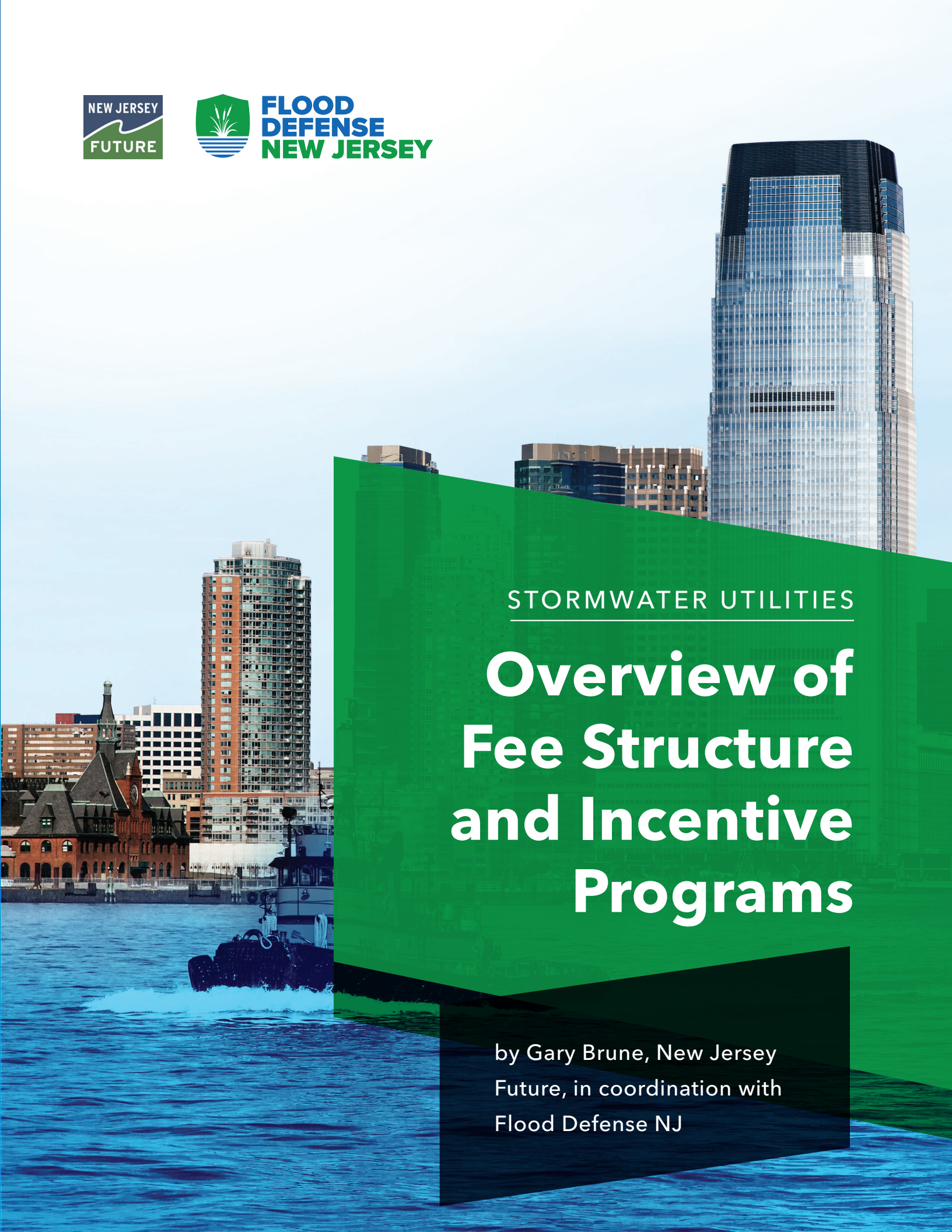

NEW JERSEY FUTURE

FLOOD DEFENSE NEW JERSEY

STORMWATER UTILITIES

Overview of Fee Structure and Incentive Programs

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This document provides a broad overview of the basic operation of stormwater utility programs, including background on typical fee structures used in other states. Information is provided on commonly-employed incentives and examples of stormwater fees in nearby jurisdictions.

