Section One Outline

1. Introduction

Stormwater management at the local municipal level has changed significantly within the last twenty years. It was once primarily a peak flow and flood control practice—what was often considered as a secondary responsibility of a Public Works or Street Department, and/or the planner for FEMA floodplain management. The water quality regulatory component, through the National Pollutant Discharge Elimination System (NPDES), although important, was considered as a sideline duty of an environmental or public works staff person. There were, of course, exceptions to this description and several programs driven by significant damaging flooding, aging and visibly failing stormwater systems, or specific numeric stormwater regulatory requirements who sought stable, adequate and equitable funding sources.

In the intervening time, many factors, including: the rise of green stormwater management; the maturation of many water quality programs; the impacts of more intense rainfall, and the necessity for resilience planning and initiatives; and the realization that underground stormwater systems were reaching their functional life, requiring massive rehabilitation and replacement programs has driven the average cost of stormwater programs to increase several fold compared to what they were twenty years ago (current dollars).

1.1. Stormwater Funding – Types and Uses of Funds

In the face of increasing costs, communities have implemented a variety of approaches to provide necessary funding – however few of them have the revenue capacity or one-time influx of funds required to support anything but small projects or ancillary programs. If we look at the end result of the various types of funding they tend to fall into four categories: (1) revenue – ongoing stable and significant flow of funds including taxes of various types, franchise fees, and stormwater user fees; (2) money – one-time and often targeted funding such as grants, Federal programs, various kinds of special fees and charges often related to development services or licenses; (3) development by others – new development and redevelopment creating stormwater infrastructure or partnership approaches, or other in-kind services or volunteer programs; and (4) a variety of approaches that can increase efficiency, shift risk, or delay payment such as Public Private Partnerships, asset management efficiencies, and various types of capital financing.

1.2. Revenue: The Back Bone of Stormwater Funding

After the various non-revenue sources are taken into account, the majority of the ongoing stormwater program must be funded with revenue. Perhaps 80% of all stormwater activity (excluding capital construction) must have an ongoing, stable and dependable source of financial support so as to be able to hire key staff and provide ongoing services to plan, rehabilitate and maintain the system, conduct regulatory programs, and a accomplish a variety of ancillary responsibilities. These sources tend to fall into two broad categories: taxes and fees. Taxes can

be in the form of sales taxes, income tax, property tax, franchise fees, etc. However, stormwater management often cannot compete with other pressing demands on these sources.

The idea that stormwater management functions in a manner that resembles drinking water supply and wastewater treatment utilities far more closely than municipal responsibilities such as police, schools and roadway maintenance has led to the concept of a stormwater user fee, similar to a wastewater user fee. The first user fee systems appeared in the United States in the mid 1970's, and their apparent success in generating significant, sustainable revenue while keeping the fee paid by the typical homeowner below a critical reactionary level led to many other communities to follow suit. Today there are approximately 2,500 stormwater enterprise funds (Stormwater Utilities) employing user fees to fund their programs and to fund revenue bonds for capital construction.

This is not to say that all existing stormwater utilities charge a user fee sufficient to meet their needs. It is estimated that only about 10% of existing stormwater utilities would state that their fee covers all their needs. Raising the fee can be as difficult as establishing it in the first place and many communities still limp along with insufficient funds.

1.3. The Role of the Federal Government in Funding Stormwater Programs

The current role of the Federal government is to provide limited and regulated funding for various capital projects, often with a significant match and for targeted and limited programs and limited by annual appropriations. For example, for flood resiliency support Federal programs include Hazard Mitigation Grants, Community Development Block Grants, FEMA Pre-Disaster Mitigation Programs and Flood Mitigation Assistance, US Army Corps of Engineers flood risk studies and projects, USEPA loan programs, etc.

However, it can be imagined that the combination of local communities raising or implementing stormwater user fees to more realistic levels, in concert with the ability to repurpose the various existing Federal Programs, in exchange for local commitment to increase revenue to attain a particular desired level of stormwater performance within their communities could go a long way in solving existing problems. In most cases, local communities can typically manage and fund local stormwater collection and water quality program. The difficulty is for communities with: (1) large system flooding issues, (2) difficulty in meeting environmental standards or consent decrees, and (3) vast sections of very old and inadequate stormwater piped drainage systems. In many of these cases sources of the problem exist outside the boundaries of the community.

2. Sources and Types of Stormwater Funding

Communities across the U.S. employ a wide range of approaches to funding stormwater programs and associated capital projects. A summary of these various funding sources can be found in Table xxx: Summary of Stormwater Funding Sources. Most communities will utilize more than one source of funding. The following sections provide a brief description of each funding source, along with key advantages and limitations of each. Some descriptions are taken from various existing sources (see bibliography).

2.1. Recurring and/or Intermittent Funding Sources used to pay on-going Operation & Maintenance and Debt Service of the Stormwater System

Funding sources that are dedicated, either legally or through policy, for stormwater program.

2.1.1. Recurring, Sustainable Revenue Sources

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2.1.1.1. Taxes/General Funds

Taxes are by far the largest source of revenue for local governments, with several types of taxes that local governments use to fund operations. For local governments, such taxes, unless dedicated, are placed into the "general fund". While the types of taxes assessed, and proportion of revenue generated from each, varies from state to state, the bulk of local government revenue most commonly comes from property tax and income tax assessments.

Real property taxes, also called ad valorem taxes, are charged to property owners as a percentage of the assessed value of real estate or personal property. They are administered by local governments and require voter approval. Property taxes are an important form of revenue for local governments and they are often used as a funding mechanism for parks and open space measures.

Individual income taxes, also called personal income taxes, are assessed at the state and federal levels, but also in some locations, at the county or municipal levels, based on a percentage of income earned by individuals.

Specialized taxes can also be levied on a large number of parameters, including property transfer, occupancy, gambling, estate, motor vehicle sales and licensing, etc.

The advantage of using general fund taxes to fund stormwater programs is that general fund tax revenue provides a consistent, reliable revenue stream. In addition, these types of taxes are common and well understood. However, there is significant competition for such funds, with most communities finding it difficult to fund all general fund activities (e.g., police, fire, streets, general government, etc.) with the available level of funding. As a result, communities often find that funding available for stormwater programs may be at risk of losing funding from year to year, unless there is a dedicated source of funding restricted for the stormwater program. Another disadvantage is that the use of general fund tax revenue as a stormwater funding source raises certain equity issues, as system revenue recovery generally bears no relationship to use of, or benefit from a stormwater system, causing an inequity between the level of service provided and cost incurred by property owners. In addition, tax-exempt properties do not pay general fund taxes, causing further inequity as the revenue contributed by other properties must also recover costs incurred by tax-exempt properties.

2.1.1.2. Taxes/Dedicated

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Local sales taxes are often add-ons to state general sales and use taxes. They may also exist where there is no state sales tax. Depending on state constitutions, statutes, and home rule traditions, most local governments must seek voter approval to levy local sales taxes. State authorization processes vary. States may give approval to all counties or communities, or limit authorization to specific localities. Local taxes are usually limited to a specified time period (sunset provision), or a dollar collection total, and are dedicated to a specific use. The dedicated revenue stream may be used for operations and maintenance costs or to back local general obligation or revenue bonds or to pay for a specific stormwater program directly.

