

STORMWATER FEE ANALYSIS



BACKGROUND

The Clean Water Act (CWA), passed in 1972, sought to create safe, fishable and swimmable waterways by implementing programs that require water quality improvements. These programs require treatment for municipal water and industrial wastewater. This includes permitting requirements for discharges from point sources into navigable waters and gives the Environmental Protection Agency (EPA) the authority to create programs that control sewage and other pollutants.

Stormwater was not explicitly addressed by the CWA in 1972. While some municipal storm sewers and industrial systems discharged their stormwater through point sources, stormwater was largely left unregulated until the passing of The Water Quality Act (WQA) of 1987. The WQA mandates the implementation of a national program that addresses stormwater runoff by permitting discharges from municipal separate storm sewer systems (MS4s). This is known as the National Pollutant Discharge Elimination System's (NPDES) stormwater program. Phase I regulated large and medium MS4s. Large MS4s are systems that served more than 250,000 people. Medium MS4s were systems that served populations between 100,000 and 249,999. Phase I also included the regulation of industrial stormwater operations. In 1999, Phase II was implemented and small MS4s (<100,000 but >10,000), those within metropolitan areas and those designated by permitting agencies, began to be regulated and permitted by the NPDES permit program.

MS4s are required to create, implement and enforce a stormwater management plan (SWMP). A SWMP is used to describe how the MS4 will reduce pollutants from its sewer system. For Phase II Small MS4s, the SWMP also addresses the six minimum control measures (MCMs). MCMs cover:

1. Public education and outreach
2. Public participation
3. Illicit discharge detection and elimination
4. Management of construction site runoff
5. Management of post construction site runoff
6. Good housekeeping in municipal operations¹

The increased regulations put into place by the WQA and the NPDES permitting program did not ensure a source of funding for the necessary improvements to municipalities' stormwater system. The completion of the regulatory requirements and the associated costs are left to local governments. The increased regulatory requirements coupled with declining and aging infrastructure led to a need for consistent funding sources.

In the United States, money for stormwater management typically comes from a municipality's general fund. This is a government fund that is not allotted for a special purpose and is traditionally made up from property tax revenues. The issue with stormwater funding from the general fund is that it can compete with other services that the municipality funds, such as police, fire or other emergency response services. Due to this competition, stormwater initiatives usually receive low priority, and funding can be unstable or inadequate. To combat this issue, municipalities can implement sustainable stormwater programs that rely on other funding mechanisms, such as: special assessments, development fees, impact fees, permits and inspection fees. One of the most effective ways to fund a stormwater program is through the use of stormwater fees. Revenues from stormwater fees are specifically dedicated to stormwater management operations and/or capital infrastructure.

¹<https://www3.epa.gov/region1/npdes/stormwater/ma/six-minimum-control-measures.pdf>

The need for dedicated stormwater programs to meet municipal regulatory requirements is growing. However, public resistance to taxes and fees can damage the success of a stormwater fee. In order to help municipalities navigate the challenges of implementing stormwater fees, this report provides basic information on the most common types of stormwater fees; advantages and disadvantages of each; examples of best management practices that can be used as incentives for fee reduction; and general guidelines to follow during stormwater fee development.

STORMWATER FEES

Stormwater fees can be broken into three categories – **flat**, **variable** and **development intensity**. Each comes with pros and cons. Formulas for calculating each fee can be found in [Appendix A](#). Ultimately, the goal of a stormwater fee is to meet the costs of cumulative service demands of the municipality. Stormwater fees are placed on all properties, regardless of tax-exemption (unless state or federal law dictates otherwise). A municipality should avoid creating special classes of exempt properties; all properties within the jurisdiction should be required to pay the fee.

➔ Flat Fee Structures

➔ Flat fees can be delivered in several forms. At their simplest, flat fees are a fixed rate that all customers pay. They can be broken out into separate fees depending on customer class – residential and non-residential. Flat fees can also be tiered if a location has diverse residential or non-residential stock.

+ Advantages

Flat fees are easy and the least costly to administer. They can be charged as an additional line item on a sewer and water bill. If charged separately, the charge can be sent out quarterly. The formula for establishing the flat fee is simple: the total cost needed divided by number of customers/property owners. A flat fee that is tiered can create a more equitable flat fee system.

