Stormwater Utility Handbook

A Step-by-Step Guide to Establishing a Utility in Coastal Georgia

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Contents

Foreword

This stormwater utility handbook is designed to provide a concise step-by-step process to help local governments in Georgia develop stormwater utilities. Although the document has a particular focus on coastal communities, the guidance can be applied throughout the state. Section II addresses the interconnection between a jurisdiction's comprehensive stormwater management program and the setup of a local stormwater utility. Section III provides an overview of the typical step-by-step process used to establish a stormwater utility. Section IV includes conclusions, additional resources, and contact information for jurisdictions in Georgia that have successfully implemented stormwater utilities.

This handbook is intended to:

- Assist coastal communities in Georgia with the development of effective stormwater management programs to address local stormwater management needs.
- Assist with funding local stormwater programs via a stormwater utility.

This document is a result of a larger initiative to create effective stormwater management tools in coastal Georgia. A focal point of this initiative is the development of The Coastal Stormwater Supplement (CSS) to the *Georgia Stormwater Management Manual* that has been developed for the Georgia Department of Natural Resources by the Center for Watershed Protection, the Chatham County - Savannah Metropolitan Planning Commission, and Georgia's coastal local governments. The Coastal Stormwater Supplement should be used in conjunction with this utility handbook for local stormwater program development and for specialized information on coastal stormwater management controls.

SECTION I: Introduction and Background

The proper management of stormwater runoff and the mitigation of stormwater impacts in urban and urbanizing areas are challenging issues facing many local governments across the state of Georgia. The changes in stormwater quantity and quality caused by land development can have a number of negative impacts on Georgia's aquatic resources. The construction of impervious surfaces that do not allow infiltration of rainfall, such as roads, parking lots, and rooftops, results in increased stormwater discharge rates, volumes, and pollutant loadings. The increase in impervious surface area can also cause more frequent and extreme incidents of flash-flooding, sanitary sewer overflows, erosion and sedimentation, and water quality impairment (Figure 1) (Paul and Meyer, 2001). Successfully mitigating these impacts through the development of comprehensive stormwater management programs is critical to maintaining the health of the aquatic resources that greatly contribute to the state's natural beauty, economic well-being, and quality of life. In many jurisdictions, comprehensive local stormwater management programs must be developed to meet the requirements of Phase I and II of the National Pollutant Discharge Elimination System (NPDES) stormwater program.

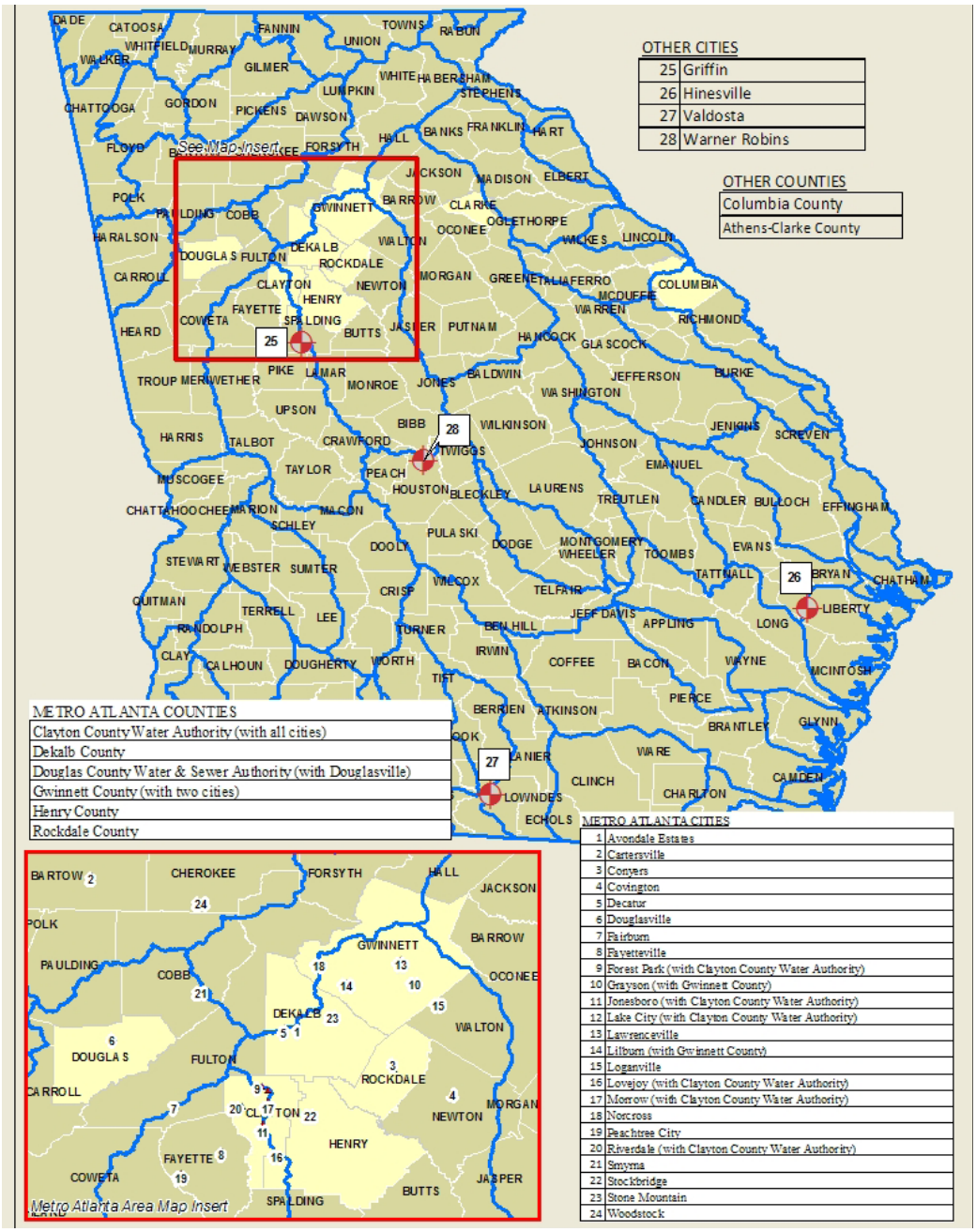
Although an important and, in many cases necessary, endeavor, the development of a stormwater management program is also an increasingly expensive undertaking for local governments. The implementation of local stormwater management standards and design criteria, a local stormwater management ordinance, a stormwater guidance manual, a plan review process, an inspection and maintenance program, and other elements of an effective program places an increased financial burden and responsibility on local governments. Often, local governments have a difficult time with the development, implementation, and funding of these various program elements.