Motor fuel taxes are imposed at the state and federal levels and are levied on gasoline and other fuels. All 50 U.S. states and the District of Columbia charge gasoline taxes. State gasoline tax rates generally range from 10 cents to 33 cents per gallon. State and federal motor fuel tax revenues are typically dedicated to highway construction and maintenance. Revenues from state and federal motor fuel taxes could potentially be earmarked to fund stormwater infrastructure related to roadways, though competition for such funds is fierce with roadway resurfacing and repair normally being the top priority.

Special assessments are recurrent surcharges levied by local jurisdictions on subgroups of the population. Some localities levy special assessments in the form of taxes; others levy special assessments in the form of fees. The sub-group paying the recurrent charges receives benefits from a stormwater service or improvement not enjoyed by others in the area. For example, if a community wants to finance regional stormwater improvements, residents within the protected area, or the contributing area could be charged a special assessment. Special assessments are generally charged by local governments and authorized by local ordinance. They are often barred by constitution from use by states. Special assessments are used to fund water works systems, sanitary sewer systems, installation or repair of water and sewer service lines, flood protection projects, and other purposes.

2.1.1.3. Stormwater Utility User Fees

A stormwater utility falls under the general category of municipal revenue generation called a "service charge". Service charges are not established simply to generate revenue, but must be tied to the objectives of a specific program to which they are associated. A stormwater utility generates its revenue through user fees, and the revenues generated from the stormwater user fees is placed in a separate fund – called an enterprise fund - that can normally be used only for stormwater services. Stormwater user charges are designed in such a manner as to provide a nexus between the user fee and the service provided. As such it differs from a tax.

The amount each rate payer is charged must be related to the "use" of the system (rational nexus) which can be interpreted as either direct use through runoff, or use through upstream protection of the property by local stormwater program efforts. When a forested or grassy area is paved a greater flow of water is placed on the drainage system. This is the demand. The greater the demand (i.e., the more the parcel of land is paved or otherwise covered with an impervious surface), the greater the user fee should be.

A stormwater utility differs from drinking water and wastewater utilities in several key ways. First of all, there is no way to remove or discontinue services for non-payment. Secondly, the service is provided to all citizens without choice (though mandatory water and wastewater service makes this difference less of a distinction). Third, the demand placed on the system can only roughly be measured or approximated, as it is not possible to directly measure stormwater flow. Also, the actual service rendered to a particular property is often difficult to quantify.

Despite these drawbacks, the utility concept for stormwater financing is a viable and growing funding method with well over 2,000 in existence in the United States and Canada. The authority to implement such an approach varies from state to state, and even from municipality to municipality depending on the details of state-granted authority.

2.1.2. Intermittent Funding

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2.1.2.1. Special Fees

"State and local governments use charges and fees to help fund services." Fees tend to be focused on the provision of specific beneficial government services while charges are defined more broadly in terms of receiving special benefit or service. "When certain services provided especially benefit a particular group, then governments charge fees on the direct recipients of those that receive benefits from such services." Often the size or level of the fee is derived from the actual cost of such provision. "However, many governments provide subsidies to various users for policy reasons, including the ability of residents or businesses to pay. Well-designed charges and fees not only reduce the need for additional revenue sources, but promote service efficiency."[1]

Fees tend to fall into several categories. The first include a set of development-related services such as plans review, inspection, environmental permit fees, septic system inspections, and other similar types of services. Other fees are used to defray the cost of specific government services such as: specialized disposal (e.g., oil), recycling, tolls, certification, bond issuance, licenses, etc. A third category is related to use of government services or land, such as franchise fees, or indirect cost allocations from other enterprise funds for general governmental purposes.

The National Pollutant Discharge Elimination System (NPDES) Permit program authorizes state environmental departments to collect NPDES Permit Fees consisting of annual permit fees and permit application fees.[2] The NPDES Permit Fees are used as a means to obtain the appropriate funding to help to effectively operate the NPDES program. Franchise fees can be imposed on any private enterprise that must purchase a franchise to operate a commercial business. In order to become a franchise, a business has to pay a franchise fee. Some communities charge franchise

[1] Government Finance Officers Association. "Establishing Government Charges and Fees." https://www.gfoa.org/establishing-government-charges-and-fees.

[2] U.S. Environmental Protection Agency. "Guidebook of Financial Tools." Office of the Chief Financial Officer, 2008.

fees for the use of public right-of-way by a private entity or even a local government enterprise fund.

Advantages of such fees are that they focus costs on recipients of special services and not the general public and address potential stormwater impacts during the critical construction phase. Disadvantages are that it is often difficult to set such fees at a level that recovers the full cost of the activity necessitating the fee. In addition, revenues from such fees are intermittent and, thus, when that activity is not occurring no funds are received even though local government costs (such as personnel) may be stable and ongoing.

2.1.2.2. Special Charges

Special charges are often not distinguished from fees in that they tend to be related to specific government services or benefits. They do tend to be more complex or related to higher government functions. Examples include: impact fees, connection charges, special assessment or improvement districts, tax increment funding, developer extension fees, in-lieu fees, latecomer charges, and other exactions. Connection fees, also called hookup fees, are typically charged to property owners at the time they connect with existing municipal drinking water and wastewater treatment facilities. But they could be used for stormwater as well. Connection fees are generally levied by local governments or county governments.

Impact fees are frequently assessed on the construction of new buildings.

Local governments and county governments levy impact fees. The revenues from impact fees are used to pay for improvements to services and amenities necessary to serve the occupants of new development, including expansions of police and fire stations, wastewater and water supply systems, parks, libraries, and schools, and the building of new roads. In addition, impact fees are frequently assessed based on the projected environmental impacts of a construction project, and the revenues from the fees are used to mitigate the project's environmental impacts. The drawback of impact fees is that they can only be used to improve an adequate stormwater system in the face of increased demand. Many systems cannot be shown to be adequate and there is typically a sunset provision on the fee.

"Exactions", also called proffers, are conditions or financial obligations imposed on developers to aid local governments in providing public services needed to support new developments. They are administered by local governments. Exactions can take a number of different forms. They can include financing of existing infrastructure facilities or infrastructure improvements, donations of in-kind services, and donations of land, water and wastewater lines, and road and parking facilities. Exactions can also take the form of impact fees paid in lieu of the types of donations described above. Exactions have the benefit of allowing more flexibility than impact fees because they are not required to be financial contributions. They may be offered voluntarily by developers; and local governments often negotiate them with each developer. Most localities use exactions in some form. Some localities assign building permits competitively based on the level of exactions offered by different developers.

Special assessments are recurrent surcharges levied by local jurisdictions on subgroups of the population. Some localities levy them in the form of taxes; others levy them in the form of fees. The sub-group paying the recurrent charges receives benefits from a stormwater service or improvement not enjoyed by others in the area. For example, if a community wants to finance stormwater quality improvements that contribute to lake cleanup, residents with waterfront property could be charged a special assessment. Special assessments are generally charged by local governments and authorized by local ordinance. Special assessments are used to fund water works systems, wastewater systems, installation or repair of water and wastewater service lines, stormwater and flood protection projects, and other purposes, and are sometimes used in conjunction with a neighborhood development to fund the construction and ongoing maintenance of a stormwater detention pond or water quality feature.

