Creating a Solution

The essence of leadership in any polity is the recognition of real need, the uncovering and exploiting of contradictions among values, the reorganization of institutions, where necessary, and the governance of change.
James MacGregor Burns, Historian

To effectively respond to stormwater problems, we should take a holistic, systems approach.
Borough and Township Staff, Lancaster County, Pennsylvania, 2013

Creating a solution for stormwater management involves identifying gaps between: (1) how your jurisdiction currently operates – as revealed by the understanding and evaluation of your existing stormwater management program; and, (2) your target level of services – as determined by your anticipated needs. To close the gap between the two will require resources. Thus creating a solution also involves developing a budget, estimating your future revenue needs, and finding ways to pay for the solution. Phase II jurisdictions intent on complying with their permit will want to analyze actions needed to take on each MCM that your permit requires: Public Education and Outreach; Public Participation and Involvement; Illicit Discharge Detection and Elimination; Construction Site Runoff Control; Post Construction Runoff Control; and Pollution Prevention and Good Housekeeping. Unpermitted jurisdictions will assess what actions are needed to achieve community values and goals. All communities will want to consider technological fixes for the near future and water-sensitive planning and urban design for the longer term. All jurisdictions will also want to take into consideration the risks being imposed on communities by the warming of our atmosphere, including increased probabilities for extreme precipitation events and for storm surges in coastal areas.

To a significant degree, creating a solution for your stormwater management problem can utilize economic tools (Nees, 2013). Improved stormwater services may provide economic consequences – such as new jobs and higher incomes – for your community, and these can be estimated by using input-output analysis.[7] Using cost-benefit analysis, you can compare program options to determine the soundness of optional investments. And cost-effectiveness analysis is useful for analyzing how well a BMP or set of BMPs would achieve a desired goal. To apply cost-effectiveness analysis in a Phase II community, for example, you would, as suggested by Reese (2013):

1. Define what your jurisdiction must do to bridge your program gaps, keeping in mind the need to have a program under each of the six MCMs;
2. Define the universe of possible solutions with the end product being a set of BMPs or more preferably a set of environmental conditions; note the costs that would be required to implement options in the set, so as to eliminate inefficient solutions;
3. Ask, for the remaining options, if the increment in environmental benefit that each would provide is worth its incremental cost, and eliminate those for which it is not; and,

[7] The Environmental Finance Center at the University of Maryland uses an input-output model called "IMPLAN" to estimate community or regional economic impacts of stormwater programs.

4. Configure the program by blending the remaining BMPs into a cohesive set, seeking synergy and practicality.

Likely, creating a solution will involve many meetings, usually small ones, in which you consciously aim at finding answers to your problem. A three-part search process has proven useful for solving many public policy issues, and it should help you identify a solution for your jurisdiction's stormwater problem (Bryson and Crosby, 1992). The parts are:

1. Scan broadly for ideas and examples that go beyond normal search channels;
2. Conduct a narrow-gauge search for specific components of optional solutions; and,
3. Combine the two into a detailed prediction of the consequences of your options.

Conducting a thorough search for a preferred program solution will have several benefits for your community. It will avoid "satisficing" behaviors such as conducting a search that is too simple, short, or shallow; or latching onto the first solution that comes anywhere close to solving the problem. It will help you refine and re-conceptualize your situation. And it will enhance the boundary-spanning ability of participants; that is, it will help stakeholders to put themselves into the others' shoes.

Determining Costs

The suite of activities you identify for your preferred program will require resources. For each action in your program, there will be a related cost. Projecting a ten-year budget is a useful method to estimate resource allocations. As shown by Throwe (2013) your estimate for costs should take into consideration:

1. Capital projects – both gray and green BMP investments and, perhaps, projects to reduce your impervious surface area;
2. Personnel;
3. Operations and maintenance; and,
4. The support equipment, technology and materials needed for day-to-day operations.