- Disadvantages

Flat fees are seen as the most inequitable stormwater fee. Flat fees do not correlate to what a property will contribute to the stormwater system. The big box store with 450,000 square feet of impervious surface will pay the same fee as a small, undeveloped, residential lot. Charging on only water and sewer classes leaves out properties who are not connected to services, but still contributing to the stormwater system. Flat fees are typically more burdensome on residents. Residential customers pay up to 10 times more than they would under a variable rate.²

➔ Variable Rate Structures

- ➔ Variable rates, also known as equivalency unit rates, create units which are then assigned to each property. This can be viewed as a block charge similar to the rate structure of some drinking water systems. Water customers may be billed in increments of 1,000 gallons, or 100 cubic feet, rather than the precise number of units that they consume. In this case, rather than being charged by water usage, customers are charged by amount of impervious surface on the property. Municipalities can charge in square-foot increments (i.e. 100 ft², 500 ft², 1,000 ft², etc.), but, most commonly, a municipality will develop a specific unit for their needs known as an equivalent residential unit (ERU). ERUs can be calculated two different ways. First, take all single family residences' (SFRs) impervious surface area and divide by the total number of SFRs to produce a municipality average. The second method that can be used to establish an ERU is to find the median impervious surface size for SFRs.
- ➔ Once an ERU is established, non-residential properties' total impervious surface is divided by the ERU. For example, a municipality decides to base its ERU on the average SFR impervious surface area. The municipality deduces that 1 ERU = 3,000 ft². One ERU costs \$5.00. A non-residential property has 15,000 square feet of impervious surface, counting its building and parking lot (15,000/3,000 = 5 ERU). The total bill would be \$25.00 (5 ERU x \$5.00) per cycle. Typically, all SFRs are charged 1 ERU.

² Campbell, C.W. Western Kentucky University Stormwater Utility Survey 2016; Technical Report; Western Kentucky University: Bowling Green.

➔ **Variable Rate Structures**

+ Advantages

Variable rates focus on the amount of impervious surfaces that a property has and ties costs directly to that amount. Impervious (paved or roofed) areas are most closely tied to the amount of runoff from that property. The concept is fairly easy to explain to the public and is generally accepted as equitable. Most people are able to understand the hydrologic impact of impervious surfaces and the link to increased demand on the stormwater system. You pave, you pay.

- Disadvantages

Pervious (non-paved) areas of the property are not taken into consideration during this process. A large property that has a lot of pervious area and smaller property that has no pervious areas, but the same amount of impervious area, pay the same. Undeveloped properties do not pay into the stormwater system. Variable rates are more time intensive to develop. They require mapping of all properties' impervious surfaces and calculations for non-residential properties. This results in a greater financial cost upfront to develop variable rates compared to flat rates.

➔ **Intensity of Development (ID) Rate Structures**

- ➔ ID rate structures are typically seen as the most equitable rate structure for stormwater fees. ID is a stormwater cost allocation system that takes the total impervious surface of a parcel and then divides it by the total parcel area. That percentage places the property into a class of development. This method, like ERU, uses a block charge (i.e. 100 ft², 500 ft², 1,000 ft², etc.).
- ➔ Unlike ERU, the charge is placed on the entire property. As the development percentage increases, so does the costs per unit. Units are typically 1,000 square feet

Category (Impervious Percentage Range)	Rate Per Month <i>per 1,000 square feet</i> (all surfaces)
Vacant/Undeveloped (0%)	\$0.10
Light Development (1% to 20%)	\$0.15
Moderate Development (21% to 40%)	\$0.20
Heavy Development (41% to 60%)	\$0.25
Very Heavy Development (61% to 100%)	\$0.30

For example, using the table above, a 10,000 square foot property that is classified as moderate development would pay \$2.00 per billing cycle ($\$0.20 \times (10,000/1,000)$). A flat rate for residential properties can be determined, similar to the 1 ERU approach, by finding the average residential property or median residential property.

+ Advantages

ID is often seen as the most equitable rate structure due to its consideration of the entire property. Undeveloped and heavily developed properties will all pay under this cost allocation system. It takes into account gross area as well as impervious surfaces. The general public understands this methodology, because it's easy to grasp that both pervious and impervious surfaces have stormwater runoff. Since total property sizes are likely already known, typically, the only missing information for the calculation is impervious surface amounts.

- Disadvantages

If fees are too high, ID can lead to urban sprawl because property owners are not encouraged to fill in land with development. Developing an ID rate structure is time intensive, however, it can be

implemented in the same time frame as ERUs. If too many ID categories are created, the rate can become complex to manage. ID rates require mapping of all properties' impervious surfaces and calculations for non-residential properties. This results in a greater financial cost upfront to develop compared to flat rates.