Special Assessment District

Another form of local fee comes from the creation of a special assessment district. In this example, a district is designated to need stormwater management upgrades – typically green infrastructure or low impact development – as part of a broader economic development strategy. The district then creates a special tax assessment that is paid for by the property owners within the district's geographic boundary. State and local laws differ on how these districts are created and voted into existence, what funds are acceptable to be assessed, and how often assessments can be billed. These assessments may be a one-time or ongoing assessment depending on their purpose. One-time assessments tend to be raised for capital construction simultaneous to a broader economic development process. Ongoing assessments may pay for capital construction, administration of the entity in charge of governing the district, and operations and maintenance of district-owned projects. Most special assessment districts are subject to periodic renewal based on a vote by the district's members, or, depending on state laws, are mandated to have a sunset clause (e.g. 5, 10, 20 years).

Pros:

- Improves cost causation equity match
- Allows special services to be paid for by recipients
- Provides additional funding in a manner acceptable to the general public
- Recovers the cost of negative impacts of other activities on the stormwater system

Cons:

- Funds flow is not generally predictable and steady
- Can be hard to administer
- May be seen as discouraging development or other desirable activities
- May be difficult to price accurately
- Typically, covers staff time only – not funding for O&M or capital improvements
- Typically, cannot be used as leverage for raising debt capital

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2.2. One-time Funding Sources for Funding of Capital Projects and/or Other One-Time Initiatives

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2.2.1. Grants

There are a wide variety of grants available for supporting specific initiatives of capital projects from government and private foundation sources. The advantage of such grants is that there is no repayment requirement and the amounts can be substantial. The disadvantages include the competitive nature of the grants, the requirement for pre-positioned matching in-kind or funds for some grants, the limitations on the use of some grant funds, the effort required to file the applications, and the need to harmonize the grant requirements with the needs of the local government.

There are several federal and state grant programs, including both ongoing programs and one-time opportunities. A number of websites provide a good source for learning about such grants at the Federal level. Normally a focus on the various agencies that participate in the water world will yield many opportunities with a newer consolidation location being http://grants.gov. For example, the 1987 amendments to the Clean Water Act (CWA) established the Section 319 Nonpoint Source Management Program. Under Section 319, states, territories and tribes receive grant money that supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects and monitoring to assess the success of specific nonpoint source implementation projects. Grantees must utilize these funds to implement U.S. Environmental Protection Agency approved nonpoint source pollution management programs. A 40 percent nonfederal match, in the form of supplies, equipment, and/or funding, must be provided by grantees. Regulatory and nonregulatory programs assessing the success of specific nonpoint source pollution control projects may be eligible for these grants. Grant totals for the last few years were in the $170MM range.[3]

Many types of foundations and charitable organizations have begun supporting various aspects of stormwater related needs through grant making. Foundation and corporate grants are a significant and growing source of funding for environmental protection projects. Most grants of this type fund well defined projects, with specified time frames, costs, and deliverables that meet the immediate priorities of the funding source, and are not funded by governments. Foundation and corporate grant programs tend to favor the most innovative environmental projects. Funding such things as green infrastructure strictly through grants generally is not a sustainable financing strategy, but it may be a way to fund some high profile demonstration projects that will attract subsequent sustainable government or property-owner financial support.

2.3. Capital Funding Sources (Financing Vehicles, Require Repayment)

[3] U.S. Environmental Protection Agency. "319 Grant Program for States and Territories." https://www.epa.gov/nps/319-grant-program-states-and-territories.

Requires for dedicated, recurring, sustainable funding source for the repayment of principal and interest.

Leverage available funds to achieve greater capital program – spreads costs of projects over life of asset, paid by those who benefit from the project.

Source to reference for % of communities that leverage bonds/loans for financing stormwater capital projects versus paygo funding?

Types of projects that lend themselves well to capital financing (large projects, regional projects, etc.)

Types of projects that may be more appropriately funded annually from revenues (programmatic CIP, such as pipe replacement that occurs each year in a somewhat consistent manner, routine capital)

2.3.1. Bonds

"Municipal bonds are debt securities issued by states, cities, counties and other governmental entities to fund day-to-day obligations and to finance capital projects" including stormwater projects. "Generally, the interest on municipal bonds is exempt from federal income tax. The interest may also be exempt from state and local taxes" in some states. "The two most common types of municipal bonds are" general obligation bonds and revenue bonds. "General obligation bonds are issued by states, cities or counties and not secured by any assets. Instead, general obligation are backed by the "full faith and credit" of the issuer, which has the power to tax residents to pay bondholders. Revenue bonds are not backed by government's taxing power but by revenues from a specific project or source," which could include a stormwater enterprise fee. "Some revenue bonds are "non-recourse", meaning that if the revenue stream dries up, the bondholders do not have a claim on the underlying revenue source."[4] "A "double barreled" bond is a municipal bond in which the interest and principal payments are pledged by two distinct entities - revenue from a defined project and the issuer and its taxing power."[5]

An advantage of bonding is that projects can be constructed at an earlier date and more rapidly, and that the payment for the capital project better matches the life of that project with newer residents participating in the payment according to their longevity within the municipality. Disadvantages include the potential to build up a large debt balance limiting investment in other stormwater needs, the technical and legal requirements to obtain bonds, the limitations on bond capacity within a local government, the potential need for voter approval, and often the limitations on the use of the funds to capital construction but not the full suite of life-cycle costs.

[4] U.S. Securities and Exchange Commission. "Municipal Bond." https://www.investor.gov/introduction-investing/basics/investment-products/municipal-bonds.
[5] Investopedia. "Municipal Bond." 2008. https://www.investopedia.com/terms/m/municipalbond.asp.

There are many variations on the two general types of bonding including: anticipation notes, asset-backed securities, moral obligation bonds, special assessment bonds, and tax increment bonds.

Green bonds are now becoming increasingly popular. "A green bond is a bond whose proceeds are used to fund environment-friendly projects…Green bonds provide investors with a way to earn tax-exempt income with the benefit of personal satisfaction, knowing that the proceeds of their investment are being used in a responsible, positive manner. The issuers of green bonds also benefit, since the green angle can help attract a new subset of investors, namely younger investors, whom the issuers can profit from over an extended period vs. a base of older investors…The first entity to issue green bonds was the World Bank, which began the practice in 2008 and has since issued over $3.5 billion in debt designated for issues related to climate change. Ginnie Mae and Fannie Mae have also issued mortgage-backed securities with the "green" label, as has the European Investment Bank."[6]

2.3.2. Loans

There are a variety of loan types, both public and private, that can benefit local stormwater programs, though many have been targeted toward water and wastewater programs. Loans can be much less complex than bonds in that a single source provides the funds with a set of conditions and low or even zero interest. Some of the loan programs are targeted at "green" objectives and programs.

