

STORMWATER MANAGEMENT-CHALLENGES AND SOLUTIONS

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Abstract. Stormwater management has continued to pose new and growing challenges to cities and counties throughout the US and more particularly in Georgia. Aging stormwater infrastructure, development and growth, environmental impacts, and regulatory requirements create technical, fiscal, and institutional demands that require new approaches and resources.

Many Georgia communities are addressing these challenges and finding solutions and approaches that fit their particular needs. These solutions have certain common elements that are useful for other Georgia communities.

The authors share specific insights and lessons learned over the last two decades in working with many US and Georgia communities. More recent lessons from Georgia communities and the implications to other communities are discussed. The insights and lessons are relevant to all communities at any stage of program development.

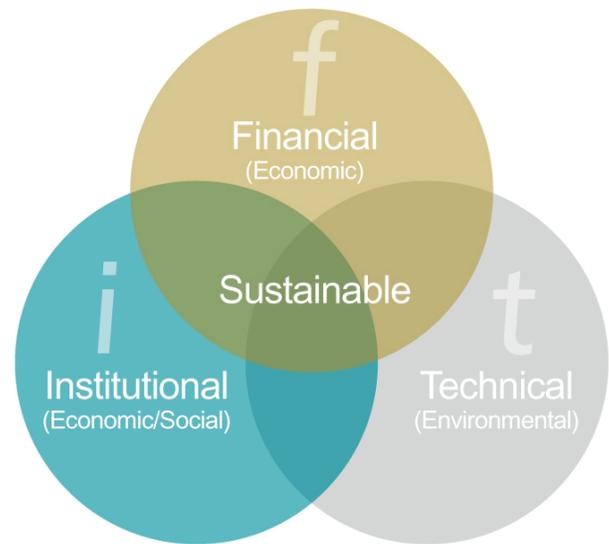
The authors provide insights on rate structure development in many Georgia communities along with comparisons and analyses of methods and structures used in Georgia.

STORMWATER MANAGEMENT IN CONTEXT

Any discussion of stormwater program funding must occur in context and perspective. Funding of the program and is incidental to the program itself and the fiscal plan for the program must be in balance with the institutional and technical dimensions of the program. A useful way of understanding this balance is represented by the “Venn” diagram following. The proper balance of these program dimensions represented by the common area yields a sustainable program. The technical/environmental issues balance with financial/economic issues, which also balance with the institutional/social issues to create an area of convergence and balance. This concept is also a useful paradigm for the successful development and implementation of program funding solutions.

The process of developing a stormwater funding mechanism must address the significant organizational, institutional, technical, and public issues attendant to what must be accomplished through stormwater management and in what manner. The process has common rules but custom results. Only after answers and consensus have been reached on what, how, who, where, to what extent, and how much in the context of the local governing politic can an appropriate fee solution be developed and implemented.

We have developed the acronym FIT (fiscal-institutional- technical) to describe this framework because **successful stormwater management programs FIT.**



FUNDING THE PROGRAM

The number of stormwater utilities has continued to increase over the last three decades as a practical and effective means of funding local government stormwater management. Their growth and

evolution has been a curious process driven by regional and local factors where success or failure is usually determined by a few important and common truths.

First Things First. . .

The motivation for implementing a stormwater funding mechanism varies. A stable and adequate funding mechanism can be a powerful attraction to a community short on cash and long on needs. In other cases, the fiscal management philosophy or style of a community may prompt the elected leadership to protect the community's bond rating. In other cases, the complaints and demands of the public or certain constituencies may prompt development of alternative funding sources. In still other cases, development pressures and increased expenses and staffing needs prompt a call for additional funding.

In the last decade, the protection of our water resources has brought the funding needs of stormwater management to the forefront of almost every community in the United States. Whatever the motivation or driving need, all successful funding plans share a common attribute: **The functional program guides the fiscal program.** In other words - **the program is first.** Funding arrangements that are not based on a defined, understood, and accepted stormwater management program will fail.

Everyone Has One. . .

Many communities look to other communities to copy their program prescription. This can be a huge mistake because no two stormwater management programs are alike. While it is true that stormwater management programs share many common functional elements, it is important to recognize that public perceptions, system differences, growth demands, environmental needs, and public policies are a unique mix. Because funding plans should be based on the particular program in each community, copying the funding plan or fee structure of another community is inappropriate and can lead to an unfavorable outcome.

Form Follows Function. . .