To arrive at true costs, some allocations must be estimated from the budgets of related programs such as planning, environmental protection, wastewater treatment, parks and greenways, and roads. There may be opportunities to reduce costs by engaging the public in implementation, such as by offering incentives for private landowners to install BMPs on their properties, collaborating on educational efforts with groups whose missions are to improve the environment, or partnering with other jurisdictions, and thereby achieving economies of size for your program (Reese, 2013). Ultimately, you will arrive at a total estimate for the net cost your jurisdiction will bear for an improved stormwater management program, and you can then ask the question, "How are we going to pay for this?"

Review of Stormwater Management Costs. In the urban environment, it is often difficult to find appropriate property and unconstrained physical space adjacent to individual development projects to mitigate water quality impacts. This problem is especially acute in areas where land development, utilities, and other infrastructure severely restrict the feasible construction of water quality treatment.

In such areas, as an alternative, reliance is often placed on installing underground manufactured treatment devices, which have specific maintenance requirements and can be very expensive. Location of on-site treatment is often not compatible with existing landscapes or land use contexts. Finally, the proliferation of many small water quality mitigation sites results in questionable environmental benefits, substantial project development and regulatory review cost and increased demands for maintenance.[8]

The stormwater management requirements associated with the Chesapeake Bay restoration effort will exacerbate these issues in urban communities. In order to reduce overall implementation costs to the maximum extent practicable, it is necessary to understand the factors and variables that influence the cost of stormwater best management practices (BMPs). We begin with a look at specific cost categories, followed by an analysis of the variables that influence specific BMP costs.

Cost Categories. Based on review of the literature, we have separated the total cost of stormwater BMPs into the following categories: land costs, pre-construction, construction, capital costs, operation and maintenance, and program administration. These cost elements encompass the majority of costs associated with stormwater BMPs.

Land: Managing stormwater in urban areas is complex and potentially expensive for a variety of reasons, not the least of which is the cost and limited availability of land. In fact, the cost of land is often the most significant variable impacting stormwater BMP costs (see EPA 1999). Clearly, land costs can vary widely among communities (see King 2011), as well as within communities. As a result, land costs can significantly influence the potential impact of market tools such as stormwater banks and in-lieu fees.

In general, land valuation is based on an estimate of the *highest and best use* of the land, i.e. the use of the land that is reasonably probable, legally permitted, physically possible, economically feasible and results in the highest value for a property. The estimated market or appraised value of land can vary, significantly at times, from the *value-in-use* and the *investment value* of land. The *investment value* of land is the value of land to the owner or prospective owner for investment or operational objectives, and the *value-in-use* is the value to one particular user of the net present value of the cash flows that the land is expected to generated for a particular activity under a specific use. These differences between investment value, value in use, and market value of land provide motivation for buyers and sellers trade in the market place.[9,10]

Key components of land costs include:

- Easement costs. Projects that are installed on private lands without fee simple purchase will require a property easement to ensure adequate operations and maintenance (O&M) over the life of the practice. This results in two corresponding cost issues. First, eased

[8] *Water Quality Mitigation Banking.* Final Report. December 2009. Submitted by: Anil K. Agrawal,The City College of New York, New York, NY 10031; Andreas Fekete, RBA Group; Fred Scherrer, RBA Group; Bryan VanderGheynst, RBA Group. Region 2 Transportation Research Center.

[9] Joseph F. Schram, Jr. (January 2006). Real Estate Appraisal. Rockwell Publishing. P 36. ISBN 978-1-887051-25-5.

[10] International Valuation Standards, 2011.

property must always be restored to as-good or better condition after O&M activities. Second, an easement essentially results in loss of use or loss of development rights to the property owner.

- Opportunity costs. An opportunity cost is the cost of an alternative that must be forgone in order to pursue a certain action. As it pertains to the valuation of land, the opportunity cost of land is the cost to the owner of giving up the utility generating uses of the property when the land is taken out of service. In a stormwater setting, opportunity costs are associated with the devaluing of land when it is taken out of service and is repurposed for stormwater treatment with regards to previous or potential land use. The derivation of opportunity costs involve making an assumption that a property owner faces increasing opportunity costs for land that is taken out of service for other uses (Thurston 2006).