Figure 1. Degraded Stream and Stormwater Conveyance System

Courtesy Center for Watershed Protection.

In an effort to more reliably and effectively fund the elements of a comprehensive stormwater management program, many local governments have implemented, or are considering implementing, a stormwater utility. Broadly defined, a stormwater utility is an organizational and financial entity that establishes a formal plan of action and implementation strategy to secure the funding necessary to operate a local government's stormwater program. If implemented correctly, a stormwater utility and the dedicated revenue stream it provides can help a community enhance its program and more effectively address local stormwater management needs.

Figure 2. Locations with Stormwater Utilities in Georgia



In the southeastern United States, nearly 200 stormwater utilities have been established, with over half of these occurring in Florida (SESWA, 2007). The first Georgia utility was established in Griffin, Georgia in 1998, and there are currently at least 25 stormwater utilities in Georgia (Figure 2), most of which are located in the Atlanta metropolitan area. According to *Stormwater Magazine*, by the year 2020 there may be as many as 10,000 stormwater utilities nationwide—one for each town and urbanized county with more than 10,000 people (Reese, 2007). The stormwater user fees collected by a stormwater utility, like the water and wastewater fees collected by other utilities, may be the best long-term solution for helping fund comprehensive local stormwater management programs (Reese, 2007). Increasingly, local jurisdictions in Georgia are recognizing how valuable the stormwater utility concept is in managing, implementing, and funding a local stormwater program, which ultimately helps protect valuable aquatic resources from the negative impacts of land development.