FEE CREDITS AND DISCOUNTS

Some communities, in an effort to reduce strain on their stormwater systems, encourage development of private stormwater management by implementing a stormwater credit program. Stormwater credit programs encourage the use of best management practices (BMPs) in exchange for a reduced fee. Typically, there is a limit on the amount a bill can be reduced (i.e. 10%-50%). BMPs typically fall under three categories of green infrastructure:

1. Vegetative Development – bioswales and rain gardens
2. Storage Development – rain barrels and retention ponds
3. Infiltration Development – pervious pavers and filter strips

Although relatively uncommon, some communities allow credits if landowners provide BMP education to other landowners. For a comprehensive list of example credit and discount BMPs see [Appendix B](#).

GENERAL GUIDELINES

Feasibility Study

In order to create a fee system that will meet costs *and* be generally accepted by the public, a feasibility study should be performed to determine the costs of implementing a stormwater fee. This will allow the municipality to provide information on why the fee was selected, as well as explain the associated costs of implementing the fee. It will also ensure that the fee will meet the financial needs of the municipality.

Public Engagement

The public should be consulted throughout the process. The selected fee structure should make sense and fall within the community's ability and willingness to pay. It should be financially sound and legally sound. It should be simple enough to communicate, but robust enough to serve the community's needs. A database should be created for all properties. If using any fee structure besides flat, an appeals process should be created, as some mapping software may inaccurately measure impervious surface.

Public Education

Share with the public how a well-funded stormwater management program can reduce flooding, create opportunities for outdoor recreation, improve water quality, and help their municipality meet federal and state mandates. All properties should be sent a sample bill, or expected charge notification, so they have the opportunity to learn about and prepare for the upcoming additional charges. Develop a process that allows users to communicate concerns, and be sure to communicate before, during and after the fee roll-out through mailers, social media, traditional print sources and community meetings.

Strong Leadership

Ultimately, implementing a stormwater fee will take strong leadership by elected officials or other local officials. Public information should show the inadequacy of existing methods of funding a stormwater program. Show the costs associated with managing the stormwater system. Prepare to address the common pushback, "*a stormwater fee is a rain tax rather than a fee.*" The feasibility study should be sufficient proof that there is a service associated with the cost, establishing the legal requirements for a fee. SWMPs help identify where costs are being spent. Educating the public on MCMs also leads to increased awareness of regulatory mandates.

sample calculations for each fee type

APPENDIX A



➔ **Flat Fee**

$$1) \text{ MPF} = \frac{\text{MMR}}{(\text{Total Number of Parcels})}$$

➔ **Variable Fee**

$$1) \text{ ERU} = \frac{\text{SFR Impervious Area}}{(\text{Total Number of Parcels})}$$

$$2) \text{ Number of ERUs on Parcel} = \frac{\text{Parcel Impervious Area}}{\text{ERU Area}}$$

$$3) \text{ ERU Rate} = \frac{\text{MMR}}{(\text{Total Number of ERUs})}$$

$$4) \text{ MPF} = (\text{Number of Parcel ERUs}) \times (\text{ERU Rate})$$

➔ **Intensity of Development (ID)**

$$1) \text{ ID Tier} = \frac{\text{Parcel Impervious Area}}{\text{Total Parcel Area}}$$

$$2) \text{ Number of Units} = \frac{\text{Total Parcel Area}}{1000}$$

$$3) \text{ MPF} = (\text{Number of Units}) \times (\text{ID Tier Rate})$$

$$4) \text{ MMR} = (\text{Total ID Tier1 Units} \times \text{ID Tier1 Rate}) + (\text{Total ID Tier2 Units} \times \text{ID Tier2 Rate}) \dots$$

Equation Abbreviations

MMR = Monthly Municipal Revenue

MPF = Monthly Parcel Fee

ERU = Equivalent Residential Rate

SFR = Single Family Resident

APPENDIX B



Best Management Practice	<i>Stormwater Impact</i>	
	Volume Reduction	Water Quality Improvement
Vegetation		
Ponds	X	X
Swales	X	X
Green Roofs	X	X
Infiltration Trenches	X	X
Rain Gardens	X	X
Vegetated Swales	X	X
Storage		
Rain Barrels	X	
Ponds	X	
Infiltration		
Pervious Pavers	X	X
Filter Strips		X
Sand Filters		X