  The opportunity cost and associated value of land is often not considered in many BMP cost assessments, and as a result, BMP cost estimates are often significantly undervalued. However, it is important to distinguish between land valuation, opportunity cost and accounting or realized cost. The King and Hagan report correctly incorporates the value of developable land—either public or private—into BMP cost estimates. However, developable public land only becomes an accounting or realized cost if the forgone activity would have actually occurred and would have resulted in some sort of revenue or cash flow to the community. Many publically financed best management practices are installed on lands that are technically developable but are not slated for development in the foreseeable future, if ever. Therefore, there is no revenue cost to the community.

- Land acquisition and transaction costs. Acquisition costs are site specific and depend on the type of BMP being installed. Components of the cost to acquire land include time to identify land, legal fees, commissions and brokerage fees, title search fees, appraisal fees, governmental fees, and settlement fees.

Pre-construction costs: Before construction can begin, remediation sites have to be prepared. Pre-construction costs are incurred before the BMP can be installed, and include: surveying; design work; permitting; geotechnical testing; and transaction costs, including legal fees, time to acquire and identify project site, and land acquisition (addressed above).

Site conditions significantly influence pre-construction costs associated with urban best management practices. Mitigation projects in urban environments often require significant site preparation, including demolition activity. Finally, as with any permitted construction activity, there are sediment and erosion control activities that must be accounted for including silt fencing and sediment trapping. Pre-construction costs average between 10-40 percent of overall construction costs (see King and Hagan 2011).

Construction: The primary cost of any best management practice is the actual construction and installation. Construction costs consist of the cost of excavation, primary erosion and sediment control, control structure installation, appurtenances costs, landscaping, and BMP specific installation costs. Expenditures for professional and technical services required for the construction of the stormwater BMP are also included in construction costs. Construction costs are dependent upon the BMP being installed, and can vary widely (see King and Hagan 2011).

As with pre-construction costs, site conditions have a significant impact on the variability of construction costs. Hydrology, soil type, and topography can result in significant variations in construction costs from site to site, which will potential impact banking and in-lieu fee programs.

Cost of capital: Cost of capital must be considered for any capital project, such as stormwater management. Cost of capital is defined as the opportunity cost of the funds employed as the result of an investment decision; it is equivalent to the rate of return that a business or institution could earn if it chose another investment with equivalent risk. Included in the cost of capital calculation is the cost of debt. King and Hagan used a uniform rate of 3 percent over a 20-year borrowing period. Please note that the cost of capital can vary from site to site or institution to institution, depending on the party securing the credit and also depending on risk differences.

Operations, maintenance, and asset management: Operation and maintenance costs (O&M) are post-construction activities that provide upkeep for stormwater BMPs. Re-occurring annual costs include site inspection during and after construction, labor, materials, energy, landscape maintenance equipment, structural maintenance, dredging, disposal of sediments, and litter removal. Additionally, determining O&M costs requires an estimate of the useful life of the BMP, as well as an estimation of the discount factor to be used in the derivation of an annualized BMP O&M cost. The level of O&M required will depend on the complexity of the BMP. Erickson et al. (2009) performed a survey of stormwater BMP maintenance practices and found that constructed wetlands and porous pavements required more informed maintenance than other BMPs because of the level of complexity of the technology. Typically, O&M costs are estimated as a percentage of base construction costs, ranging from <1-20 percent depending on BMP and level of maintenance adopted (EPA 1999). Over time, operations and maintenance costs can actually approach the level of initial construction costs.