The most common of the loan programs is the Clean Water State Revolving Fund (CWSRF). Under Title VI of the 1987 Clean Water Act, states receive federal monies to capitalize CWSRF loan programs. Through CWSRF programs, loans are made to communities to provide low cost financing for a wide range of different projects for the protection of water quality. Examples of activities funded with these loans include nonpoint source pollution control, watershed protection and restoration, estuary management, wetlands restoration, brownfields remediation, and improvements to municipal wastewater treatment infrastructure. Loans are made at low interest rates (0 percent to market rate) for terms of up to 20 years. In addition, states use CWSRF money to repurchase debt to get these loans to 30 years. States may set the criteria for determining which municipalities can access the loans each year. All 50 U.S. states and Puerto Rico operate CWSRFs.

Some CWSRF and Drinking Water State Revolving Fund (DWSRF) loan programs make short-term loans for planning, design and initial construction in localities which may later receive long-term CWSRF and DWSRF loans. In addition, State Revolving Fund loans may be used to pre-finance other federal or state drinking water loans or grants.[7]

[6] The Balance. "How Green Bonds Are a Cornerstone of Responsible Investing." 2019. https://www.thebalance.com/what-are-green-bonds-417154.

[7] U.S. Environmental Protection Agency. "Learn about the Clean Water State Revolving Fund (CWSRF)." https://www.epa.gov/cwsrf/learn-about-clean-water-state-revolving-fund-cwsrf.

Another program is the USDA Water & Waste disposal Loan and Grant Program which "provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas…Funds may be used to finance the acquisition, construction or improvement of: drinking water sourcing, treatment, storage and distribution; sewer collection, transmission, treatment and disposal; solid waste collection, disposal and closure; and stormwater collection, transmission and disposal."[8]

There are also a large number of state-based loan programs with a variety of objectives and requirements. For example, Georgia has the Georgia Fund Loan Program which currently "supports water, wastewater, and solid waste infrastructure improvements…[with] loans available at a low-interest rate for a maximum of 20 years.[9]

Private investment can be in the form of loans and/or other financial assistance originating from sources other than commercial banks and/or finance companies. Sources of private investment can include, but are not limited to, insurance companies, pension funds, venture capital funds, individual venture capitalists, corporation partners, and general capital investors. Private investment funds billions of dollars' worth of new business start-ups in the United States each year. The potential uses of private investment for supporting environmentally related businesses and/or activities are only limited by the degree of profit associated with them. If it can be demonstrated that an idea or activity will make money, then private investment can be found to support it. The application process for private investment is typically much faster than for government loan programs. Private investors usually have no set eligibility criteria and may have no predetermined limits on the total amount of loan capital available. Private investors tend to demand a significantly higher rate of return on their money than other sources of capital. This approach can morph into a Public-Private Partnership should an operational component be added to the mix.

2.4. Other Resources/Approaches for Funding Stormwater Management

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2.4.1. Public-Private Partnerships

Public-private partnerships (P3) are receiving increasing attention in the United States and internationally as an innovative way of financing a wide range of different environmental protection initiatives. The point of P3's is that partnering with private enterprise can expand access to resources and capital and offer better economies of scale. There are many types of P3's including: Design/Build, Design/Build/Operate/Maintain, Pay-for-Performance (interchangeable with Pay-for-Success), Community-Based P3's, etc. They may include private financing, or a combination of public and private financing. Community-Based P3's (CBAP3) have a unique

[8] U.S. Department of Agriculture. "Water & Waste Disposal Loan & Grant Program." https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program.
[9] Georgia.gov. "Environmental Loans & Tax Credits." https://georgia.gov/popular-topic/environmental-loans-tax-credits.

feature in that they have a "commitment to social goals through setting robust requirements for local jobs, and providing a platform for economic growth and revitalization associated with large-scale GI investments. Additionally, in this framework (based upon the military housing private investment model), the community benefits through the structure of the CBP3 to reinvest savings through efficiencies in implementation back into more "greened" acres rather than simply taking the savings as profits realized. Interest in CBP3s has been growing across the country, as there is recognition of the universal applicability of this approach."[10]

In some cases, it is possible to capitalize on specific private sector resources through the use of public-private partnerships. The availability of those resources depends upon the nature of the partnership arrangements, the resources available to the private partners, the circumstances in the locations where they are set up, and other factors. Access to sophisticated technologies and specialized expertise often allows the private sector to provide specific types of services that the public sector may be unable to provide. In addition, private financing can reduce the burden on public debt capacity. Private sector procurement and construction methods sometimes save time and provide significant cost savings. Through public-private partnerships involving ownership transfers from government entities to private companies, responsibilities for financial risk can be transferred from the government entity to the private company.

There are some limitations involved with the use of public-private partnerships that must be considered. Local governments may not always have the legal authority to enter into contracts with private parties. A major concern of governments considering becoming part of public-private partnerships is the potential loss of oversight opportunities. When government officials cease to be involved with the day-to-day operations of a facility, they may have to give up opportunities to monitor things such as compliance with environmental standards and permits. In addition, public employees and unions may oppose the use of public-private partnerships due to concerns about the loss of jobs. Finally, tax-exempt and/or other low-cost financing that is available for federal and state government run projects may not be available for public-private partnerships.

Thus, the appropriateness of a particular type of public-private partnership for a given environmental protection initiative and location depends upon many factors such as the type of environmental media being protected, availability of public funding for the partnership, demographics, and the tax code.

2.4.2. Private Site Stormwater Development

[10] California Stormwater Quality Association. "The Community-Based Public-Private Partnership Approach: A Revolution In Funding And Financing Green Infrastructure." https://www.casqa.org/asca/community-based-public-private-partnership-approach-revolution-funding-and-financing-green.

On average about one million acres of land is developed per year. [11] In addition to new development there is an increasing rate of urban infill and redevelopment.[12] Private land and the drainage systems it contains provide the first line of defense against runoff pollution and flooding; and thus properly managing this development through a variety of mechanisms is important. The cost for the vast majority of these structures is borne by private developers.

Local governments primarily regulate stormwater on such developments through an array of zoning and design standards, planned developments, changing zoning approaches (e.g. transect and new urbanism), financial and physical alternatives to on-site development (such as in lieu, trading, off-site aggregation, and banking programs), and coordinated infrastructure master plans.

Some of these approaches benefit from direct local support such as cost, technology and/or labor share programs for voluntary redevelopment or retrofitting of more environmentally conscious designs. Financial support for such programs tends to come from existing financial resources such as grants, or budgetary recognition. Also, financial crediting programs through a stormwater user fee program can incentivize construction and ongoing maintenance of such systems.

Failures within such programs are often the result of incorrect designs or faulty construction not caught in the review or inspection process; failure to both educate and enforce long-term maintenance; and lack of education of the citizenry. Additionally, there is some question about the ability of the use of only distributed stormwater systems to appreciably impact the negative consequences of urban runoff. This is especially true when less than 2-5% of the currently constructed urban area is renewed each year.