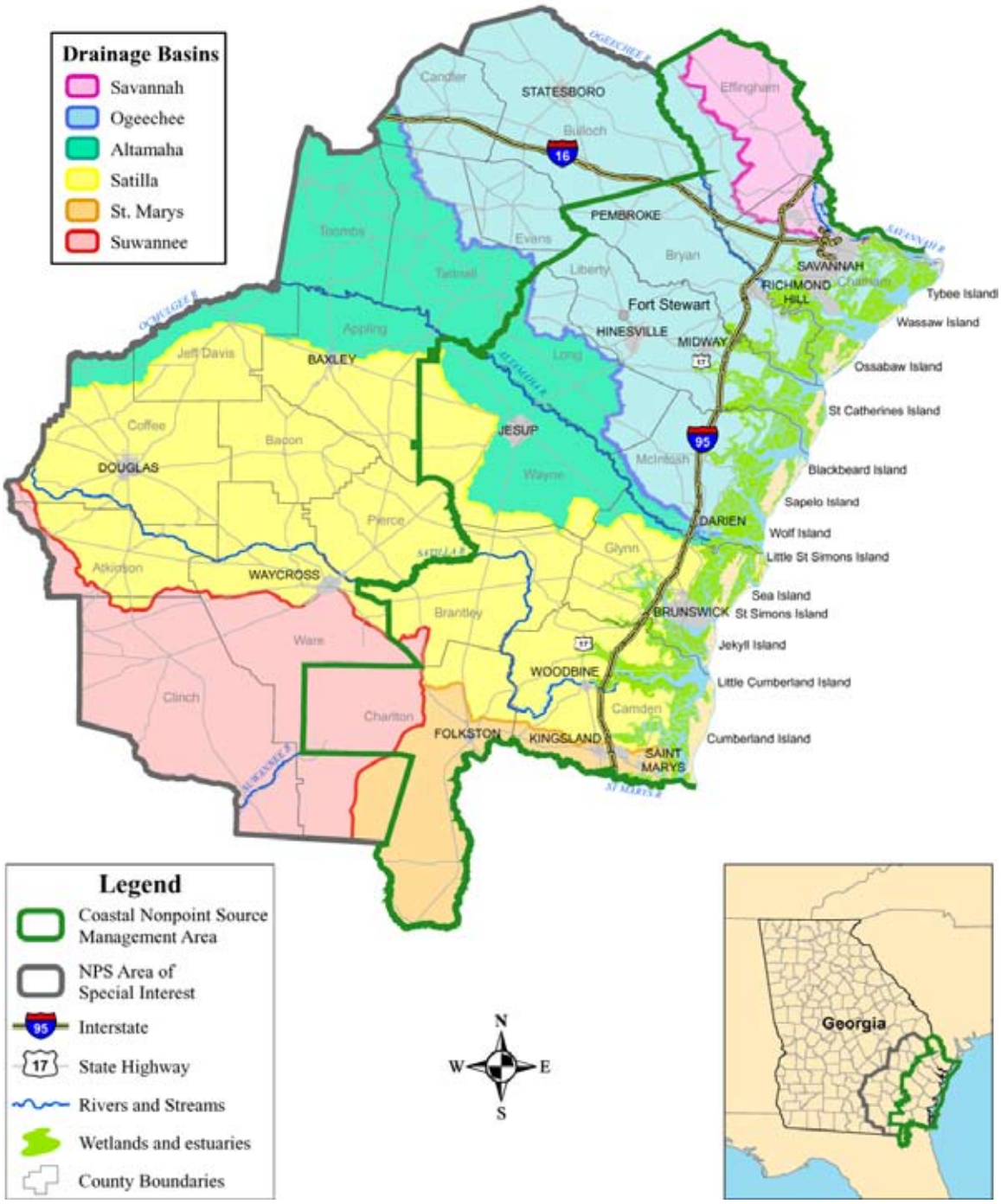
Georgia's Coastal Communities

Georgia has recently finalized two planning initiatives that support development of stormwater utilities on the coast. First, Georgia's Draft Coastal Comprehensive Plan recommends that local governments "develop stormwater utility programs across the region" to meet specific watershed management goals outlined in the Coastal Comprehensive Plan (DCA, 2007). In addition, the Coastal Comprehensive Plan outlines performance standards for local governments to achieve an "excellence standard," and one of the standards includes implementing a stormwater utility. A second initiative is found in the Georgia Comprehensive State-wide Water Management Plan, which recommends that local governments set up and implement stormwater utilities to address nonpoint source pollution (GWC, 2008). The final State-wide Water Management Plan states that stormwater utilities should be used as a mechanism for funding the administration, operations and maintenance, and capital construction costs associated with local stormwater management programs and nonpoint source pollution controls.

The six counties in Georgia that can be found immediately along the coast are Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden. The largest metropolitan area within this first tier of Atlantic coastal counties is Savannah, located in Chatham County. Together with an additional five inland counties (Effingham, Long, Wayne, Brantley, and Charlton), they comprise the 11-county federally and state approved "Coastal Zone" as well as the Department of Natural Resources' Coastal Nonpoint Source Management Area (Figure 3). For the purposes of nonpoint source pollution control, an additional 13 counties, located immediately to the west of these first and second tier coastal counties, have been designated as an Area of Special Interest for the Georgia Department of Natural Resources' Coastal Nonpoint Program.

By 2030, the populations of Georgia's greater coastal area are expected to reach over 800,000 people, an increase of greater than 50% over the year 2000 population (CQG, 2006). Most areas within this region have seen significant growth during the last few decades. This growth can have severe impacts on the surrounding natural resources, as urbanization has previously been linked to impervious surface cover increases, loss of tree canopy, and exposure of critical wetlands to direct destruction (Table 1).

Figure 3. The Coastal Nonpoint Source Management Area



Courtesy CRD.

Table 1. Percent Change in Land Cover from 1991-2005 for Georgia's First Tier of Atlantic Counties

Land Cover Change (%)

County	Impervious Surface	Tree Canopy
Bryan	81.05	-4.02
Camden	70.4	-4.88
Chatham	70.31	-14.92
Glynn	65.46	-7.11
Liberty	67.66	-6.35
McIntosh	31.16	-0.38

Coastal ecosystems and resources are particularly susceptible to the impacts of urbanization, as the changes in stormwater quantity and quality caused by land development can damage, alter, and/or destroy salt and freshwater marshes, dunes, beaches, back barrier islands, tidal creeks, and estuaries that provide fragile but essential habitats for a myriad of different species (CWP 2008). Of particular interest is the vast expanse of coastal marshlands found along Georgia's Atlantic shore. Although the Georgia coastline is just 100 miles in length, it supports one-third of the remaining vegetated salt marsh along the Atlantic seaboard (http://www.sapelonerr.org/estuaries.htm). In addition to being a recreational attraction and tourist destination, the highly productive and biologically diverse marshlands provide essential habitat for commercial and recreational finfish, shellfish and crustaceans, such as blue crabs and the world-famous "Wild Georgia" shrimp. Nursery areas have been identified in the marshlands for shark, sturgeon, whales, dolphins, marine turtles, and other animals of concern. The marshlands also support many migratory water and shorebirds, raptors, and neo-tropical songbirds in addition to resident birds that all depend on clean water and intact habitats. Besides providing valuable wildlife habitat, the coastal marshlands help mitigate flood damage, provide water quality benefits, and slow shoreline erosion. The associated barrier islands not only help protect the coastal marshlands, but also estuaries and the mainland from storm surges and flooding associated with hurricanes and other storms.

Figure 4. Barbour Pointe, Savannah, Georgia

Courtesy Gregg Bayard.

SECTION II: Stormwater Management Program Assessment and Funding Analysis

Before a stormwater utility can be considered, it is important for a local government to have a well thought out and designed stormwater management program. Since this handbook is concerned primarily with the development of stormwater utilities as the principal funding mechanism for a local stormwater management program, the development of a comprehensive stormwater management program will not be expansively discussed here. Additional information about the development of a local stormwater program can be found in the Coastal Stormwater Supplement to the Georgia Stormwater Management Manual (CWP, 2008). The importance of setting up a local stormwater management program prior to development of a stormwater utility cannot be overstated. Simply put, a the implementation of a stormwater utility should not be undertaken without a well-defined program.

Assuming that the community has a stormwater management program in place, the first step in developing a stormwater utility is to assess the program to determine the level of service and the corresponding level of funding that is needed to support it. The key activities include the following:

- Conduct inventory and assessment of the existing program.
- Evaluate future program level of service and cost of the program.
- Evaluate future program funding options.
- Identify potential program funding sources.

Conduct an Inventory and Assessment of the Existing Stormwater Program

The local government should consider hiring a qualified professional to assist with the assessment of its stormwater management program to ensure that all program elements are adequately investigated. The steps involved with this assessment include the local government conducting a thorough review of its existing stormwater management program to define what program elements it currently has, what program elements are missing or desired, and what the costs associated with both its current and future stormwater programs will be. Any missing or desired program elements can be implemented in conjunction with development of the stormwater utility.