O&M costs actually represent one of the key benefits associated with stormwater banking and in-lieu fee programs. Though it is important to incentivize onsite mitigation to the maximum extent practicable, many advanced best management practices, including small scale green infrastructure projects, can require significant operations and maintenance, which can be difficult and expensive to monitor for performance. By consolidating many small scale disturbances into a large-scale BMP, local governments can significantly reduce O&M costs while at the same time ensuring the long-term performance of the project.

Additionally, determining O&M costs requires an estimate of the useful life of the BMP to be made and as well as the estimation of a discount factor to be used in the derivation of an annualized BMP O&M cost.

Stormwater asset management: A key component of an effective operations and maintenance system is infrastructure asset management. Once a community has installed infrastructure to handle its stormwater, the next step is to manage the stormwater infrastructure in the best way possible to ensure the assets are kept in proper operational order, will last as long as possible, and are replaced when necessary. This type of management is called “Asset Management.” Asset Management represents a way of thinking about assets in a strategic way

so that they are sustained over the long-term at the lowest overall life cycle cost while meeting the needs of the community.

Although it may sound complicated, it doesn't need to be. Asset management is a self-educating process and can be done by any organization. The process relies on what you already know about the assets and uses the resources available to you. Just starting the process is the best way to learn about asset management. Because it is an on-going, long-term process, it is always possible to make adjustments to the asset management activities over time. See ***Appendix C*** for a more thorough discussion of the benefits of stormwater infrastructure asset management and the processes for establishing an effective and sustainable asset management program.

Revenue and Funding Options and Criteria

There are many revenue and funding sources for added stormwater services, including: fees for review of permits and development inspections; general property taxes and special district assessments; grants; loans; and utility fees. Some sources are appropriate for meeting capital costs, some for operations and maintenance (O&M) costs, and some for both (Throwe, 2013). Table I illustrates five options and their potential use in meeting capital and O&M costs:

TABLE I

Funding Options for Stormwater Programs

SOURCES OF FUNDING	CAPITAL COSTS	O&M COSTS
Bonds	Yes	Yes
Fees for Permit Reviews and Inspections	No	Yes
General Property Taxes and Special District Assessments	Yes	Yes
Grants	Yes	No
Loans	Yes	No
Utility Fee	Yes	Yes

In deciding which funding source, or combination of sources, to use, local officials can apply criteria for their choice by answering the following questions (National Association of Flood and Stormwater Management Agencies, 2006):

1. Is it legal?
2. Is it equitable in the sense that: (a) it is proportional to the level of services that payers receive; and, (b) that it takes into consideration the needs of special groups of payers?
3. Is it sufficient to meet costs?
4. Is it flexible (adjustable to changing conditions)?
5. How costly is it to administer during the initial set up and for ongoing oversight and maintenance? (For example, what are the data requirements, and how compatible is it with existing data processing systems?)

6. How consistent is it with other local funding and rate policies?
7. How stable a source of revenues is it? and,
8. Can it be used to create opportunities and incentives for payers to reduce their contributions to stormwater by changing their behavior?

There are, again, a variety of mechanisms that municipalities can use to fund their stormwater programs. The two most common funding options, general fund appropriations and stormwater service fees, are discussed below.

General Fund. Most communities have traditionally funded stormwater management from taxes paid into their general funds. The general fund is a government's basic operating fund and accounts for everything not accounted for in other funds, such as a special revenue fund or a debt service fund. There are, of course, advantages to using general funds to support stormwater programs. Most communities have established revenue and debt programs, which makes the process of supporting new and expanding programs familiar and uncomplicated. In addition, financing through the general fund allows local leaders to consider stormwater financing relative to other community priorities. There are, however, several significant drawbacks to expanding stormwater management activities through general fund financing.

In most communities there is great competition for general fund dollars between municipal programs; using the general fund revenues to support growth in stormwater obligations requires communities to either increase taxes or divert existing resources to the stormwater program. Compounding resource availability issues is the fact that stormwater management improvements typically have a low priority in many communities, unless the municipality is reacting to a recent major storm event or regulatory action.

