing stock of your community.

Municipalities can calculate ERUs fees two different ways for residential properties. Once an average impervious area is determined, a municipality may charge all residential parcels the standard 1.0 ERU rate. This tends to be inequitable. If you are a large impervious landowner, you benefit from the standard. In contrast, smaller parcel impervious landowners will pay more in comparison to their impervious land cover. To make the ERU accounting method more equitable, municipalities can calculate each resident's impervious area within their parcel. If their property has less impervious coverage, they will have a fee lower than the 1.0 ERU average. The opposite applies for large land owners. The money generated from each accounting system will total the same.

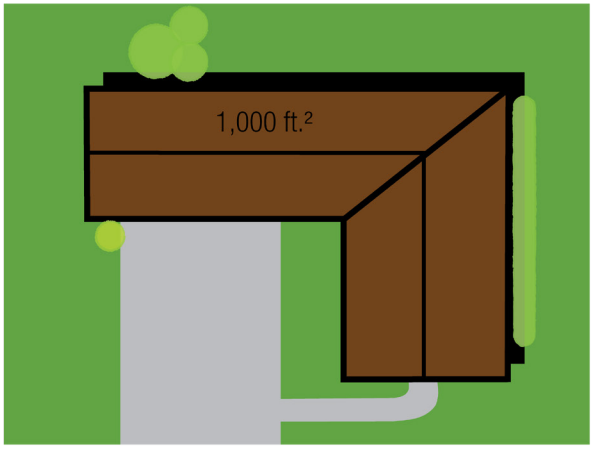
For multi-family and non-residential properties, the municipality calculates the impervious surface of each parcel. The impervious area will be compared to the average impervious surface of a residential property, the ERU. The fee will be charged based on the ratio.

Advantages

The relationship (or nexus) between impervious area and stormwater impact is relatively easy to explain to the public – you pave, you pay. The number of billable ERUs can be determined by limiting the parcel area review to impervious area only. Because pervious area analysis is not required, this approach requires the least amount of time to determine the total number of billing units.

Disadvantages

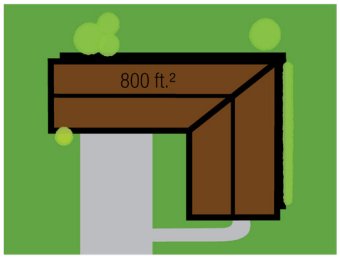
The potential effect of stormwater runoff from the pervious area of a parcel is not reviewed. Runoff still occurs on pervious surface, especially traditional lawn grass. In addition, this method is sometimes considered to be less equitable because runoff-related expenses are recovered from a smaller area base. Vacant properties with no impervious cover do not get charged under the ERU fee system.



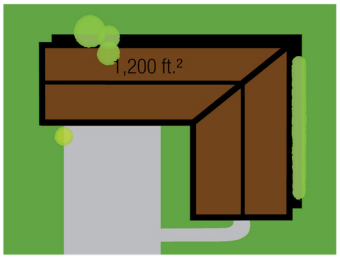
1 ERU = 1,000 ft.² of impervious area

The municipality will set a standard for impervious area and equate it to one equivalent residential unit. From this number, the muncipality 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.

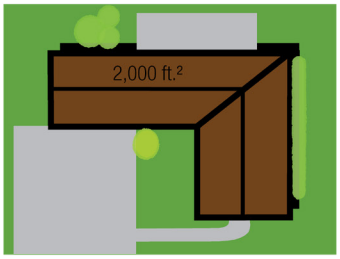
Advantages: The relationship between impervious area and stormwater impact is relatively easy to explain to the public - you pave, you pay.



.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 calculation includes all impervious surface (buildings, paved surfaces, etc.)