Review of pertinent local information and interviews with local staff are a key task in completing the assessment and determining the costs associated with the current and future stormwater management programs. Existing stormwater management program budget line items may be broken out into the following broad categories:

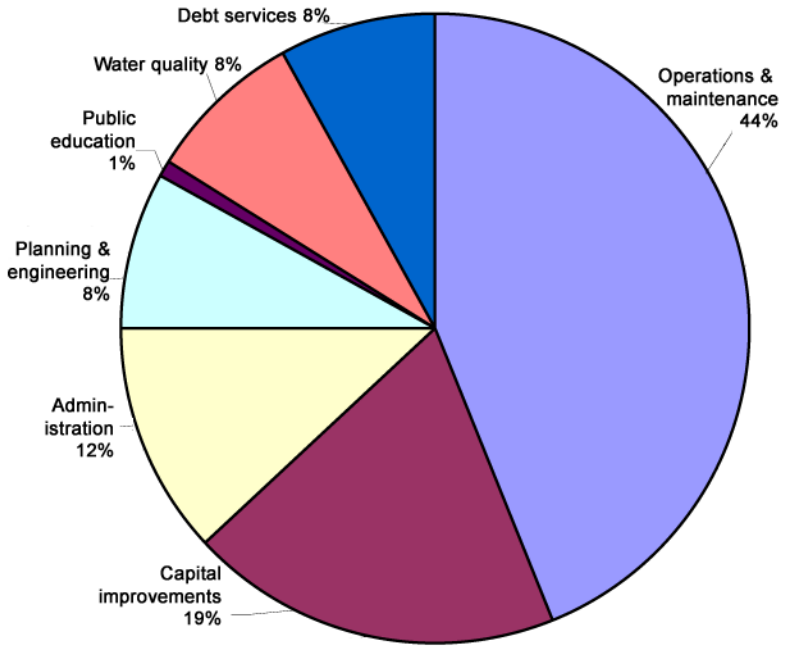
- Program Administration/Coordination
- Engineering and Planning
- Regulatory Compliance
- Operations and Maintenance
- Capital Improvement Projects

The actual budgets associated with these various elements will vary widely from community to community, depending on community characteristics, issues, needs, and

priorities, but, in general, the Operations and Maintenance and Capital Improvement elements will constitute a majority of both the existing and future stormwater management program budget. See Figure 5 for an illustration of the budget associated with each of the program elements in a typical local stormwater management program.

Current stormwater program funding sources such as General Fund taxes, Special Purpose Local Option Sales Tax (SPLOST), Local Option Sales Tax (LOST), special service fees, and other funding sources should be researched and identified as well. This research will assist the local government in establishing the existing funding level and identifying the "funding gap" that will likely materialize for the future stormwater program.

Figure 5. Typical Stormwater Management Program Budget Breakdown



Evaluate Future Stormwater Program Level of Service and Associated Cost

Once the existing needs and issues are understood, the future stormwater program needs and priorities can be established and better defined. Communities should consider at least a five-year planning horizon for their stormwater program to ensure that variability in yearly operations, maintenance, and capital improvement needs are accounted for. Jurisdictions should anticipate future regulatory requirements, perform inventories and condition assessments of their stormwater drainage systems, and establish a prioritized ranking system for Capital Improvement Projects. Using the future level of service as the basis, the cost of the future program can be estimated and developed according to the general categories found in Table 2. Since the CSS (CWP, 2008) provides additional details and guidance on how to design and implement a comprehensive stormwater management program, significant cost savings may be realized if this resource is used during this future forecasting activity.

Table 2. Example Future Stormwater Management Program Cost Implications by Element

Stormwater Management Program Element	Cost Implication	
	If using information in the CSS	**If not using information in the CSS**
Stormwater Management Approach, Standards and Design Criteria	Low	Medium
Post-Construction Stormwater Management Ordinance (Local Regulation) • Natural Resource Protection • Runoff Reduction • Water Quality • Flood Control	Low	Medium
Stormwater Guidance Manual (to support ordinance)	Low	Medium to High
Site Plan Review and Approval Process • Permit Applications, Instructions and Checklists • Application Tracking System	Medium	Medium
Construction Inspection Program • Inspection Checklists	Medium	Medium
Program Tracking and Evaluation • Regulatory Compliance with NPDES Stormwater Permits • Public Education & Involvement • Water Quality Monitoring	Medium	Medium
Inspection and Maintenance Program • Comprehensive MS4 Inventory • System Condition Assessment • Routine Storm Drain System Maintenance and Repair • Capital Maintenance/Replacement	High	High

Stormwater Program Funding Options and Sources

In many communities, a combination of funding sources is currently being used to fund existing stormwater management efforts. Since a program's level of service will need to be expanded and enhanced over time (e.g., in response to future urbanization and land development, etc.), it is likely that additional funding will need to be obtained. The future revenue stream needs to be stable and consistent to ensure that all of the needed and desired elements of the future stormwater management program can be implemented. Primary funding mechanisms are often adequate to fund all operational areas of a typical stormwater program. Secondary funding mechanisms are typically used for specialized projects/activities as well as to augment the primary funding source(s). Examples of primary and secondary funding options include:

Primary Funding Methods:

- Stormwater user fees (stormwater utility)
- General fund taxes and appropriations

Secondary Funding Methods:

- Site plan review fees
- Special assessments
- Special service fees
- Revenue bonds or loans for capital improvements
- In-lieu of construction fees
- System development charges
- Impact fees
- Developer extension/latecomer fees
- Special Purpose Local Option Sales Tax (SPLOST)
- Federal and state grant funding

Rarely does stormwater utility user fee revenue (or general fund revenue, for that matter) provide 100% of the funding needed to support all of the elements of a local stormwater management program. If stormwater user fee charges were used exclusively to fund the entire program, customer billing rates/user fee charges would likely exceed the customer's "willingness to pay" threshold. As such, a local government should attempt to supplement the primary funding mechanism (i.e. stormwater utility fees) with a combination of secondary funding mechanisms (i.e. special service fees, SPLOST, grants, etc.). This concept of "blended funding" will enable the local government to meet local stormwater management needs, goals and objectives in the most cost effective manner.

Establishment of a stormwater utility typically involves the formation of an enterprise fund so that the funds generated by the stormwater utility feed directly into a dedicated account for exclusive use by the local stormwater management program for expenses and revenues on an ongoing basis.