Another deficiency of financing stormwater management through the general fund is the lack of transparency of the general fund financing system. The total cost of stormwater management is not readily apparent when these costs are dispersed among general fund departmental budgets. This is especially true in those communities that do not have stormwater programs with clear budgetary authority, which makes it difficult to determine where financing decisions related to stormwater management are being made. In addition, as stormwater management costs increase, general fund budgets are often not increased in parallel to meet those needs.

There is also the issue of equity and fairness in the financing system. Tax-exempt properties do not support any of the cost of stormwater management, even though it can be shown that many of them, such as governmental properties, schools, colleges, and universities are major contributors of stormwater runoff. Finally, general funds are primarily supported through property taxes, which are based on assessed property value. The cost of stormwater service to individual properties bears no relationship to the assessed value of the property. Therefore, this method of recovering stormwater management costs is more often than not inequitable.

Stormwater Utilities

Many local governments that are responsible for stormwater management continue to face escalating costs at a time when General Fund revenues are either stagnant or declining. To address this challenge, many communities are creating stormwater utilities to provide

dedicated funding for this critical community service.[11]

A stormwater utility is a financing mechanism that imposes user-service fees on owners of properties that create runoff; the utility is administered separately from general property taxes. Many local governments across the country are shifting their stormwater financing from management from (often) disaggregated general fund supported programs to fee-based enterprise programs and/or utilities. In the 1970s stormwater utilities were viewed as novelties in a few western states; by 1994 there were about 100 utilities; and by 2013 the number had increased to more than 1,400 utilities, across 39 states and the District of Columbia (Western Kentucky University, 2013). With the number of MS4 permits growing, and, in the Chesapeake Bay Region where WIPs being imposed by the Bay states, the number of stormwater utilities can be expected to grow at an increasing rate.

Stormwater utilities and enterprise programs provide several distinct advantages over tax-supported programs. Unlike taxes, utilities:

1. Are more equitable in the sense that they can be used to link fee levels to the service benefits that payers receive;
2. Can provide an opportunity and incentives for payers to reduce their fees by installing BMPs on their properties;
3. Can be dedicated to stormwater services only, and need not compete for allocations with other programs and obligations; and,
4. Can be designed to obtain payments from tax-exempt properties – such as churches, hospitals, public properties, and schools.

In most states, stormwater utilities are legal, although in some, they require special voter approval. The legality of utilities has been challenged in courts of law, but when the utilities meet certain legal standards, almost invariably their lawfulness has been upheld. The operative legal standards are: (1) the fees charged must be fair and reasonable; and (2) the fees must bear a substantial relationship to the cost of services and facilities (American Public Works Association, 2003).

It can be useful, in establishing a stormwater utility, to think of it as an "umbrella" under which your community can address its local stormwater problems, priorities, and practices (National Association of Flood and Stormwater Management Agencies, 2006). No two umbrellas are identical. Your stormwater utility, should your search for a solution to your stormwater problem lead you create one, can be used to generate funding that is adequate, stable, equitable, and dedicated solely to stormwater functions. It can be a vehicle for coordinating or consolidating stormwater responsibilities that have been dispersed, previously, among several departments. And, it can help you to develop a program that is comprehensive, cohesive, and consistent, year-to-year.

If you decide to recommend a stormwater utility to decision makers and the public in your jurisdiction, your design of this solution should provide answers to the following questions (New England Environmental Finance Center, 2005):

[11] 2012 Stormwater Utility Survey. A Black and Veatch Report. Page 4.

1. What expenses will it cover?
2. What will be the start-up strategy?
3. What organizational structure will be used to administer it?
4. How will it be implemented? And,
5. How will user fees be structured?