Residential Tier System

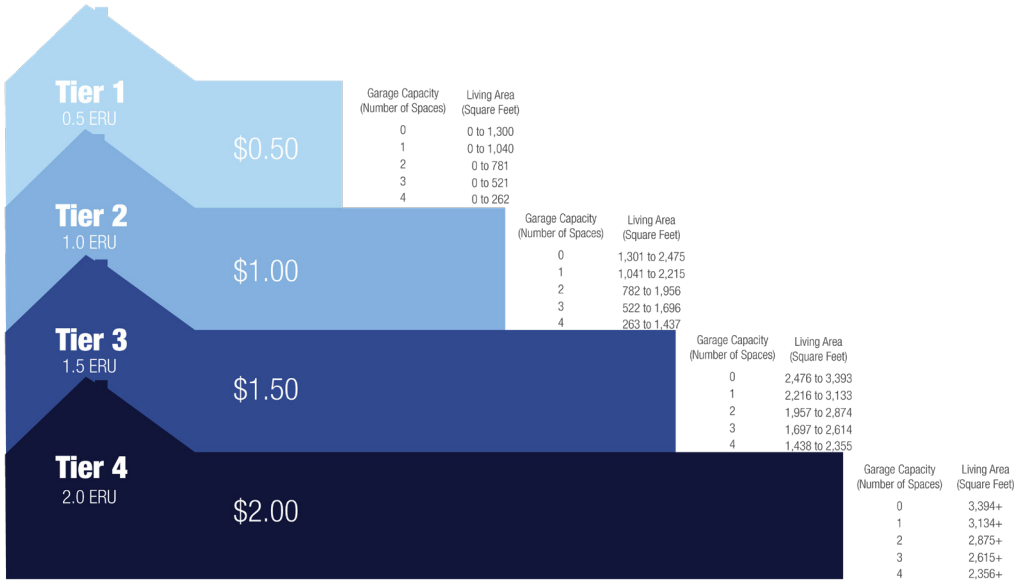
The tier system is an alternative to the ERU. It uses the same calculation method as ERU. The fees increase in steps, depending on whether the property falls within a particular impervious size range. A typical tiered approach creates small, medium, and large categories for single-family residential properties, charging a different fee for each class. The average impervious surface ERU would be considered within the medium classification. From the average, the tier system will establish a range for the small, medium, and large impervious parcels.

Advantages

Tiered residential fee offers more equity than a flat ERU rate based only on the average. It may buy more political support for the approach. A tiered-system is easy to understand and administer. Use of ranges requires less precise impervious surface mapping – providing time and cost savings.

Disadvantages

Tiered systems may be vulnerable to legal challenges. Residences may feel like they are subsidizing large commercial users. Setting a maximum "ceiling" size for non-residential properties may keep the revenue stream relatively low.



* For non-residential and multi-family (e.g. apartment complexes), the ERU calculation is used. Properties in these categories do not use the tier system. The standard residential impervious square footage, ERU, will be divided by the larger parcel impervious cover to determine their unique fee.

Intensity Development Factor (IDF)

Intensity of Development Factor (IDF) adds a land use component to the stormwater fee calculation. The stormwater cost allocation system is based on the percentage of impervious area relative to the entire parcel's size. All parcels, including vacant/ undeveloped parcels, are subject to a fee assessment. In addition to the ERU calculation, fees are based on their intensity of development, which is defined as a land use classification.

Stormwater Fee = (ERU*Standard 1.0 ERU Rate) + (IDF*Standard 1.0 ERU Rate)
ERU = (Parcel Impervious Cover/ Avg. Residential Impervious Parcel)

Advantages

The IDF method accounts for stormwater from the pervious portion of the parcels. Therefore, it can be more equitable than the ERU method. If a parcel's impervious area is increased slightly because of minor construction modification, it probably would not be bounced into the next higher IDF category. This reduces the time required for staff to maintain the billable unit master file.

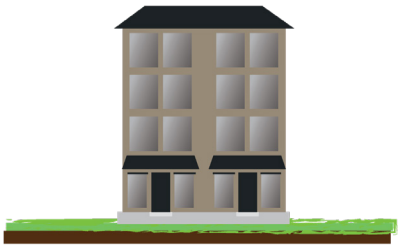
Disadvantages

The IDF categories are broad, and parcels are not billed in direct proportion to their relative stormwater discharges. This method can be more difficult to implement than the ERU method because parcel's pervious and impervious areas need to be reviewed. It is also more complicated to explain to customers than the ERU method. This method might discourage urban infill and inadvertently encourage sprawl.