BACKGROUND

As outlined in the diagram below, stormwater from rain and snowmelt generally does not go to a wastewater treatment plant, but rather is discharged into the nearest body of water. Depending on the locality, there are two types of stormwater systems: municipal separate systems (i.e., separate pipes for stormwater and sanitary flow) and combined sewer overflow systems. As stormwater flows over hardened, or impervious, surfaces such as driveways, parking lots, streets, and roofs, it accumulates debris, chemicals, sediment, and other pollutants that adversely affect water quality. Concentrating stormwater into straight channels and underground pipes increases its rate of flow, which often exacerbates local flooding. Finally, the combined sewer overflow systems found in older urban areas merge both stormwater and sanitary waste into one common pipe, which is often overwhelmed during strong storms. As a result, untreated wastewater bypasses the local treatment plant and is discharged directly into surrounding waterways, thus posing a health risk that may trigger federal and state regulatory penalties for non-compliance with water quality standards.

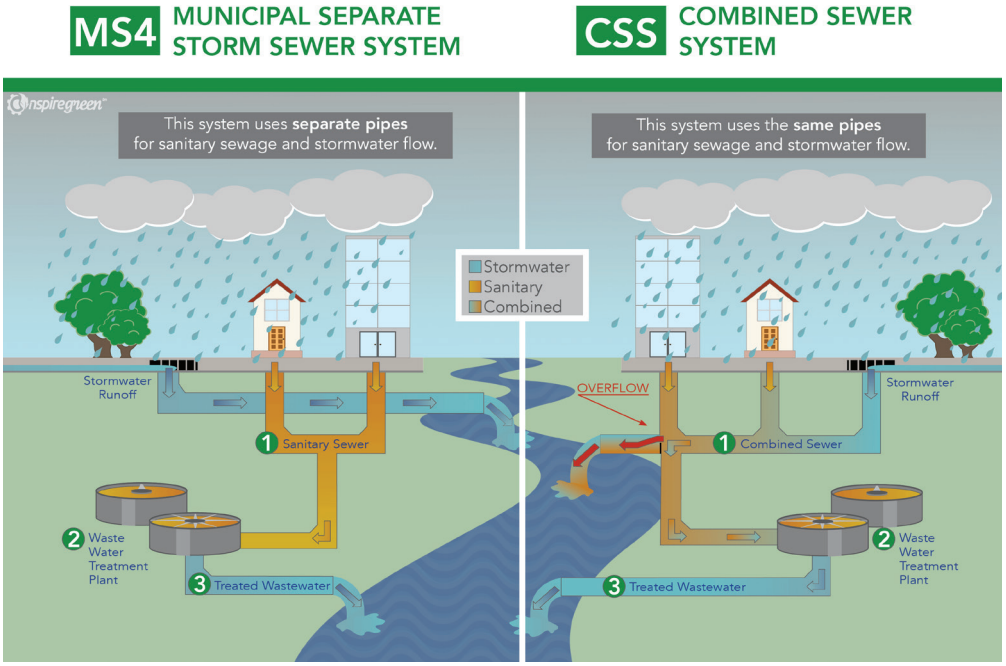

Image by: Nspiregreen, LLC for DOEE's Stormwater Plan Executive Summary

New Jersey communities manage rainfall with stormwater management systems that are regulated by state and federal laws. They fall into two categories: combined systems that can be found in 21 cities and separate systems that cover most of the rest of the state.

Historically, stormwater management has been the "organizational stepchild" to traditional sewer and water infrastructure programs. Unlike water and sewer utilities, which have dedicated revenue streams from user rates, stormwater needs often compete unsuccessfully for limited funds in strapped local budgets. Presently, stormwater investments are often made in response to failed infrastructure, a grossly inefficient practice that increases total cost and the risk to public safety.