Structuring user fees is a technical effort that involves considerations of the bases for fees, fee levels, approaches to different types of property, exemptions, and credits. If you are already knowledgeable about the basic functions of stormwater utilities, you may want to read Appendix C, which contains a technical note about structuring utility fees. Experiences across a variety of utilities and documented by the American Public Works Association (2003) provide guidelines for structuring fees. The guidelines are that fees should:

1. Be tied in a reasonably accurate and technically defensible manner to a measure of the impervious area or other indicator of runoff volumes from property parcels;
2. Utilize an accurate database for determining charges and preparing bills;
3. Distinguish among classes of properties – such as residential, commercial, and industrial – to reflect differences in stormwater services they require;
4. Distinguish within classes to set fees in proportion to the contributions that parcels make to the total runoff generated by their class;[12]
5. Be legally and politically acceptable;
6. Provide a procedure for appealing charges;
7. Be flexible in the sense that they can be modified with a reasonable amount of effort;
8. Generate adequate revenue to meet program costs; and
9. Require no more than reasonable expenses to implement.

In practice, most stormwater utilities charge fees for government property and for tax-exempt properties such as churches, hospitals, and schools, but some provide partial credit for tax-exempt properties. Some utilities also charge for agricultural and undeveloped land. Some offer rebates for categories of users such as churches or the elderly. Most give credit for the installation of on-site BMPs that detain, retain, or store runoff, but some set a maximum percent for the credit and limit it to a certain number of years. Some offer credit to schools that provide education about stormwater management. Variations reflect local community values and confirm there is not a one-size rate structure to fit all communities.

Enterprise fund accounting.[13] A stormwater utility relies on an accounting system or process known as an enterprise fund. An enterprise fund is a form of accounting that utilizes a separate fund or cost center for a specific purpose.[14] Enterprise funds are generally sustained by revenues generated within a specific department. Under enterprise accounting, the revenues in

[12] Note, however, that using a flat fee instead of distinguishing among properties within a class requires less internal capacity to structure the fee system, reduces the burden of administration, and minimizes the risk of billing errors (Throwe, 2013; see also Appendix C). The key question is: "How much variation in stormwater contribution is there among parcels within the class?"

[13] This section was adapted from the website the Pioneer Consulting Group website: http://www.municipalconsultants.net/enterprise_fund_accounting_systems.aspx

[14] http://www.waynegov.com/site/default.aspx?PageType=19

expenditures of services are separated into separate funds with its own financial statements, rather than commingled with the revenues and expenses of all other government activities. Common types of enterprise funds are public utilities including water, wastewater, trash disposal, and increasingly stormwater management.

Establishing an enterprise fund does not create a separate or autonomous entity from the municipal government operation. The municipal department operating the enterprise service continues to fulfill financial and managerial reporting requirements like every other department.

The Enterprise Budget. Once an enterprise fund is enacted, a budget is usually subject to the appropriation process. The enterprise budget includes both revenue and expenditure estimates.

Revenues: Similar to any operating department, revenue estimates are prepared. These may include user charges and fees, investment income, and any other enterprise revenues. Enterprise revenues are often required to be used to support the expenditures of the enterprise fund only, rather than to support ongoing municipal operations or subsidize the general fund. However, this restriction varies from state to state. In some jurisdictions, enterprise revenue can be transferred to the community's general fund with the support of the appropriate governing bodies.

Costs: The costs associated with operating a stormwater enterprise fund are varied and encompass a broad spectrum of administrative, environmental, legal, and capital functions, including:

- **Direct costs** are those associative directly with the enterprise fund. Generally these include salaries and wages of the enterprise employees, other operating expenses and contractual payments. These expenditures will be appropriated in and incurred directly by the enterprise fund.
- **Indirect costs** are those costs that cannot be directly or exclusively assigned to one service. Enterprises often benefit from expenditures made by the general fund. For example, the collector, whose salaries paid by the general fund, make process enterprise user billed payments. We recommend that these indirect costs be identified and allocated to the enterprise fund using clearly established formulas to prorate the expense among departments.