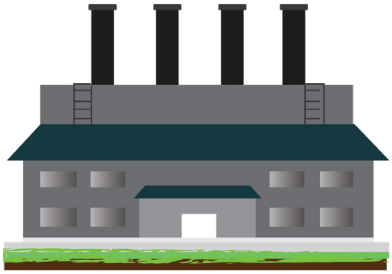
Undeveloped
IDF Factor: 0.2

Low Density
IDF Factor: 0.5

Medium Density
IDF Factor: 1.0



High Density/ Commercial
IDF Factor: 1.5



Industrial
IDF Factor: 2.0

Equivalent Hydraulic Area (EHA)

This fee method also accounts for pervious portions of the parcel (like the IDF fee). It is often considered fairer than the IDF method because parcels are billed on the basis of individual measurements of pervious and impervious surfaces rather than on a land use scale.

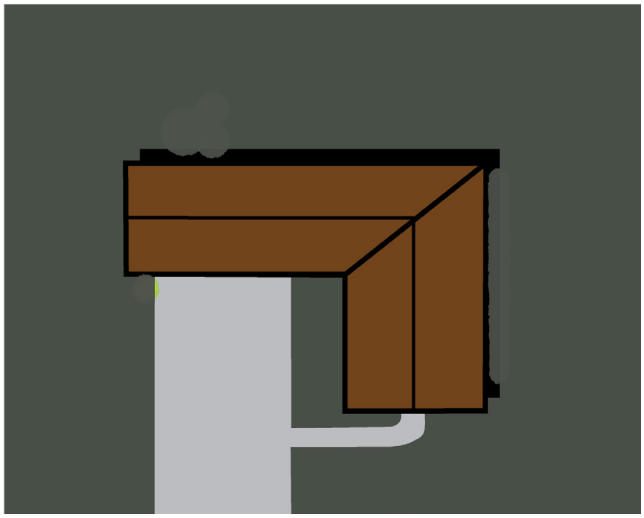
Advantages

The EHA method accounts for flow from the pervious portions of a parcel. Therefore, it might be more equitable than the ERU method. Like the IDF method, it accounts for undeveloped/vacant parcels and allows them to be billed, but it is fairer than the IDF method because parcels are billed on the basis of individual measurements of pervious and impervious areas.

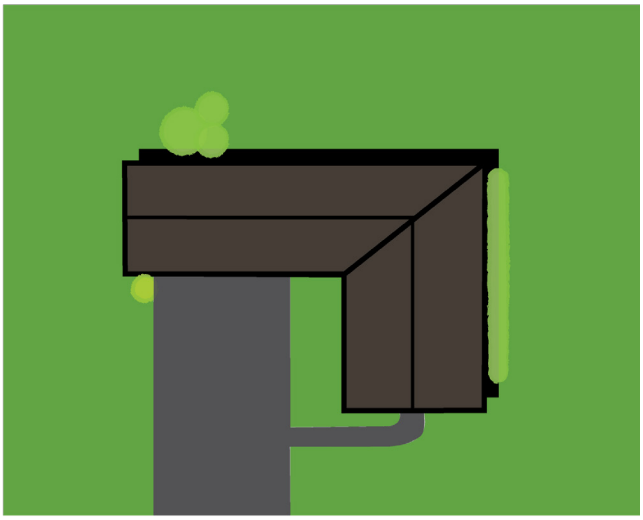
Disadvantages

Since the pervious area analysis is required in addition to impervious area, this approach requires more time to determine the total number of billing units. It is more complicated to explain to customers than the ERU method.

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.**

Residential Equivalent Factor (REF)

The Residential Equivalent Factor takes a scientific perspective on calculating a stormwater utility fee. The fee is based on the Natural Resources Conservation Service (NRCS) method of calculating runoff. In the equation, it calculates runoff (Q) in inches, taking into account how much the parcel can absorb and store water before and after runoff occurs. The potential for runoff (i.e. the runoff curve number [CN]) depends on the soil type and land use. The NRCS divides soil up into four hydrologic soil groups: A, B, C, and D (ranging from more water absorbent sands (Type A) to less water absorbent clays (Type D). The runoff curve numbers range from 0-100 in theory, but in practice range from 30-98. A curve number of 98 corresponds to parking lots and streets and 30 corresponds to bushy land in type A soil. The more hard surface a parcel has, the higher its curve number and the greater the runoff. For a detailed explanation of NRCS Calculation, visit http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf.