An old adage says "Form follows function," but in the lexicon of stormwater management, quantity (flood control) follows quality (water quality). The traditional focus of most stormwater management programs has been on flooding and drainage control. Often this is reactionary, superficial, and poorly funded. Water quality concerns and issues are more pervasive, sustained and not amenable to superficial, non-comprehensive solutions. A program focused on integrating water quality and water quantity issues is ultimately more balanced and more acceptable to the public. **Address water quality issues and, as a consequence, you will address water quantity issues.**

The resulting program will be balanced, viable, and sustainable.

Lead, Follow, or Get in the Way. . .

The larger vision, strategic posture, and expectations of the community tend to govern its direction and role in stormwater management. A common attribute of communities with effective stormwater management programs is community leadership at many levels that recognizes the need, sees the new and better future, and then leads the way. Most successful programs also have a "champion" who serves as the point in moving the program forward.

Importantly, there are many effective programs that sustain themselves without a stormwater service fee. Again, the key to this success is the focus on the program. The funding follows. On the other hand, there are programs that have put funding ahead of program and have found the stormwater fee in the way of an effective program.

In most communities, a great deal of work remains to be accomplished in defining the community's role in stormwater management. While the federal government and the states have prescribed many requirements, there is still much local flexibility in developing practical, effective, and economical programs. Leading and setting the pace take energy and courage. The risk and effort of community leadership can secure significant control of local needs and objectives.

Many Options, Fewer Real Choices

The stormwater funding conundrum has an analogous link with the hydro-logic cycle. Water evaporates, it rains, it floods, there is a cry for action, then there is evaporation (sometimes a drought) and the cycle repeats. Stormwater professionals have labeled this the "hydro-illogic" cycle. In the context of this conundrum, stormwater management needs are forced to compete with other **sustained** community needs like law enforcement, education, economic development, solid waste management, water and sewer, and many others. Breaking the cycle is a challenge.

Fees, Taxes, Grants

There are three basic types of funding available for stormwater management: grants, taxes, and fees. Grants involve the least degree of effort and local responsibility. Grant searches typically occur during the "cry for action" phase of the hydro-illogic cycle. The search for grant funding is also typically associated with the notion that the stormwater problem can be solved with a project or even a series of projects. Unfortunately, even if the grant is secured and the project or projects are built, the long-term needs of

stormwater management are not addressed and public perception is shifted further away from local and personal responsibility.

Taxes are the traditional source for funding most of the beneficial obligations of local government. Therein of course is the problem. How does stormwater management get its required share and how can it continue to receive funding year to year when the flooding is periodic, dispersed, and this is the period of drought?

Stormwater management programs funded by service fees continue to gain adherents and proponents. The attraction is that it provides the solution that ties the needs to the cause. The key is to have an adequate and sustainable funding source. Of the three basic types, grants, taxes, and fees, fees have the best potential and are becoming the mechanism of choice.

Many Georgia communities are finding that a stormwater service fee (also referred to as stormwater utility fee) is the preferred choice for because of the reasons above. Stormwater management programs funded through a service fee have the best and most sustainable fiscal foundation.

Several Georgia communities have adopted or are in the process of implementing a stormwater utility fee. This paper will examine those that the authors have direct working experience with.

DEVELOPING THE RATE STRUCTURE

Development of the rate structure is a technical process that relates closely to the technical and institutional dimensions of the stormwater management program.

A careful and planned process of development and implementation is vital to successful implementation. Some recent examples and reversals bear out the need for an approach that leans on the process and not on preconceived fee schemes. While it would seem that out of the hundreds of programs that employ a stormwater fee funding approach, one only needs to pick one. Nothing could be more perilous. One size does not fit all. The utility approach after all is not just a fee scheme. It is a funding solution based on the unique programmatic, institutional, and cultural expectations of the community reflected in the particular stormwater management program.

“The good, the bad, and the ugly” has characterized the development process for many stormwater management utilities. The good aspect is what most supporters of the service fee concept readily embrace. It is a sensible, responsible, practical, fair, economically elastic, and a singularly sufficient way to fund a stormwater management program.

The bad news, as viewed by some, is that it is not free or immediate. A proper development process and implementation take some time and will require the allocation of resources, both financial and human. The good news is that the allocation of adequate resources and sufficient time will provide a strong underpinning for adequate long-term funding. The development expense is small in comparison to the value of the revenue stream. In most cases the cost of development is recouped within a few months.