  Because indirect costs are appropriated in the general fund, and operating transfer is made by the auditor/accountants to reimburse the general fund from the enterprise fund. Ideally, these operating transfers are made monthly to ensure that the enterprises transferring revenues to provide for the general fund expenditures as they are made. All operating transfers from the enterprise fund are credited to the general fund's cash account; at no time is an operating transfer made to replenish an operating department appropriation.
- **Employee benefits** include health and life insurance, FICA and medical expenses, workers compensation, unemployment insurance, and pension and retirement costs. These expenditures are generally budgeted in the general fund (or insurance trust funds) for all

employees, including those of the enterprise fund. Therefore, the enterprise portion of these expenses, like the indirect costs, must be allocated to the enterprise fund.

- **Legal and borrowing costs** may be appropriated or budgeted for directly in the enterprise on area. These include debt service costs (principal, interest and temporary borrowing costs), bond counsel expenditures relating to an enterprise debt issuance and/or financial service costs relating to a bond and the bonded prospectus. Alternatively, these expenditures are currently provided for in the treasurer's or debt service budgets and must be allocated to the enterprise fund appropriately.
- **Capital expenditures or improvements** are items generally found in a capital budget such as construction or major repairs, equipment or acquisitions. While these items may be reviewed and recommended generally by the capital planning committee, it is advisable that the capital expenditures for the enterprise are voted separately from the general fund's capital expenditures.
- **Emergency reserve**, like the general fund reserve fund, there is an appropriation available to meet unanticipated spending needs that may arise during the course of the year and require immediate action. Following the same guidelines set forth in the general fund, the reserve may be transferred by the city council/finance committee action rather than having to wait for the next scheduled legislative meeting. There should be no direct charge for the emergency reserve rather the auditor/accountant should transfer the amounts to the line item as stated in the approved transfer. At the close of the fiscal year, any remaining balance in this emergency reserve would close to the enterprise fund balance.
- Another cost of the enterprise not included in the operating budget is **depreciation** of the fixed assets and infrastructure. While it is not a budgetary item, depreciation should be considered by the community when preparing a cost analysis to determine charges and fees. Depreciation is calculated in order to recognize the annual expense associated with the use of an asset is a given reporting period. In general, depreciation is calculated by dividing the purchase price of the asset by its useful life. If the asset has outstanding debt and a debt services is already budgeted, depreciation is not included in the costing analysis because it would result in a double counting of expenses.

What are the Advantages of Enterprise Fund Accounting? A community may account for a certain level of services in the general fund, special revenue fund or an enterprise fund. The advantages of using an enterprise fund rather than the other two methods are as follows.

- *Demonstrate total cost of service*: With all the direct, indirect (e.g., interdepartmental support, health and insurance costs) and capital cost of providing the service in a consolidated fund, the community will be able to readily identify the true cost of providing a service, in this case, for water supply, storage and distribution.
- *Provide useful management information:* With the consolidation of revenues and the cost of services and information on the operating performance (positive or negative) of the fund, the community will have useful information to make decisions on user charges and other budgetary items. The community will be able to analyze how much the user fees and charges support the services and to what extent if any tax levy or other available revenues

are needed to subsidize the enterprise fund. The community will also be able to include the fixed assets and infrastructure of the enterprise as assets in the financial statement and recognized the annual depreciation of these assets.

- *Retain investment income and surplus:* Unlike services operating in the general fund or a special revenue fund, all investment earnings and any other operating surplus is retained in the enterprise fund rather than returned to the general fund at year-end. Once a surplus is certified as available (similar to free cash), it may be used to fund operating, capital or debt service costs associated with the enterprise.
- *Provide better ability to implement capital improvements:* The enterprise fund will allow the Department providing the service to better plan for and implement capital improvements, because these needs can be forecasted and integrated into the long-term financial management of the Department.