2.4.3. Volunteer Programs

Volunteers can provide free labor for a variety of local stormwater program efforts. Examples include: education, technical assistance to homeowners, inspections, clean ups, adoptions of various stormwater systems and rivers, grant writing, watch dogs, and more. Some such organizations and individuals can bolster support for various stormwater programs or funding approaches. Citizen groups can assist in decision making and in selling such decisions to the general public. River Keeper type groups can provide a sense of stewardship of precious water resources and can serve as great allies with local governments. Some can help run and manage programs such as rain gardens, citizen monitoring, stream cleanups, etc.

Some volunteer groups require a significant amount of supervision and training for the perceived return on investment, and there can be safety and liability concerns when volunteers partner with local governments for activities.

[11] Bloomberg. "Here's How America Uses Its Land." 2018. https://www.bloomberg.com/graphics/2018-us-land-use/.
[12] New Geography. "Special Report: Infill in US Urban Areas. 2009. https://www.newgeography.com/content/00852-special-report-infill-us-urban-areas.

Another approach that can reduce or eliminate these negative aspects that can be contained within this category is the idea of adoption of stormwater management features. There are locations where individual groups or companies adopt a street, detention facility, pond, greenway, or other feature in the same way a company may adopt a stadium in return for naming rights. Signage can be placed along a road or near another feature with the corporate name and/or logo. Such has been done by Boeing and Starbucks.

2.4.4. Coordination with other Community Departments

Synergies can be gained among agencies that influence some aspect of stormwater management when they cooperate, or those, often better funded departments or agencies, provide funding or services to the stormwater program. The idea is that the harmonizing of various departments can provide a "whole that is greater than the sum of the parts".

Examples include: a solid waste agency providing household hazardous waste assistance; a wastewater agency working to eliminate seepage of wastewater into the stormwater system as part of an I&I program; a public affairs office providing assistance to the stormwater program in implementing certain activities; an agency that bills for service providing inserts explaining some aspect of the stormwater program; a public works or transportation department can add stormwater components or green infrastructure features as a small part of a construction project. This can even work with agencies from different entities or at different levels of government.

Outside programs or organizations can incentivize such partnerships (e.g. watershed groups spanning several local governments or DOTs) through coordination and funding efforts.

2.4.5. Market-Based Solutions

Local and state agencies, oftentimes in collaboration with EPA, have created market-based solutions to tackle various water quality challenges – inclusive of nutrient reduction, volume control, and wetland mitigation, among others. These markets are designed to attract private capital, take advantage of efficiencies gained from private delivery of projects, and/or direct solutions geographically to where they are needed most. An internal memo issued by EPA on February 6, 2019, reiterated its support for market-based solutions, particularly for non-point source pollution (i.e. stormwater), and provided clarity to state and local regulators and policymakers on best practices to implement locally-appropriate solutions.[13] The most common form of market-based solution is through the creation of a credit or unit of measure that denominates and quantifies an environmental outcome against a specific regulatory mandate (e.g. Total Maximum Daily Load). The supplier of a credit is typically a non-regulated private or public entity that has the financial wherewithal to build a project or a regulated entity that can go above and beyond what is currently required of them. In both cases, this supplier generates additional environmental capacity that can be sold to offset a regulated private or public entity's

[13] https://www.epa.gov/sites/production/files/2019-02/documents/trading-policy-memo-2019.pdf

regulatory requirements. A functioning market will have many buyers and sellers and a dynamic price based on what the market will bear.

Examples include wetland mitigation banking, nutrient trading, and stormwater volume trading. Stormwater trading is an emerging local solution pioneered by the District of Columbia's Department of Energy and the Environment, via the creation of a Stormwater Retention Credit (SRC) and is profiled in a case study in Section 3.4.7. The purchase of SRCs is seen as more cost effective to a regulated property owner or developer, but equally effective in attainment of the District's regulatory standard.

Pros:

- Creates cost efficiencies in placement of stormwater controls
- Can allow for aggregation for better overall control and treatment
- Can shift and target controls to more critical locations and be combined with other public incentives (e.g. grant programs) to further incentivize credit suppliers to develop projects in specific geographic locations.

Cons:

- Can be complex to administer
- Requires clear and enforceable policies on ownership and maintenance
- Markets may be not be initially viable and may need to be jumpstarted with local funding

2.4.6. Newer Innovative Approaches

Market-based solutions are just one of many new approaches that can attract new forms of funding and financing. A wide variety of approaches that seek to exploit unique or unusual funding sources are being explored in the stormwater space. Some examples include: sponsorship of stormwater or green infrastructure sites by private and/or public organizations, similar to adopt-a-road advertising; tax increment financing that can be leveraged in the event a new green infrastructure facility is designed to increase surrounding property values, property owners of those properties agree to a new tax levy, and an agency is designated legally to issue tax increment bonds; use of private land for public infrastructure through various partnership and payment mechanisms between public agencies and private landowners; 'complete' or 'green' street policies that mandate road repairs include stormwater management, often combined with vegetative practices or other aesthetic improvements; user fee credits that incentivize reduction in impervious area; green ratio ordinances that require developers within in certain zoning districts to dedicate a percentage of their property to natural area, which can manage stormwater runoff; various development incentives, including floor-area-ratio bonuses, expedited permitting, and others in exchange for voluntary construction of stormwater management practices; strategic partnerships between communities and philanthropic sources to enhance public spending; among others.

Pros:

- Can provide funds at little cost
- Can motivate the private sector through name recognition
- Can provide good return on seed money investment when paired with private actions

Cons:

- Can be hard to administer and explain
- May require opinions and analysis on legality

3. Available Funding

xxx

3.1. Distribution of funds in each region

xxx

3.1.1. Federal

What federal agencies are funding stormwater activities? How? Qualifications for funding? Extent of coordination between agencies? Funding partnerships between federal and non-federal organizations? For SRF loans, how distributed to states. How funds are used.

3.1.2. State

General discussion of type and range of funding sources?

For SRF, how state programs differ. Rather than state by state summary of how SRF loans are administered, keep higher level but quantify state match %/$?

Reference Matrix in Appendix – pull in examples

3.1.3. Local

xxx

Stormwater Utilities

Local water quality and flood control agencies/districts or utilities are typically responsible for designing, assessing, and collecting new taxes or user fees based on a property's contribution to the stormwater management system. As indicated in Section 2, the most common form of local funding into stormwater utilities is a user fee or stormwater tax that is dedicated solely for stormwater services. Additional revenue into these administrative bodies can come from permit fees, local taxes with a carve-out for stormwater services, special assessment districts, and other sources. These fees/taxes are typically used to manage a stormwater compliance program, inclusive of administrative fees, capital expenditures; operations and maintenance of the

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stormwater system owned/controlled by the entity assessing the fee or tax, and cash financing of capital projects associated with the stormwater system. These funds may also be used to run local grant programs that encourage private property owners to build or retrofit stormwater management facilities.

According to the 2019 version of an annual survey conducted Western Kentucky University (WKU), at least 1,716 stormwater utilities currently exist across forty states and the District of Columbia, serving a total population of nearly 115 million people (35% of the U.S. Population). Of the 10 states that do not have utilities, three are in the midst of either feasibility studies or exploring changes in state law to allow implementation of stormwater utilities.[14]

While there are many forms of revenue funding stormwater utilities, according to Black and Veatch Management consultants (B&V) 2018 biennial survey the majority of stormwater utilities (87%) responding to the survey use cash financing for stormwater services delivery.[15] This indicates that stormwater utilities do not frequently use the capital markets to augment their financial capacity, which can delay needed upgrades and/or impact the pace of compliance programs. Further, only 15% of survey respondents to B&V's indicated that utility revenue is adequate to meet all needs.