On March 18, 2019, New Jersey became the 41st state to enact legislation, the Clean Stormwater and Flood Reduction Act (P.L. 2019, c.42), authorizing the creation of stormwater utilities by municipalities, counties or environmental authorities. The new law enables localities to charge a user fee to support improvements to stormwater systems that are often underfunded. Besides realizing important flood control and pollution prevention benefits, the most compelling factors are the growing stringency of environmental permits (e.g., new Municipal Separate Storm Sewer System, or MS4), system failures resulting from the sheer age of the existing infrastructure, and potential penalties due to non-compliance with federal and state regulations or consent decrees.

Stormwater utility revenue can address the following types of projects:

- Flood control measures
- Catch basin and culvert cleaning or rehabilitation
- Elimination of illicit discharges/connections
- MS4 permit compliance needs (i.e., avoid fines)
- Planned or emergency replacement of failing infrastructure (e.g., corrugated pipe)
- Combined sewer overflow (CSO) improvements (i.e., in communities with CSO facilities)
- Map/document sewerage inventories
- Public education

Fee revenue may also be used to pay debt service costs and to leverage State funds for capital improvements to the stormwater network.

STORMWATER FEE STRUCTURE

According to a stormwater utility survey[1] published by Black and Veatch Management Consulting in 2018, of the nearly 1,700 stormwater utilities that are currently operating nationwide, nearly 92 percent charge a user fee based at least in part on the amount of impervious cover. Impervious coverage information may be derived from a number of different sources, including aerial imagery (48 percent), building footprints reflected in local tax assessment systems (32 percent), and gross area with land use based runoff or intensity of use factors (10 percent).

As authorized in the Clean Stormwater and Flood Reduction Act (P.L. 2019, c.42), this particular feature is required in New Jersey. Specifically:

Section 8b: "Any fee or other charge that a county, municipality, or authority charges and collects pursuant to this section shall be based on a fair and equitable approximation of the proportionate contribution of stormwater runoff from a real property."

Stormwater fees can be charged as a flat fee, a tiered rate structure, or most commonly by Equivalent Residential Units (ERU), the latter of which reflects the average or median impervious area of a single family home in a given locality. The ERU is essentially a standard unit that can be applied to all properties. Typically, single family residences are presumed to have one ERU of impervious area and thus are charged a simple flat rate fee. Non-residential properties are commonly charged a fee per the number of ERUs that fit on their property. (Note: Properties that contain less than one ERU are often assessed at the rate of a full ERU. For properties with more than one ERU, but less than a full increment, the fee is often rounded to the nearest increment. For example, a property with 1.4 ERUs would be assessed a fee of 1.5 times the standard ERU rate.)

1 Black and Veatch Management Consulting, Inc., "2018 Stormwater Utility Survey", (2018)

Stormwater utility fees are typically determined by calculating two basic measures:

1. An "equivalent residential unit" or ERU, which represents a standard unit that can be applied to all properties and used for billing purposes, and;
2. A base rate, typically determined by dividing a locality's total anticipated expenses for stormwater-related work by its total ERUs.

To set the total fee on a given property, the base rate is multiplied by the number of ERUs.

As mentioned, there are three variations on this theme. In most municipalities, the residential fee is simply set at the value of a single ERU of impervious area, essentially yielding a flat (i.e., uniform) fee for all residences. Historically, many communities adopted this approach either because they did not possess data on the extent of their impervious area or faced steep costs to develop it for residential properties. Instead, an average area of impervious coverage was derived from a representative sampling of residences. The uniform flat fee based on a single ERU offered a simplified and cost effective solution for residential properties. (In such an approach, the fee for non-residential properties is often calculated by multiplying the base rate by the number of ERUs on the parcel.)