Lessons Learned

The Charles River Watershed Association (CRWA) investigated stormwater utilities adopted since 2005 in three New England municipalities – Newton, Massachusetts; Reading, Massachusetts; and South Burlington, Vermont – and the results of the study offer examples and lessons for other jurisdictions that are considering forming a stormwater utility (CRWA, 2007):

> **Newton, MA** established a fee structure, in only five months, with just two classes of properties – residential and other – and without distinguishing among types of properties within the residential class because analysis of a random sample of residential properties by the city's staff showed the range of impervious surfaces among such properties was small. The elderly are eligible for a discount, and, at the time of the study, the municipality was developing a credit program for BMPs that provide groundwater recharge. Fees are added to water supply bills, which are issued quarterly, and administration of the utility is housed in the engineering division of Newton's Department of Public Works.
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> **Reading, MA** established its utility with the advice of representatives from several town committees and the general public. The city used high resolution ortho-photography to analyze the impervious area of parcels within its boundaries. The average impervious area for residential parcels was determined to be an "equivalent residential unit" or ERU. (For a detailed definition of ERU, see Appendix C.) Fees for single and two-family homes are set at a flat rate. Fees for multi-family, commercial, and industrial properties are based on their amount of impervious area, divided by the ERU. Undeveloped land is not charged a fee. Utility fees go into an enterprise fund, which, with additional contributions from general tax revenues, pays for the city's entire stormwater management program. Fees are added to the water bill, which is issued quarterly.
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> **South Burlington, VT** covers an extensive area and contains numerous property types, sizes, and land uses. Staff from the city's Department of Public Works and Planning Department led the design effort for the utility. The staff involved:

a. A consulting firm to determine the budget for existing stormwater services being provided by the municipality;
b. A stormwater advisory committee to establish priorities and estimate a proposed budget for improved services; and
c. A technical advisory team that used satellite imagery to determine impervious areas of property parcels and geographic information systems (GIS) technology to estimate an ERU and fees for each parcel.

The fee structure involves a flat fee for single family homes. Multifamily, commercial, and industrial properties are charged according to their percent of imperviousness, calculated as the number of ERU for each property. The city offers credits for BMPs and for educational programs. Fees are added to the quarterly water bill. South Burlington administers the program by means of a stormwater division, which was created within the city's Department of Public Works.

The Charles River Watershed Association concluded its study of the three municipal utilities with several recommendations, based on lessons learned:

- To avoid the need to make major modifications and adjustments later, take an adequate amount of time to plan for the utility. Newton's five months to start-up meant no credit procedures were in place when the utility began, and some commercial and industrial property owners questioned the equity of rates, which they viewed as having been hastily conceived. Significant amounts of time are needed to investigate the budget for current stormwater services, to create an equitable rate structure to generate the amount of revenue need for the preferred program, and to establish needs and priorities of a stormwater program for the community.[15]
- Internal and public education should be provided prior to start up. Staff training is needed once a plan for administration of the utility is developed; coordinating the administration of credits across city departments, for example, was a particular challenge for the municipalities that offered credits. Also, if fees are applied to city-owned property, departments operating on parcels of city land should be informed, prior to when fees are issued, about why they need to contribute from their budgets to the utility. Public education is needed to explain the rationale and method for fees, particularly prior to the first billing.
- Fees that use the amount of impervious surface area as a significant factor provide a stable revenue source.

Additional Lessons

- Within a watershed, no local jurisdiction can do effective stormwater management alone. **Borough and Township Officials, Lancaster County, Pennsylvania**
- Having a sustainability plan in place for our jurisdiction complements our effort to reform stormwater management. **Town Officials of Bel Air, Maryland**

[15] Ideally, much of the work to establish the needs and priorities for stormwater management in the community will have been done while gaining an initial agreement and formulating the problem.

- Stormwater management should involve public-private partnerships whereby private landowners become engaged because they see it is to their advantage to do so; they see stormwater management as a way to increase the value of their property; and both parties share information and, therefore, build trust. **Borough and Township Officials in Lancaster County, Pennsylvania**

When you have created a solution to upgrade and finance stormwater services for your jurisdiction, you will need to concentrate on communicating with decision makers and the public to develop the political support your solution needs to become official policy.