The median annual revenue per capita reported in B&V's survey was $54. If this sample is representative of all people served by utilities in the WKU study (115 million), it represents roughly $6.2 billion in annual revenue generated by stormwater utilities. WKU does not provide annual revenue details for all utilities surveyed, but found roughly $2.2 billion in utility fees, with 20% of that figure coming from one utility: Chattanooga, TN. The authors of this report do not have quantitative details that would account for this discrepancy. Though, recommend that more research is needed to provide a full accounting of all public revenue that is raised towards stormwater management and compliance.

State statutes may prevent the creation of a stormwater user fee without a ballot measure or enabling state legislation. See the legal section (3.2.2) for a discussion on user fee creation and legal challenges.

3.1.4. Private

Private sources of funding and financing for stormwater management have grown in size and sophistication as compliance programs have become more stringent, infrastructure has reached the end of its useful life, public budgets and bond capacity have become strained or limited, and more attention and resources have been allocated at the state and local levels to stormwater management. Examples of private sources may include traditional debt and equity financing, program-related investments, impact investing and other non-traditional market-based investments, and private philanthropy. See below for an illustration of the spectrum of private

[14] Campbell, C. Warren, "Western Kentucky University Stormwater Utility Survey 2019" (2019). *SEAS Faculty Publications.* Paper 1. https://digitalcommons.wku.edu/seas_faculty_pubs/1

[15] https://www.bv.com/sites/default/files/18%20Stormwater%20Utility%20Survey%20Report%20WEB.pdf

investments.

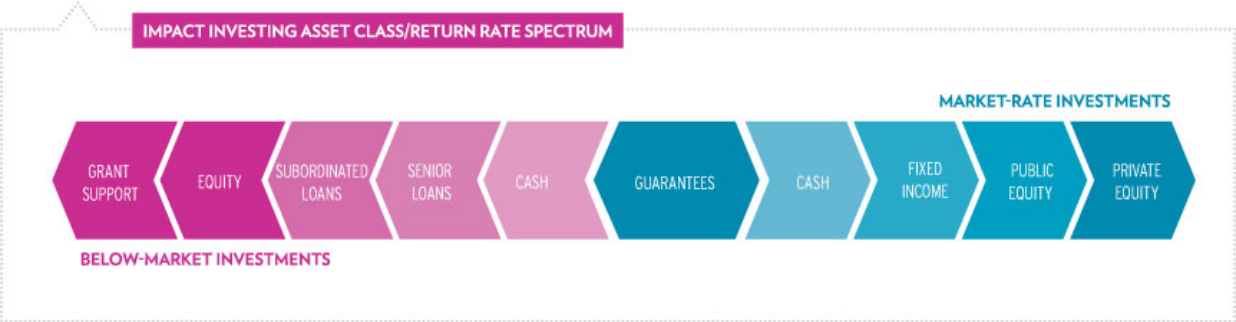

Image Source: Global Impact Investment Network

For traditional debt and equity providers, stormwater projects represent another avenue for traditional construction debt or project equity financing. Similar to public private partnerships for toll roads, bridges, or private water provisioning, debt and equity providers can leverage stormwater fees and other tax revenue to provide financing for the construction of stormwater management practices that are either operated privately or turned over to a public utility for long-term operations. Utilities and communities without bonding capacity, or a desire to shift risk of construction and/or operations to the private sector may take advantage of these types of structures and financing. Some specific examples are included below and in Section 3.4 (Case Studies). The total amount available for this pool of capital is not easily quantified but generally speaking, financial institutions invest trillions in municipal bonds that are backed by that municipality's balance sheet. If project financing is secured by tax revenue from a credit-worthy municipality, some portion of funds designated to municipal infrastructure bonds could be invested in project vehicles. And in fact this is already happening: according to McKinsey, institutional investors finance $300-400 billion of infrastructure per year across all asset classes (including water) worldwide.[16]

"Impact investments are investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return."[17] Investors in this space may invest alongside traditional debt and equity providers, or may be traditional debt equity providers themselves. The distinction is that these investors may in certain circumstances take a lower-than-market-rate return in exchange for quantifiable social and environmental impact; or invest in projects with the expectation of a market-rate return that traditional firms might not otherwise invest into because of higher perceived risk, administrative cost, or a smaller investment than a large financial institution is willing provide capital into. In all cases, however, impact investors expect quantifiable impact. Impact investors in the stormwater space tend to be interested in

[16] https://www.mckinsey.com/~/media/mckinsey/industries/capital%20projects%20and%20infrastructure/our%20insights/the%20next%20generation%20of%20infrastructure/financing_change_how_to_mobilize_private-sector_financing_for_sustainable-_infrastructure.ashx

[17] Global Impact Investors Network: https://thegiin.org/impact-investing/need-to-know/

green infrastructure or low impact development projects that help bolster communities that have been traditionally underinvested. Like traditional investors, quantifying the total impact capital dedicated to water infrastructure is challenging. The Global Impact Investment Network estimates the total size impact investment assets under management at $508 billion worldwide. However, there no breakdown in their analysis that shows the proportion of those dollars that have been invested in the U.S., and specifically in U.S.-based water quality projects.[18]

Investing alongside impact investors and sometimes traditional debt and equity investors may be foundations providing program-related investment (PRI). A PRI is a "type of mission or social investment that foundations make to achieve their philanthropic goals. PRIs are typically utilized to make below market rate capital available to organizations that are furthering the foundation's priorities. A key attribute of the PRI is its flexibility, which means it can be structured to effectively address different types of financing gaps."[19] PRI programs in the stormwater space are somewhat nascent but there are groups of funders that are increasingly seeing the need to provide PRI capital to augment public incentive programs for delivering stormwater capacity to private properties. In this example, a municipality or stormwater utility may want to administer a private property grant program as part of its overall stormwater management and compliance program. The most famous example of this in the U.S. in Philadelphia's, Green City Clean Water program, for which the Philadelphia Water Department (PWD) is attempting to manage 10,000 acres of impervious cover, 1/3 of which will likely need to come from private property. To incentivize private property owners to enter the program, PWD makes public dollars available to pay property owners and stormwater project developers to construct projects. PRI investors are looking at the program to see if there is a way to incentivize a variety of additional benefits within those projects, including providing bonuses for project development in under invested communities, increasing the proportion of vegetated practices, and/or creating a pool of predevelopment funding/financing, among other areas of need.