As a second alternative, the use of a tiered rate structure typically requires communities to have impervious assessment data for all residential properties. Each property is assigned to one of the tiers based on the extent of its impervious area. As the amount of impervious coverage increases, so does the associated fee. The ERU serves as the billing unit, and the fee often appears as a line item on the normal water and sewer bill. In the example below from the City of Lancaster, PA, the tiered fee is applied to all types of properties:

Impervious Area (Sq Ft)	Tier	Quarterly Fee
0 – 300	0	No Fee
301 – 1,000	1	$ 6.50
1,001 – 2,000	2	$19.50
2,001 – 3,000	3	$32.50
3,001 – or more	4	Impervious Cover x Base Rate

Some of the negatives of this approach include increased data maintenance needs and potentially increased customer appeals.

As opposed to other potential funding mechanisms, such as property tax, the user fee directly relates to the stormwater generated by a given property, thus incentivizing the owner to consider control measures that reduce stormwater runoff. Most utilities offer partial fee credits to encourage stormwater mitigation measures, often in the form of green infrastructure that mimics the natural water cycle by reducing and treating stormwater at its source. The Clean Stormwater and Flood Reduction Act requires stormwater utilities to offer such credits.

SETTING STORMWATER FEES–KEY FACTORS

Stormwater fees are set by local governments and vary tremendously. When comparing fees in different states and cities, it is important to keep the following in mind:

Fully Allocated Cost

Many cities do not reflect the full cost of stormwater capital and services in their rate base. To the degree that property tax revenue continues to fund certain costs, the public may not grasp the full magnitude of the problem. Proper comparisons of fees across jurisdictions require a case-by-case review.

Combined Sewer Overflow

Many older cities, and particularly those in the northeast, have combined sewer systems. These facilities are subject to government-required upgrades that are major cost drivers. Since the cost of required services is the key factor in determining the fee rate, this needs to be considered when comparing fee structures and average annual payments.

Some other vital fee-related factors to consider:

Equity

Stormwater utility fees ensure that the cost of infrastructure upgrades and services extends to a larger rate base. Typically, these fees are applied to non-metered properties (e.g., parking lots), that would not otherwise pay for water or sewer, as well as tax-exempt properties (e.g., universities, churches, and hospitals) that do not pay property taxes. Requiring property owners to pay based on the stormwater runoff generated by their parcel effectively spreads the cost across all contributors.

Fee/Cost of Service

Unlike a tax, a fee must directly correspond to the cost of the service provided. When set in combination with the Equivalent Residential Unit noted below, this ensures a system that is fair and proportional to a property's contribution to stormwater runoff.

Equivalent Residential Unit (ERU)

Typically, stormwater fees are based on an equivalent residential unit reflecting the average or median impervious area of a single family home. The ERU is essentially a standard unit that can be applied to all properties. Here is an example of how the ERU might be set for a given locality:

$$\text{ERU} = \frac{\text{Total Residential Impervious Area}}{\text{Total Dwelling Units}}$$

$$\frac{\text{40,000,000 Total Impervious Sq. Ft.}}{\text{18,407 Total Dwelling Units}}$$

ERU = 2,173 Sq. Ft

Base Fee Rate

The base fee rate (which is multiplied by the ERUs to generate the amount due) is set by dividing total anticipated annual stormwater expenses by the town's total ERUs.

$$\text{Base Rate} = \frac{\text{Total Anticipated Expenses}}{\text{Total ERUs in Locality}}$$

Here is one example of how a typical fee would be calculated:

Non-Residential Example

Building Footprint	10,000 sq ft
Parking Lot	14,000
Total Impervious Area	24,000 sq ft

Assume ERU = 3,000 sq ft:

Total = 24,000/3,000 sq ft	8 ERUs
ERU Monthly Rate	x $4
Monthly Charge	$32

Exemptions

The issuance of fee exemptions (e.g., religious and nonprofit organizations and government facilities) weakens the argument that "all runoff is created equal" and therefore should be discouraged. (Note: Other than a single exemption for agricultural and horticultural land, New Jersey's Clean Stormwater and Flood Reduction Act does not authorize fee exemptions.)