Many local governments have opted to perform a stormwater program funding feasibility study to evaluate the issues outlined above prior to making a final decision on moving forward with stormwater utility set up and implementation. The feasibility study allows for a local government to obtain valuable insight into the various program service and funding issues without the full commitment to set up the utility. A feasibility study will:

1. Identify future stormwater program needs, priorities, and estimated costs.
2. Investigate the applicability of various funding methods.
3. Evaluate challenges and legal implications.
4. Develop recommendations and determine funding sources and an implementation schedule.

In some cases, communities have chosen to form a Stakeholder Advisory Committee to obtain input and feedback from their "future customers" regarding the concept. The technical and financial data, combined with the public involvement/stakeholder process, typically provide elected officials with the necessary information to make an informed decision about setting up a stormwater utility in their community. One coastal community that elected to perform a Feasibility Study was Garden City, Georgia. A summary of the project is presented as Case Study #1.

Case Study #1: Garden City Stormwater Program Funding Feasibility Study

In 2007, Garden City, located in the northern reach of Georgia's coastal zone, evaluated the feasibility of expanding its local stormwater management program to address regulatory compliance issues related to the NPDES Phase I Municipal Separate Storm Sewer System (MS4) Permit. The City also needed to develop a more proactive Operations and Maintenance (O&M) program to address the aging and expanding stormwater drainage system throughout the City. Additionally, the City needed to undertake the necessary actions to address capital drainage improvement projects.

Garden City has unique land use characteristics that also had an influence on the City's consideration of expansion of its stormwater program. Garden City has an extensive number of warehouse and transportation facilities that support the Garden City Terminal of the Georgia Ports Authority. These warehouse and transportation facilities have large impervious surface areas that generate a significant amount of runoff. After rainfall events, the City's topography makes it susceptible to flooding due to the inefficient runoff conveyance capacity of the drainage system combined with the large increases in runoff from these facilities.

The City performed a Stormwater Program Funding Feasibility Study to:

1) Identify future stormwater program needs, priorities, and estimated costs.
2) Investigate the applicability of various funding methods to Garden City.
3) Evaluate the implementation challenges and legal implications of the various funding methods.
4) Develop recommendations related to the future stormwater program, the most viable program funding method and an implementation schedule.

Historically, Garden City's stormwater program has used a blended funding option as shown for fiscal year (FY) 2007 below:

- Local Option Sales Tax (LOST) - $375,063
- Chatham County Special Purpose Local Option Sales Tax (SPLOST) - $225,063
- Other funding (fees, taxes, water & sewer funds) - $150,000

These sources generated approximately $750,126 in revenue in FY 2007.

Future stormwater program cost of service (COS) projections were estimated to be approximately $1.2 million per year. It was recommended that revenue for the future, enhanced program be generated from one primary source (the stormwater utility) and two secondary sources (SPLOST and special service fees). The City will also pursue grant money and possibly amortized funding for capital construction (i.e. revenue bonds or low interest loans) as the future program needs dictate. The City's initial program funding plan is as follows:

- Stormwater utility revenue - $1,059,344
- SPLOST - $150,000
- Special service fees - $5,000

The future, enhanced stormwater program will include the allocation of additional Public Works resources to address drainage system O&M issues, development of a City-wide Drainage Masterplan, identification of priority capital improvement projects and compliance with applicable regulatory requirements, such as the City's NPDES Phase I MS4 Permit as well as the stormwater management elements of their wastewater treatment plant permit.

Based on the findings and recommendations in the final report, the City has elected to move forward with the set up and implementation of a stormwater utility in 2008 with the first billing scheduled for 2009.

SECTION III: Six Steps to Setting Up a Stormwater Utility

Once a local government has decided they want to set up a stormwater utility to assist with the funding and implementation of their stormwater program, a number of steps need to be taken to ensure that the utility is created properly. This section presents a six-step process that provides a general overview of the approach that should be undertaken to establish a legally defensible stormwater utility.

> *NOTE: The setup and implementation of a stormwater utility is a very complex process that is highly dependent on community-specific stormwater needs, issues, priorities, costs, etc. The following multi-step process is meant to be a general guide, and it may or may not be appropriate for your local government. Local governments are encouraged to consult with qualified technical and legal professionals who are experienced with, and knowledgeable about, the stormwater utility setup and implementation process.*

The steps are listed below and described in more detail in the ensuing paragraphs of the section.

1. Develop education and outreach program.
2. Establish and define administrative/organizational structure.
3. Obtain parcel, land use and customer account data.
4. Develop rate structure and perform rate study analyses.
5. Establish billing and database management systems.
6. Adopt stormwater utility ordinance and implement stormwater utility.

The six-step process has been developed from extensive review of many stormwater utility examples around Georgia. It provides a practical approach that can be used by local governments to better understand the stormwater utility setup and implementation process. Most importantly, this process should help illustrate program development complexities so that local governments can avoid common pitfalls associated with stormwater utility setup and implementation.

Step 1: Develop Education and Outreach Program

Education is crucial for a successful utility to gain widespread acceptance. In the past, surveys have shown that local residents don't know that stormwater runoff is a significant source of water pollution and that stormwater often receives no treatment before reaching a stream or river (NEETF, 1997; Bartlett, 2006). Lack of public awareness about the impacts of stormwater runoff can be a major obstacle to public acceptance of a stormwater utility. To help citizens better understand the need for a utility and dedicated source of stormwater program funding, public education programs must be used effectively. Elected officials also need to understand why stormwater management is an important issue for the local government and how the stormwater utility will assist the community in achieving local stormwater management needs, goals and objectives in the most effective manner.

The education program's main objective should be to inform customers of what the local stormwater management needs and priorities are and why the implementation of a stormwater utility will enable the community to address these issues in a more comprehensive manner. As such, educating the public about the connection between a stormwater utility, user fees and how the utility will provide environmental and social benefits can aid in the utility's acceptance and reduce legal challenges (PVPC, 2007). In order to derive the most value from public education, the program should be implemented as early as possible during the program assessment and stormwater utility establishment process. These efforts should be continued once the stormwater utility is operating, since outreach and education can help foster the acceptance of fee structures and rates, which in turn reduces the potential for legal action. New or existing local staff can initiate this effort, with the ongoing stormwater outreach staff positions supported by funding from utility revenue.