Successful development of stormwater utilities requires a public process. Public processes are not as neat and concise as the technical content of rate making would imply. It is important that a public body of sufficient size and representation be organized and charged with the management of the rate-making process. This is not a process to be left exclusively in the hands of the information and technical people. The process can be a positive engagement of the community and can help clarify issues and public expectations.

One thought needs to be kept prominent during the entire timeline of a stormwater utility: **“You will be challenged.”** There is no such thing as a perfect stormwater rate structure or, for that matter, any perfect utility rate structure. Some are just more acceptable than others. This is not to say that they are somehow fatally flawed; they are at best a fair and reasonable representation of the cost of the service provided distributed over the various classes of users. A balance between significant accuracy, cost of development and administration, and equity is a balance. Changes in the weight placed on any one of these will shift the balance points.

Rate Methodologies

As stated before the development of an appropriate rate structure for any community is a measured, deliberate process that can be very technical. The challenge is to simplify and demystify the process so that community decision makers and the public understand the final structure and deem it to be fair and balanced.

Understanding that the fee for stormwater service is developed on the basis of the costs of service is fundamental. The next step requires that some metrics be used that readily relate to those costs. In the case of other utilities such as water or electricity, the measures are direct and readily quantifiable on the basis of the particular product delivered, like gallons of water or kilowatt-hours of electrical power. In both of these cases additional metrics may be utilized to further increase equity and balance fees with the cost of service. Such things as load factors, time of service, progressive rate structures, and service classes are applied to balance costs, promote conservation, and

enhance equity. In the case of wastewater utilities, it is usually impractical or uneconomical to meter the wastewater discharge, and therefore, the surrogate measure of water consumption is utilized.

Runoff volume and rate are determinants of the cost of physical infrastructure that must be built and maintained to accept, convey, control, and direct stormwater runoff. There is no practical direct way to meter runoff from any particular parcel of land and therefore, as with wastewater management, a surrogate measure is needed.

The physical size and surface characteristics of the land parcel receiving rainfall and the volume of rainfall determine runoff volume and rate. Rainfall within a management unit over any extended period is uniform and not a discriminating factor between parcels. The primary land features that control and determine the volume and rate of stormwater runoff are the size of the parcel served and the intensity of development of the land parcel as determined by its imperviousness. Parcel area and imperviousness are the two primary surrogate measures employed in the determination of runoff volume and rate and in the establishment of specific parcel fee assessments.

The funding issue is “what measure is available that is indicative of the cost of this activity?” Is there a rational nexus? The answer is yes. It lies in understanding the primary factors affecting the quality of runoff from any given parcel in the same sense and perspective as water quantity.

There is a convincing and accepted body of knowledge that indicates that water quality related to stormwater runoff is determined by land use and the intensity of development of the land. Such things as imperviousness and the character of activity on the land directly influence water quality of both the runoff and of receiving bodies of water. Imperviousness is obvious in the case of rooftops and paving but less apparent in areas with compacted soils and areas stripped of trees. There is also a strong correlation between imperviousness and the character of land use. Highly impervious areas are also associated with land uses that include practices that further contribute to the degradation of water quality. Therefore, it is proper and appropriate to use imperviousness and land use as surrogate measures of water quality.

The dominant metric used on Georgia and throughout the US in assessing a stormwater fee is the amount of impervious area attributable to a particular parcel of property.

While imperviousness is the dominant metric, other metrics such as the size of the parcel, or the land use, or the intensity of development, and the number of parcels have been considered and used to establish a

rate structure and to determine a specific fee for each parcel.

Within these options the program level of service and costs of service, as well as the availability and quality of the parcel database and the choice of billing bear directly on the rate structure and the specific fee.

This paper focuses on specific rate methodologies used in Georgia with discussion and analysis of the rationale, advantages and disadvantages, comparisons, and suggestions for other communities interested in developing a service fee funded stormwater management program.

The following questions and issues are addressed and analyzed with specific examples.

- Impervious area...Why and what is it?
- What units of imperviousness should we use?
- What is an ERU...or is an IU?
- Should we allocate some costs to the size of the parcel?
- What role does a credit policy have in rate structure?
- What is the best way to assess residential property?
- How do you determine residential fee tiers and why?
- What about exemptions?
- What about hardship cases?
- Should we make distinctions about location?
- What is the revenue capacity of the fee?
- What fees are charged by others?
- Does the fee cover the entire program cost?