SAMPLE STORMWATER FEES

KEY POINTS

The following tables summarize samples of stormwater fees in small, medium, and large jurisdictions outside of New Jersey. The sample includes localities with varying degrees of combined sewer overflow (CSO) facilities as they are a key cost driver for stormwater controls. Major conclusions include:

- Fees vary tremendously nationwide, but are generally lower in small towns and higher in larger localities and those with CSO facilities.
- Most localities offer credits but outright exemptions are few and far between.
- Impervious cover is typically used as the basis for applying fees.
- The Equivalent Residential Unit (ERU) is used by most towns as a common measuring stick for assessing fees across different properties. One national study (Black and Veatch's 2018 Stormwater Utility Survey) pegs the median ERU at 2,618 square feet (sq ft) and reflects considerable variation (i.e., from a minimum of 910 sq ft to a maximum of 5,700 sq ft.)

Stormwater Fee Survey—Program Characteristics (Table 1)

- Summary level information of towns with/without combined sewers
- Most jurisdictions are in neighboring states
- Includes two smaller cities in PA whose population is consistent with the average population of NJ municipalities (15,000)
- Philadelphia's fee structure fundamentally different from the others

Stormwater Fee Comparison (Table 2)

- Main point is to estimate monthly and annual fee charges for all of the jurisdictions listed for the following scenarios, reflecting both small, medium, and large non-residential properties:
  - 1,000 sq ft of impervious cover
  - 3,000 sq ft of impervious cover
  - 7,000 sq ft of impervious cover
  - 20,000 sq ft of impervious cover

- Fees are markedly higher in Philadelphia, which has the highest population and percentage of combined sewers. Despite significant difference in population, fees in Rockville and Baltimore track similarly, particularly for larger properties.
- The results for the two smaller PA towns (Meadville and White Township) are generally lower than other jurisdictions with higher populations yet there are marked differences between the two. (See mini case study summary later in this paper.)
- Populations of Lancaster and Rockville approximate that of mid-sized towns in NJ (e.g., Bayonne).
- Column headers for Philadelphia's stormwater fee, which is based on both gross area and impervious area, are unique from the rest.
- Lancaster, PA indicates that it's experience with the business community was mostly positive and is seemingly the best case study in that regard. (See attached case study summary.)

Table 1: STORMWATER FEE SURVEY–PROGRAM CHARACTERISTICS

- Across nearly 1,700 stormwater utilities nationwide, average population = 69,300. (Source: Western Kentucky University Stormwater Utility Survey, 2018)
- In New Jersey:
  - Approximate average population across all towns = 15,000.
  - Approximate average population of NJ's ten largest cities = 127,000.

	Population (thousand)	Combined Sewer	Utility Implemented	Use of Credits	Fee Basis	Tiered/ Graduated Fee	Exemptions
Wilmington, DE	71.0	95%	2007	Yes	Gross Area x Runoff Coefficient = (Impervious Cover/ERU) x Rate	No	No
Philadelphia, PA	1.6	60%	2012	Yes	Gross Area and Impervious Area	No	No
Lancaster, PA	59.0	45%	2014	Yes	Impervious Cover / ERU x Rate	Yes (4 Tiers)	No
Baltimore, MD	622.0	0%	2013	Yes	Impervious Cover / ERU x Rate	Yes Residential (3)	Charitable/Nonprofit–hardship State and local Residents–based on income
Rockville, MD	67.0	0%	2008	Yes	Impervious Cover / ERU x Rate	No	No
Gwinnett County, GA	667.0	0%	2006	Yes	Impervious Cover / ERU x Rate	No	No
Meadville, PA	13.6	0%	2012	No	Impervious Cover / ERU x Rate	No	No
White Township, PA	15.8	0%	2015	No	Impervious Cover / ERU x Rate	No	No

ERU = Equivalent Residential Unit, reflecting impervious area of the average or median single family property.