Advantages

The REF takes a scientific approach to stormwater fees. Due to its complexity and details, it thinks of everything that contributes to stormwater runoff. Its calculations are the most exact and most equitable to land owners within a municipality.

Disadvantages

An issue for the REF system is the rainfall amount to use. While calculating the average annual runoff is more tedious, it may be the fairest way to set up a REF system. Municipalities in Minnesota use the REF system to calculate stormwater fees. Minnesota municipalities use the 1-year (presumably 24-hour storm) to calculate runoff in a REF equation. However, you need to use the best rainfall standard for your municipality.

The REF is scientific and heavy in calculations. Due to its complexity, it may be harder to explain to the general population. In addition, the data and information required for the calculation is greater than the others. If the resources do not exist, you may want to consider using a simpler method that takes less time to calculate and implement.

IV. Development & Implementation

The stormwater utility should first evaluate and determine costs to implement and maintain its stormwater program. Some communities make the mistake of working in the other direction. They determine the fee that is politically feasible and collect as much as they can. Usually the amount is less than needed for the program. Expectations are not met and political resistance develops. This creates legal and political exposure for the utility. It is recommended to create a budget for the stormwater fee and then derive the price for each resident/landowner from the budget.

As a municipality, you need to assess the best choice based on feedback from your community. Prior to implementation, a municipality needs to develop and understand its stormwater system. Doing a feasibility assessment on a stormwater program will make for better understanding if charging a fee is appropriate for your municipality.

To better ascertain the community's choices, you must educate your municipal staff on financial options. Once employees understand and are on board with the financing mechanism, it is recommended that a steering committee of selected citizens be established. These citizens should exhibit an interest in solving stormwater pollution within your municipality. The committee and staff can collaboratively develop the fee system, create a public outreach and education program, and guide the adoption of an ordinance.

When implementing the stormwater utility fee, you can use the committee to test how well the proposed stormwater fee works for the community. By using a small sample of a municipality's population, the municipality can rule out potential errors within the fee system before a system-wide roll out.

V. References

https://www.epa.gov/sites/production/files/2015-10/documents/fundingstormwater.pdf

The United States Environmental Protection Agency outlines the different financing mechanisms to create a stormwater fee.

http://www.mapc.org/wp-content/uploads/2018/05/SW_financing-utility_kit_3-23-14_full.pdf

The Metropolitan Area Planning Council (MAPC) offers a stormwater financing kit for the Boston region. The kit guides municipalities on how to set up a fee from the government structure to implementation steps. MAPC is the regional planning agency serving the people who live and work in the 101 cities and towns of Metropolitan Boston. They work toward sound municipal management, sustainable land use, protection of natural resources, efficient and affordable transportation, a diverse housing stock, public safety, economic development, clean energy, healthy communities, an informed public, and equity and opportunity among people of all backgrounds.

https://www.wku.edu/seas/undergradprogramdescription/stormwaterutilitysurvey.php

Dr. C. Warren Campbell of Western Kentucky University releases annual information on stormwater utility fees. His research creates a catalog of fee systems through out the United States. If your municipality is interested in learning more about Residential Equivalent Factor or any other fees, contact Dr. Campbell for more information.

http://cityoflancasterpa.com/stormwater-management-0

The City of Lancaster is one of several municipalities in Pennsylvania with a stormwater fee. Their website outlines the stormwater fee structure, the ordinance to create a fee, and provides updates about their stormwater systems improvements through green and grey infrastructure.

http://www.downers.us/res/stormwater-management/stormwater-utility

The Village of Downers Grove in Illinois uses the tier system to calculate stormwater utility fees within its jurisdiction. Their website highlights how the fee is calculated in an approachable format for its citizens.

https://athensclarkecounty.com/1857/Fee-Calculation

Athens-Clark County is a consolidated city-county government. Their stormwater program uses the Intensity Development Factor for its fee calculation. To help their residents understand, they offered a detailed description of land use intensities.

https://www.youtube.com/watch?v=Ak-js9MPSMU

The City of Durham, NC uses an animated video to explains stormwater and the fee system to its general public. This form of engagement helps the general public understand the stormwater fee and what the funds go toward.