Depending on the community, the educational campaign can be directed toward the general public and/or toward particular groups within the community (e.g. homeowner associations, environmental groups, etc). Since customer bills differ depending on their customer class and parcel runoff characteristics, the customers paying higher fees may need to have a different, more targeted education program and message. Conversely, residential customers typically have much smaller bills than many non-residential customers, so their education program may be different.

If a stormwater utility is in its initial establishment phase, informative educational components, which justify and explain how the utility operates and why user fees must be charged for the service rendered, should be used by the local government. This material may include sample bills, pamphlets with details on the local stormwater management program and local stormwater management efforts (e.g., what the money will be used for), information related to the stormwater utility and user fee concept, and general brochures on pollution prevention and water quality.

Once a stormwater utility becomes fully operational, continued public education can guarantee long-term acceptance and support for the utility. Each community is different, however, and educational tools should be tailored to meet local needs. In order to determine these needs, the following questions need to be addressed:

- How much knowledge does the community have on stormwater issues?
- What do the users need to know?
- What is the message that we want to convey?
- What do we want the users to know?
- What are the direct and indirect benefits realized from proper stormwater management?

The city of Perry developed an educational campaign that successfully incorporated many of the program elements discussed above. A summary of their materials and methods are included in Case Study #2.

Case Study #2: City of Perry's Public Education Program

The objective of the City of Perry's public education plan is to promote, publicize, and educate stakeholders on the need for an enhanced local stormwater management program and the implementation of a stormwater utility and user fee system to assist this effort.

The City developed the following guiding principles for its educational campaign:

1) The City's stormwater management issues are real and unresolved.
2) Implementation of the City's future stormwater program will effectively address these issues and benefits will result.
3) Government must lead and develop a strategy to address all the pertinent issues related to stormwater management.

The City also identified Key Messages to be emphasized to their constituency:

1) Aging infrastructure
2) Clean water
3) Customer service
4) Balance of cost
5) Regulatory compliance and safety
6) Quality of life

Three educational steps / time periods were discussed: 1) the build-up to billing period, 2) the initial billing period, and 3) the post-billing period

Build-up

Goal: To educate and build support among various stakeholder groups.

Messages: Stress the current stormwater management issues experienced by the community, that all properties generate runoff, and the benefits of an enhanced program; introduce the concept of fairness and equity in paying for the program through a stormwater utility.

Billing Day

Goal: To educate ratepayers on the new bill that they have received.

Messages: Once the bill is received, there will be questions. There must be a phone number that customers can call to get answers to these questions. Non-technical personnel should be educated to answer basic questions on the rate structure and credits developed from the program. Advanced questions, including drainage complaints and service requests, should be answered by technical personnel. Another goal of this phase is to ward off any criticism of the program. It is important to show that the program is taking a more proactive approach in addressing local stormwater management issues.

Post-billing Period

Goal: To initiate longer-term public education and response programs.

Messages: The focus of the program will shift from the customer's bill to responding to customer service requests and complaints. It is also important in this phase to keep "getting the word out." Strategies must be developed to accomplish the City's long-term goals.

Tools for Communication

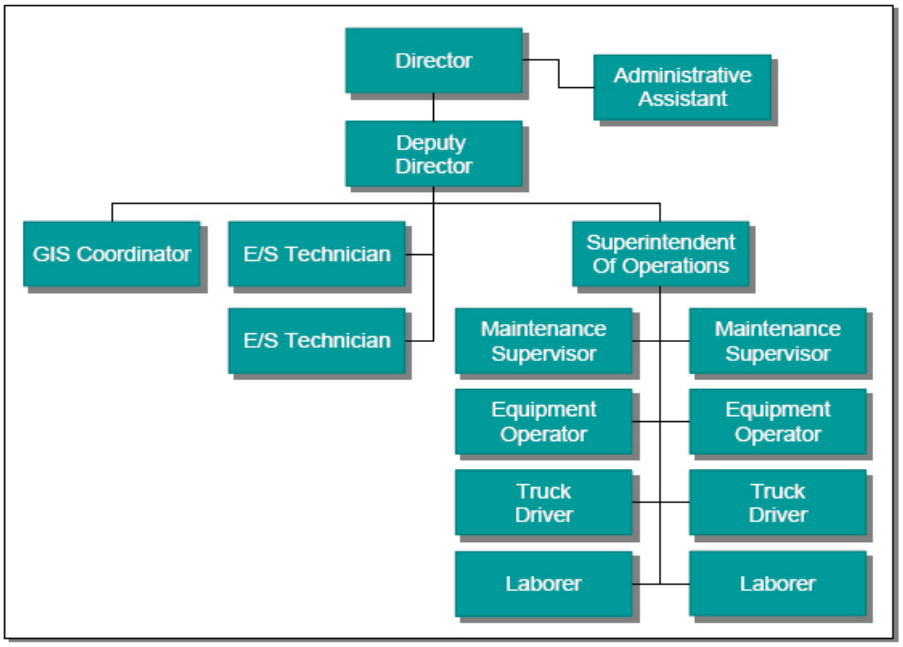
Fact sheets, Frequently Asked Questions (FAQs), bill stuffers, a Web site, public meetings, large customer notification, and City staff training are all planned for use with the education program.

Step 2: Establish and Define Administrative/Organizational Structure

One of the key policy decisions that a local government must address when contemplating the setup and implementation of a stormwater utility is the administrative and organizational structure of the new entity. Proper planning and design of these structures will aid in its success, while poor organization can lead to major difficulties in executing everyday tasks and activities. Therefore, it is important to clearly define roles and responsibilities for the stormwater utility to ensure operational success.