TABLE 2: STORMWATER FEE COMPARISON

	SAMPLE PROPERTIES (SQ FT)			
	Gross Area = 3,000	**Gross Area = 7,000**	**Gross Area = 15,000**	**Gross Area = 50,000**
PHILADELPHIA, PA	Impervious = 1,000	Impervious = 3,000	Impervious =7,000	Impervious = 20,000
Gross area ($/500 sq ft * $.63/month)	$3.78	$8.82	$18.90	$63.00
Impervious area ($/500 sq ft * $4.9 month)	$9.80	$29.40	$68.60	$490.00
Billing factor	$2.89	$2.89	$2.89	$2.89
Total Monthly Bill	$16.47	$41.11	$90.39	$555.89
Annual Bill	$197.64	$493.32	$1,084.68	$6,670.68
BALTIMORE, MD	Impervious = 1,000	Impervious = 3,000	Impervious = 7,000	Impervious = 20,000
– Equiv. Residential Unit = 1050 sq ft				
– Rate = $5 per ERU per month				
Total Monthly Bill	$5.00	$15.00	$35.00	$95.00
Annual Bill	$60.00	$180.00	$420.00	$1,140.00
ROCKVILLE, MD	Impervious = 1,000	Impervious = 3,000	Impervious = 7,000	Impervious = 20,000
– Equiv. Residential Unit = 2330 sq ft				
– Rate = $11 per ERU per month				
Total Monthly Bill	$11.00	$22.00	$33.00	$88.00
Annual Bill	$132.00	$264.00	$396.00	$1,056.00

GWINNETT COUNTY, GA	Impervious = 1,000	Impervious = 3,000	Impervious = 7,000	Impervious = 20,000
– Equiv. Residential Unit = 100 sq ft				
– Rate = $2.46 per ERU per year				
Total Monthly Bill	$2.05	$6.15	$14.35	$41.00
Annual Bill	$24.60	$73.80	$172.20	$492.00

LANCASTER, PA	Impervious = 1,000	Impervious = 3,000	Impervious = 7,000	Impervious = 20,000
– Equiv. Residential Unit = 1,000 sq ft				
– Rate = $52 per ERU per yr				
Total Monthly Bill	$2.17	$10.83	$30.33	$86.67
Annual Bill	$26.00	$78.00	$364.00	$1,040.00

WILMINGTON, DE	Impervious = 1,000	Impervious = 3,000	Impervious = 7,000	Impervious = 20,000
– Equiv. Residential Unit = 800 sq ft				
– Rate = $14.85 per ERU per yr				
Total Monthly Bill	$6.19	$18.56	$43.31	$123.75
Annual Bill	$74.25	$222.75	$519.75	$1,485.00

MEADVILLE, PA	Impervious = 1,000	Impervious = 3,000	Impervious = 7,000	Impervious = 20,000
– Equiv. Residential Unit = 2,660 sq ft				
– Rate = $7.50 per ERU per month				
Total Monthly Bill	$7.50	$8.46	$19.74	$56.39
Annual Bill	$90.00	$102.00	$240.00	$672.00

WHITE TOWNSHIP, PA	Impervious = 1,000	Impervious = 3,000	Impervious = 7,000	Impervious = 20,000
– Equiv. Residential Unit = 3,700sq ft				
– Rate = $2 per ERU per month				
Total Monthly Bill	$2.00	$2.00	$3.78	$10.81
Annual Bill	$24.00	$24.00	$48.00	$132.00

According to Western Kentucky University's Stormwater Utility Survey of 2018, the average monthly single family residential stormwater fee nationwide in 2018 was $5.34 and the median fee was $4.00. Overall, the range of monthly fees stretches from zero to $69.25, but there is no clear pattern. (I.e., States that tend to have higher average fees also have utilities with much lower fees.) Stormwater needs, budgeting practices, and local politics may help explain these differences.[2]