Philanthropic grants also provide a resource for stormwater project development. "In 2010, U.S.-based foundations gave over $1.2 billion to environmental causes in particular, including land and water conservation, sustainable agriculture, clean energy, and environmental education."[20] Grants are increasingly a resource for aspects of a stormwater program that are not compliance-related, including but not limited to public health improvements, community aesthetic benefit, using low impact development to drive economic development in underinvested communities, among others. An informal poll of the Urban Water Funders Network – a consortium of leading national and local philanthropic funders focused on urban water issues – found the following:

Urban Water Funders Grant Data[21]

- 27 Funders

[18] https://thegiin.org/assets/Sizing%20the%20Impact%20Investing%20Market_webfile.pdf
[19] https://kresge.org/sites/default/files/library/env1018-capital-scan-final.pdf
[20] http://www.conservationfinancenetwork.org/sites/default/files/FinalReport_Yale_WaterPhilanthropy_070816.pdf
[21] From email exchange with Nathan Boon of William Penn Foundation, and Steering Committee Member of Urban Funders Network (https://www.fundersnetwork.org/participate/urban-water-funders/)

- $125,738,270 in active grants (grant years 2017-2019)
- 576 grants
- $63.7M coded for "Green Stormwater Infrastructure of other Stormwater Issues"

While private sources of funding and financing are growing, each requires a commitment to and the existence of public funding of a stormwater management plan and vision. Private sources are there to augment and provide some efficiency to those programs/funding streams, whether in terms of filling funding gaps through philanthropic grants, providing financing to accelerate programs that do not have the financing capacity to do so, or utilizing private financing to shift risk onto the private sector. So, while private sources increase the near-term availability of funds dedicated to stormwater management, they are cannot solve for a public funding gap to meet a community's clean water goals.

3.1.4.1. Public/Private Partnerships (P3)

xxx

3.1.4.2. Private Development Sites

xxx

3.1.4.3. Volunteer Programs

xxx

3.1.4.4. Market-based Solutions

xxx

3.1.4.5. Newer Innovative Approaches

xxx

3.2. Barriers to Obtaining Funding

Previous sections summarize the plethora of funding opportunities for stormwater programs. However, this discussion would not be complete without mention of the many barriers to funding stormwater programs in any meaningful way. As with most public funding schemes, there is a tension between the need for funding and the access to funding – as well there should be in a public arena. Blank checks do not exist, nor should they. But in many instances, the barriers are substantial, and are the reason why stormwater programs across the country are experiencing such a huge gap between need and funding.

This section focuses on recurring, sustainable sources (such as taxes and user fees, Section 2.1.1) because they form the backbone of any funding portfolio and can be the most difficult to secure at required levels.

3.2.1. Political Barriers

An underlying principle of our way of governance is that it is done with the permission of the governed. Financial support for governmental programs and services cannot be effectively established without substantial buy-in from the members of the community. This sets the stage for political tension, and managing the relationship between community members and elected officials is essential for stormwater program managers in the overall running of programs as well as establishing funding structures. There are many drivers for political barriers including public perception, historical context of stormwater management and funding, competition from other public programs, and a general cynicism for any new proposal for taxes or fees.

3.2.1.1. Public Perception

There is general fatigue from taxes and fees, particularly for utility bills when water and sewer bills seem to increase much faster than other things. This translates to cynicism, which is amplified for stormwater funding as the last ones to the table.

Stormwater is not always seen as an essential service. Like many other underground utilities, the average citizen may not even know it exists or how it enhances their quality of life and, potentially, property values. In many communities, chronic system failures may only be evident as a minor nuisance such as intersection flooding. In addition, other common property services such as water, sewer, and garbage collection have been historically seen as essential public health services. Where the average citizen is actively involved by turning on the kitchen sink faucet, flushing a toilet, or putting the garbage out at the curb once a week, stormwater services are much more passive in nature. So, it is not surprising to find a general ignorance about stormwater systems.

This is the setting in which a municipality may ask for a new stormwater user fee. Common questions or concerns are voiced such as:

- Why, all of a sudden, do you need a new fee? How did you pay for stormwater management before this?
- Why did you wait until it's an emergency to ask?
- Don't my taxes pay for this?
- A rain tax; what's next?

These and other questions can be difficult to explain to the public at large. This is particularly difficult when the municipality has not done an effective job of showcasing the stormwater systems previously.

3.2.1.2. Elected Officials

The most common political barrier stems from electoral politics itself. Members of local governing bodies are hesitant to increase taxes and fees for many reasons, not the least of which is the desire to get reelected. This is how our representative form of government is designed to work to ensure that elected officials shape policy that benefits the community in general. When a local agency finds a large backlog of stormwater needs requiring a new set of fees, the elected official is put in a difficult situation and may be reluctant to lend support.

3.2.1.3. Competing Needs

Municipalities are one of our most potent forms of government providing the widest array of public services to its citizenry. These typically include police, fire, parks and recreation, roads, utilities, libraries and other facilities, and other general social services. It becomes apparent that stormwater programs and facilities compete for public funds in a crowded field. Whether through strategic planning, annual budget requests, or electoral politics, stormwater service is often low on the list of municipal priorities.

3.2.2. Legal Barriers

Funding for public programs must comply with a variety of legal requirements, many of which are noted in previous sections of this report. In some cases, these legal requirements can be barriers to developing funding for stormwater programs.

3.2.2.1. Legal Requirements

Many states have legal restrictions that supersede a local governing body's authority for imposing a stormwater fee. For instance, until a few months ago the State of New Jersey prohibited the formation of a stormwater utility or imposing fees. However, their Governor has now signed legislation giving that authority to municipalities. The State of California voters approved Proposition 218 in 1996, a constitutional amendment making it more difficult for local government to impose taxes, fees and assessments. One provision (clarified in a 2002 court ruling[22]) requires stormwater fees to be submitted to a ballot measure requiring either a 50% majority of affected property owners or two-thirds majority of registered voters to impose (or increase) a stormwater fee. Since 2002 only 31 stormwater ballot measures have been pursued statewide (among more than 500 municipalities); approximately two-thirds have been approved by voters.

Overall, 41 states and the District of Columbia have at least one stormwater utility. The other nine states have none, and legal barriers may play a part in that.

3.2.2.2. Legal Challenges

Legal challenges of new stormwater fees are a concern to many municipalities, particularly small ones who are limited in the resources needed to sort through complex and sometimes ambiguous enabling legislation. "Such is the case in Pennsylvania where regional approaches are being pursued in the counties of Blair, York, Lancaster and Montgomery, but, even there, one of the

[22] California Sixth Appellate District, Howard Jarvis Taxpayers Association versus the City of Salinas, 2002. That decision acknowledged the ambiguity in Proposition 218 text as to whether stormwater fell under the definition of sewer, which did not have the ballot requirement. In 2017, the California Governor signed Senate Bill 231 clarifying that definition to also exempt stormwater fees from the ballot requirement. The Salinas plaintiff has vowed to sue any municipality that sets fees accordingly. However, the threat of litigation alone has caused most cities to continue to take fees to the ballot.

major barriers to implementation is concern about the confusing details of the enabling legislation and fear that implementation won't confirm and will be mired in legal challenges."[23]