In Georgia, most stormwater utilities have been designed to operate under another existing department within the local government (Figure 6). The most significant advantage to operating a stormwater utility under another department is that resources such as equipment, labor and institutional infrastructure are readily available. In many cases, the stormwater utility is combined with the Public Works Department, and a new enterprise fund is set up for the stormwater utility. Many local governments in Georgia have been very successful with this approach. The City of Griffin's stormwater utility was initially set up under its existing Public Works Department, and a new enterprise fund was established for stormwater management within that department. A variation of this approach is to establish a separate accounting cost center under an existing enterprise fund. In 2004, the City of Fayetteville set up its stormwater utility under its existing Public Services Department, which included the water and sewer enterprise fund. The City of Fayetteville then established a separate cost center under this fund to specifically track revenues and expenditures related to stormwater management.

Figure 6. City of Griffin Stormwater Department Organizational Chart



Large communities with significant program needs may want to consider development of a stand-alone Stormwater Utility Department that is entirely responsible for stormwater management services. The advantage to this approach is that one department is dedicated exclusively to stormwater management issues and service delivery. One of the main disadvantages, however, is that the up-front start-up costs can be high, as all the departmental components such as office spaces, equipment, and personnel are being created from scratch. Large governments may want to set up the stormwater utility under another established department initially and then evolve the utility into a stand-alone entity in the future. The existing stormwater management program Assessment and Funding Analysis (Section II) is an excellent way to review existing departmental operations so that a utility's organizational and operations plan can be developed with a direct link to the desired future level and cost of service.

Step 3: Obtain Parcel, Land Use, and Customer Account Data

This step involves obtaining the necessary parcel-specific information including the parcel identification numbers, land use, zoning, tax assessor's data, and geographic information system (GIS) database materials. The information gathered from this step will be used to create the needed data fields that will eventually become the stormwater utility master account file (see Step 5 for more information).

The key elements of a parcel database that are needed to develop the future master account file include: (1) parcel identification number, (2) land use data, (3) impervious surface area, and (4) parcel address information. The use of a GIS will make this exercise much easier because these elements can be easily linked together as each parcel account is developed for billing. Once the initial database is developed by the professionals setting up the utility, local staff members will need to develop a schedule for routine monitoring and updating of the database as land cover and land use change on the parcels so that billing can be adjusted as necessary.

Step 4: Develop Rate Structure and Perform Rate Study Analyses

The key step during the development of a stormwater utility lies in the selection of the rate methodology and development of the rate structure. The rate methodology and rate structure determine how user fees are calculated and assigned to parcels within the jurisdiction. Unlike water and electrical utilities that are able to track user consumption with meters, stormwater utilities typically can only make an estimate of the amount of runoff that each parcel of land generates due to the impracticality of direct measurement of stormwater runoff from each parcel. This can create a conflict between customer equity and rate structure efficiency.

Most fee structures follow the "you pave, you pay" principle, meaning that since runoff characteristics (e.g. volume, rate, velocity, and pollutant load) are related to a parcel's impervious surface area, parcels with greater amounts of impervious surface are typically charged a higher user fee. This is also commonly known as the impervious area rate methodology. A more efficient, but slightly less equitable option is to apply a similar user fee charge to all members of a particular zoning class or land use type, under the land use rate methodology. A hybrid approach may combine both the impervious and pervious

acreage on a site to develop the runoff relationship for the parcel. Most jurisdictions in Georgia have utilized the impervious area rate methodology as a basis for their rate structure and user fee charges. This rate methodology has been upheld by the Georgia Supreme Court's ruling in 2004 for the Columbia County Stormwater Utility, which may explain why many stormwater utilities in Georgia have utilized the impervious area rate method.

A key component of the impervious area rate methodology is establishing the median amount of impervious area found on a typical single family residential parcel in the jurisdiction. This is typically done through a spatial analysis using GIS data such as aerial photography. Residential parcels in the jurisdiction are analyzed for the amount of impervious surface they contain including rooftops, driveways, sidewalks, and similar surfaces. From this, the median amount of impervious surface on a typical residential parcel is selected as representative of all "average-sized" residential parcels. This is commonly referred to as an Equivalent Runoff Unit or Equivalent Residential Unit (ERU). The ERU serves as the billing unit for the stormwater utility in the same way the kilowatt-hour is used as a billing unit on an electric bill or the cost per 1,000 gallons is the billing unit for a water bill. The ERU for the existing stormwater utilities in Georgia typically ranges from 2,000 ft^2 to 5,000 ft^2 of impervious surface.

Once the rate structure is determined, a rate study must be performed. The primary purpose of the rate study is to establish the billing rate for the stormwater utility based on the projected stormwater management program's cost of service for the parcels/ customers within the jurisdiction. The rate study exercise is often an iterative process where the program cost of service and the corresponding billing rates will be balanced with each other until both an adequate funding level and acceptable user fee rate(s) are established.

By combining the rate structure with the rate study, a billing rate per ERU is established. In Georgia, the billing rate per ERU typically ranges between $3.00 - $6.00 per ERU per month. If jurisdictions apply this ERU rate uniformly across single family residential classes, this is called a flat rate structure. For example, DeKalb County's stormwater utility uses this single flat rate approach for the single family residential customers (for more on DeKalb County see Case Study #3). More complex billing structures exist as well. When there is a large discrepancy between the amount of impervious area on the residential parcels within a jurisdiction, a tiered flat rate structure has been utilized. Residential parcels with large amounts of impervious area are charged more than those with smaller amounts of impervious area to ensure equity among the various residential customer classes. Griffin and Peachtree City use multi-tiered, flat rate systems for residential parcels because of the significant variance in residential parcel impervious cover. Columbia County and Gwinnett County utilize a rate structure approach whereby every residential parcel receives a parcel-specific bill calculated on a "per 100 square foot of impervious area basis." Each local government will have to analyze the level of detail in their existing parcel and GIS databases to determine if a single tier, multi-tiered or parcel-specific residential billing system is the most fair and equitable.