Notes:

- *If the ERU exceeds the impervious cover in the examples above, it is assumed that the non-residential feepayer pays the base rate.*
- *Similar to some other localities, Baltimore's ERU calculation rounds up to nearest whole ERU. (I.e., 3,000 sq ft impervious/1,050 sq ft ERU = 3 ERUs.)*

MINI-CASE STUDY: Meadville and White Township, PA

Two small Pennsylvania towns, Meadville (13,600 residents) and White Township (15,800 residents) are included in the fee analysis because their population approximates that of the average municipality in New Jersey. As noted in Table 2, however, their monthly stormwater utility fees differ significantly, with Meadville charging $7.50 and White Township charging $2 for a sample property of 1,000 square feet. This comparison helps highlight the variability of stormwater utility fees, even among similarly-sized communities in the same state. In this example, some of the key explanatory factors are listed below:

	Meadville ($7.50/Mo)	**White Township** ($2/Mo)
Land Area	6 miles	43 miles
Development	Fully built out	Rural
Age of Infrastructure	80–90 years	50–60 years
Tax Exempt Properties	45% of assessed value	19.5%
Special Needs	$3m repair of high hazard dam	NA
	Two high grade trout streams	NA
Budget Practice	Fee = full stormwater cost	Fee = 50% of cost
Taxation		
Municipal Property Tax	Yes	No
Local Tax Level	At local tax limit	Not at local tax limit
MS4 Discharge Permit	Yes	No

2 Western Kentucky University, "2018 Stormwater Utility Survey", (2018)

CREDIT PROGRAMS AND OTHER PROPERTY OWNER INCENTIVES

According to a 2018 survey by Black and Veatch, more than half (53 percent) of all the stormwater utilities surveyed offer partial fee credits to property owners to encourage the implementation of stormwater mitigation measures. That figure is up from 44 percent in 2014. Also, while 54 percent of stormwater utilities offer such credits to both residential and non-residential property owners, the remaining 46 percent limit them to the non-residential side only.

Generally, credit programs are designed to encourage a greater amount of stormwater-related retrofitting of property than would have otherwise occurred (i.e., due to permit or development requirements). Wisely implemented, this strategy is entirely consistent with the program's "user fee" strategy, reducing fees while also reducing stormwater runoff.

The vast majority of stormwater utilities (82%) cap the value of the credit. The table below outlines the range of maximum stormwater fee reductions:

Maximum Fee Reduction	Participating Stormwater Utilities
Over 75%	21%
50% – 75%	34%
25% – 50%	42%
< 25%	3%

Green infrastructure projects are very popular. Over 50% of stormwater utilities offer credits to encourage the construction of "green infrastructure," essentially engineered systems that enable water to soak into the ground where it falls or to be captured for beneficial reuse. Examples include rain gardens, cisterns, green roofs and permeable pavement.

Some incentive examples are listed below:

Green Permit Program (Expedite Permit Review and/or Reduce Fees)

In Chicago, commercial permit applications that are certified within the Leadership in Energy and Environmental Design (LEED) rating system and include green infrastructure such as green roofs, rainwater harvesting, solar panels qualify for expedited processing and possible reduction of permit fees. In Philadelphia, projects with 95% or more of impervious area disconnected from the local sewer system can qualify for fast track permitting review. Such incentives can be structured to particularly encourage businesses that are on the cusp of deciding whether to invest in green infrastructure, thus efficiently applying available credits to maximize the amount of land that is retrofitted. If successful, stormwater benefits are realized without additional government expenditures.

Decreased Stormwater Plan Review Standards

Any redevelopment plan in Philadelphia that reduces stormwater by at least 20% is exempted from the City's standard channel protection and flood control requirements. Redevelopment is an ideal time to consider stormwater management, as reduced review standards could accelerate the project in exchange for stormwater management improvements that would not have been realized otherwise.