Legal challenges do occur. Previously mentioned was the *Salinas* case in California, which significantly changed the stormwater funding landscape in that state. The Western Kentucky University *Stormwater Utility Survey* from 2013 contained a summary of legal challenges. "We have now identified 76 legal or political challenges to stormwater utilities in the U.S. Figure 7 shows the map of utilities challenged and the outcomes to date. Of the 76 challenges, 44 were decided in favor of the utility, while in 16 cases the utilities received unfavorable decisions or were struck down. Twelve of the cases are still pending or we were unable to find whether or not a court decision had been reached. Five challenges were successful political challenges. Stormwater utilities in Birmingham, Alabama, Colorado Springs, Nampa, Idaho, Manitowoc, Wisconsin, and in Cumberland County, North Carolina were repealed."[24]

The 2018 edition of the Black & Veatch Stormwater Utility Survey[25] asked the 75 participating agencies whether their stormwater user fees ever faced a legal challenge. They found that 27% of the respondents said "yes." The basis of challenge varied as follows:

- Tax and not a user fee (38%)
- Lack of authority to assess SW fees (24%)
- Equity and fairness (17%)
- Rate methodology (14%)
- Rational nexus between costs and user fees (3%)
- Constitutionality (3%)

3.2.3. Equity Issues

As many as 92% of stormwater utilities base their fees on relative impervious surface area.[26] This is a well-accepted method to ensure fair distribution of costs to customers, one of the distinguishing features of a user fee (as opposed to a tax). An unintended consequence of that fee basis is the potential of a disproportionate financial burden placed on properties in disadvantaged areas. Residential densities tend to be higher, which is often accompanied by a much higher percentage of impervious surfaces (and thus a higher proportion of the fee base).

[23] EFAB Report: *Developing Dedicated Stormwater Revenues*, February 26, 2016.
[24] Western Kentucky University, *Stormwater Utility Survey*, 2013

[25] Black & Veatch Management Consultants, LLC, *2018 Stormwater Utility Survey*, Stormwater Rate Structure and Billing.

[26] Black & Veatch Management Consultants, LLC, *2018 Stormwater Utility Survey*, Stormwater Rate Structure and Billing.

Low-income areas also tend to be in low-lying, flood-prone areas where insufficient stormwater capacity is first felt. These neighborhoods also tend to be rental properties where landlords have little incentive to invest in green spaces or low impact development.

Rate discounts or exemptions for low-income or seniors are sometimes difficult to provide. With no rational basis for reducing rates based on impervious surface, some states do not permit such discounts unless subsidized by non-stormwater funds (such as a city's general fund).

3.2.4. Administrative

Sometimes the greatest barrier to forming a stormwater utility is the agency's internal administrative structure. This is particularly true for local municipalities where various stormwater functions have evolved within different departments or divisions. For example, infrastructure maintenance may reside in the streets or sewer departments, NPDES compliance in the environmental group, capital planning in the engineering division, and financial services in the finance department. In other words, it is all too common to find these functional units distributed throughout a municipal organization without unified leadership or cohesive functionality.

Without such leadership, it can be very difficult to champion a cause such as initiating a stormwater user fee. Support for change must often come from senior management in order to be implemented.

3.2.5. Limited Resources

Managing a complex municipal utility requires significant resources that are often lacking - particularly in small/midsize municipalities or ones that are attempting to launch a stormwater utility structure for the first time. These resources may include:

- Strategic & financial planning
- Asset management
- Technology (GIS, data)
- Public engagement (branding, outreach)

The path to a dedicated and sustainable revenue stream includes all of the above (needs analyses, financial planning, fee study, community engagement). This can cost $300,000 to $1 million or more and take two or more years. In addition, competing in the grant funding arena demands that a stormwater agency possess expertise in grant writing and grant administration.

Finally, basic NPDES permit compliance is a complex and time-consuming endeavor to which an MS4 must devote resources to keep abreast of changing regulations and implementing NPDES programs, public education and enforcement.

3.2.6. Lack of Public/Policy Maker Awareness and Understanding of Needs

The first step in establishing a stormwater utility is determining the needs and calculating the associated costs. Once done, the bigger challenge may be communicating this need to the

municipality's policy makers and the community at large in a compelling way. "The most effective stormwater business plans recognize community expectations. In some cases, expectations must be elevated by convincing demonstrations that stormwater problems exist and can be solved. Stormwater management rarely captures public support unless problems impact the daily lives of citizens. Many drainage systems are underground and essentially invisible to the public. If they are designed, constructed, and maintained properly, most people are unaware of them. More visible problems such as potholes in roadways consistently rate higher than drainage problems. The most effective programs identify and publicize the problems they must address, seek public participation and support, and orchestrate the use of various tools and resources over time."[27]

This can be accomplished from the technical side with engineering and financial analyses. But moving public opinion is much more difficult and requires expertise not often found in the ranks of stormwater managers. A successful utility would employ public information personnel and develop an early branding effort from which is built a full public engagement program that can begin to move the opinion of both policy makers and the public at large.

3.2.6.1. New Paradigm

One additional, not insignificant, barrier to garnering support from policy makers and the public is the rapid change in how stormwater management has changed in the past three decades. These changes have been challenging for stormwater managers; it is no surprise that non-stormwater people are even more puzzled by the new emphasis on stormwater management.

"The character of the stormwater management function has, and continues to change significantly. Originally stormwater systems were built just for conveyance, but stormwater is now a component of a comprehensive integrated urban water resource, environmental enhancement, and recreational services system. Contemporary stormwater management is a multi-dimensional function which includes quantity and quality considerations, multiple-use facilities, riparian corridors, recreation, wetland preservation and creation, and groundwater recharge.

"The new paradigm has introduced a whole new array of issues that has resulted in basic changes in stormwater planning, design, operation and maintenance, construction, and financing. These changes have also resulted in greater public expectations."[28]

3.3. Section 1 Summary and Recommendations

Stormwater Programs face many challenges to developing the resources needed for delivering programs and projects required to achieve the goals of flood protection and clean water. Progress has been made on many stormwater funding fronts including many federal and state grant programs. While primary funding remains a local municipal responsibility, it is widely

[27] From *Guidance for Municipal Stormwater Funding*, National Association of Flood and Stormwater Management Agencies, 2006.
[28] From *Guidance for Municipal Stormwater Funding*, National Association of Flood and Stormwater Management Agencies, 2006.

recommended that any stormwater program or utility develop a portfolio approach to funding. A solid foundation for that portfolio should be a dedicated, sustainable revenue stream such as user fees, but it should be supplemented with a robust array of other funding and financing mechanisms such as grants, loans and other debt tools, partnerships, and multiple creative approaches utilizing the resources of other like developers and private interests.

The role of the federal government may be limited by comparison, but its presence is invaluable in helping education, training, and making all opportunities for meeting the challenges of funding available to all local programs.

3.4. Case studies

3.4.1. Prince George's County, MD (Yvette)

3.4.2. Los Angeles, CA (Jerry)

3.4.3. Philadelphia Water Department, PA (Pam/Andy)

3.4.4. Bellevue, WA

3.4.5. Griffin, GA

3.4.6. Four Local Municipalities, Bay Area, CA (Jerry)

3.4.7. Washington DC Stormwater Retention Credit Trading (Craig)

3.4.8. Gentilly Resilience District (Yvette)

3.4.9. ??? smaller city/Town funding through Streets/Public Works and funded by property taxes. Discussion of limitations due to lack of funding

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