Higher Densities

In some cases, the sheer size of the annual stormwater fee does not pose a realistic incentive for construction of on-site stormwater improvements beyond the minimum required, however some cities consider allowing developers to build at higher densities. Localities receive stormwater reductions at no cost while improving the developer's profit margin.

Reduction in Mandated Parking

For retail centers, industrial facilities, and suburban office parks, scaling back the amount of parking that is mandated for a given development can increase projected profits in exchange for on-site stormwater improvements. To the extent that local zoning requires parking based on peak demand, or simply more than the market truly demands, this reduction incentive could be attractive.

Additional Credit Structures

- In several Maryland counties, landowners can cut stormwater fees by up to 50% by implementing approved best management practices at their expense. In some cases, the county maintains the infrastructure thereafter.
- In Philadelphia, businesses that install green roofs may claim a 25% credit (up to $100,000) against the Business Privilege Tax for the year in which the facility was built.
- In Anne Arundel county in Maryland, properties that have stormwater controls in place as part of their NPDES permit as well as marinas that have been determined to have no stormwater exposure may reduce stormwater fees by up to 50%. (A residual fee is necessary to account for public infrastructure, such as roads,that are used by all.)
- The City of Baltimore offers a Harbor Discharge Credit of 30% for property owners that drain to privately-owned and maintained storm drains that connect directly to Baltimore Harbor. To qualify, applicants must submit detailed drawings of the property, including manholes, roof drains, and outfalls. The credit, which is calculated by multiplying the square footage of directly-drained impervious cover by 30%, lasts for five years.

Other innovations that may be of interest to property owners:

Fee Phase-in and Increase Cap

To help soften the impact of its stormwater fee on non-residential properties, the City of Philadelphia phased in the program over four years and placed a cap on fee increases, limiting them to no more than 10% in any given year. The latter measure essentially stretched the planned increase over a ten-year period.

Advisory Committee

Normally, non-residential feepayers participate only in the original version of the Advisory Committee that develops initial plans for the new utility. Ongoing participation after enactment allows businesses to have input as the program unfolds.

Multi-Municipal Fee Systems

Towns that band together regionally under a common set of program parameters (e.g., fee structure, approved credits) can realize considerable savings by minimizing administrative costs, reducing permit fees (i.e., significantly fewer projects but on a larger, regional scale), eliminating duplicate services, (e.g., public outreach), cooperative purchasing (e.g., one contract for aerial surveillance of impervious cover), and overcoming land constraints (e.g., county use of private property to implement high-value improvements). The cooperative would submit a single, shared stormwater plan to the State for approval. County planning district commissions often serve as the common organization. In another example, the Wyoming Valley Sanitary Authority in Luzerne County, PA, agreed in 2017 to serve as the stormwater coordinating body for 35 towns within its service area. Individually, these municipalities planned to implement 455 stormwater projects at a cost of $69m. Instead, the Authority will realize the same environmental benefit through 65 larger-scale, regional projects costing $12m, a capital savings of $57m.

Tradable Credits

This alternative, which is loosely modeled on the air emissions "cap and trade" program that has been in operation for several years, has been slow to progress in states that have authorized it (MD, VA, PA). The owner of a property that is expensive to retrofit for stormwater controls would fund improvements at another, easier-to-retrofit property and receive a fee credit. If not motivated financially, the same result could be realized through a regulatory mandate when a site is being developed or redeveloped (i.e., development is blocked unless stormwater improvements are installed). As long as the cost of the improvements is less than resulting development-related profit, the owner is incentivized. If successful, this measure lowers the cost of stormwater improvements by accelerating less expensive but valuable projects that otherwise would not have advanced. (Such a program has been implemented in Washington, D.C., however additional study is required before other jurisdictions could implement this.)

Flood Defense New Jersey
flooddefensenj.org

New Jersey League of Conservation Voters Education Fund
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