For non-residential customers, a custom bill is typically calculated for each parcel based on the actual impervious surface area on the parcel. For example, if a non-residential parcel has 12,000 ft^2 of impervious area and the ERU is 3,000 ft^2 with a billing rate of

$4.00 per ERU per month, then the monthly stormwater utility user fee bill calculation would be as follows:

Impervious area ÷ ERU x monthly rate per ERU = monthly fee
12,000 ÷ 3,000 x $4.00 = $16.00 per month

Additional modifiers to the rate structure outlined above can be implemented by the local government to enhance equity among customer classes. If a jurisdiction is concerned about significant water quality impacts from certain types of land uses, a water quality factor surcharge could be incorporated into the rate structure. Commercial and industrial parcels typically contribute more pollutants per unit area than office/ institutional parcels. Therefore, it might be appropriate to factor water quality impacts associated with the different land uses into the rate structure to enhance equity. Additionally, if a stormwater utility elects to provide maintenance services for private, residential detention ponds, the rate structure might include a surcharge for those parcels/customers receiving that service.

A credit system also can play an important role in enhancing the rate structure equity by reducing stormwater fees for a parcel/customer that undertakes onsite mitigation of stormwater impacts. Structural controls such as bioretention areas, dry wells, or rainwater harvesting systems as discussed in the *Georgia Stormwater Management Manual* and the Coastal Supplement can be used to mitigate the stormwater runoff contribution of a parcel. With proper documentation, a jurisdiction may wish to credit these runoff quantity and quality reductions from the parcel with a reduction in the stormwater user fee. Education credits are typically offered as well since government entities such as public schools can alleviate some of the cost and responsibility for water resources education that the local government would otherwise have to address. The Griffin stormwater utility, for example, provides a significant credit for the local school system for teaching the Water Wise Curriculum in the middle schools, which offsets the implementation cost of the City's Public Education program associated with its NPDES Phase II Stormwater Permit.

Case Study #3: DeKalb County Utility Data Collection

DeKalb County uses three different data sources for their stormwater utility fee calculations. These data sources are:

1) Tax Assessor Master Account Database
2) Parcel boundaries
3) Impervious ground cover

A digital GIS layer of impervious ground cover from DeKalb County's planimetric maps based on aerial photography was used to calculate impervious surface area for each parcel.

1,400 digital property files containing parcel boundary information were georeferenced to the base map.

More detailed technical information on DeKalb County's stormwater utiliy fee calculations can be found in Lawlor et al, 2005.

Figure CS-4. Sample Digitized Parcel Showing Rooftop and Paved Impervious Surface Footprints.

Courtesy City of Durham, NC

Step 5: Establish Billing and Database Management Systems

Billing and database management systems are critical elements of the stormwater utility setup and implementation process. The stormwater utility master account file is the tool utilized to generate the customer bills and set the bills up for delivery. This file typically contains data related to parcel identification number, land use categorization, parcel size, impervious area coverage, billing address, credits, etc. Other data fields can be added to ensure that all the pertinent information for the customer's account is known and documented. Since a master account file is a dynamic database that must be constantly managed and updated, the update process will likely include multiple local government departments and staff with different roles and responsibilities. As such, it is important for the stormwater utility to have developed standard operating procedures for its master account file to ensure that updates are accomplished in a comprehensive and timely manner.

Once the master account file is developed, the desired method for delivery of the customer bill must be determined. Stormwater utility bills are typically delivered using one of the following methods: 1) monthly public utility bill; 2) annual property tax bill; or 3) stand alone bill. The most common method currently used within the state of Georgia is the monthly public utility bill (e.g. Griffin, Hinesville, Fayetteville, and Warner Robins) but the annual property tax bill is becoming more common, especially with county stormwater utilities (e.g. Henry County, Gwinnett County, DeKalb County and Woodstock). Some communities have successfully used a stand-alone billing system for the stormwater utility, including Peachtree City, City of Covington, and Rockdale County.

Step 6: Adopt Stormwater Utility Ordinance and Implement Stormwater Utility

A stormwater utility is established through an ordinance, which is defined as a statute or regulation enacted by a local government. An outline of a stormwater utility model ordinance is included in Case Study #4. In the case of a stormwater utility ordinance, a local government adopts the ordinance to codify key provisions (e.g. rate structure, billing rate, accounting procedures, responsibilities, exemptions, credits, enforcement, billing/collections, appeals, etc). Details and clarity in the stormwater utility ordinance can help greatly in cases where a utility must defend its actions against legal challenges. While legal challenges have occurred in Georgia, the Georgia Supreme Court upheld Columbia County's stormwater utility setup and implementation methodology in 2004, thus establishing a firm legal footing for future utilities in other jurisdictions across the State.

The stormwater utility will operate similarly to other public utilities run by the local government, such as water, sewer, sanitation, electricity, natural gas, etc. Therefore, the stormwater utility should develop and implement a customer service program to address customer inquiries regarding the stormwater user fee charge and/or the local stormwater management program. A comprehensive and detailed customer service program will ensure that customer inquiries are properly handled and tracked as they arise. Furthermore, the proper management of initial customer inquiries will limit the

potential that the issues will be elevated up the organizational structure of the local government, which could result in the issues becoming less customer service oriented and more political. Emphasizing the importance of customer service to local staff and developing effective outreach and education materials for the public that answer many of the questions up front are the keys for public acceptance of the utility.

The other actions that must be undertaken to implement and maintain the stormwater utility include actual delivery of the customer bills; implementation of the customer service program to address customer inquiries; implementation of the expanded or enhanced stormwater program at the defined level of service; continuation of the public relations campaign; and the update and management of customer accounts to ensure accuracy.

Case Study #4: Peachtree City's Model Ordinance

Peachtree City developed and implemented a stormwater utility culminating with the passage of a stormwater utility ordinance in 2006. Sections of the ordinance include:

1) Definitions
2) Establishment of a stormwater utility and enterprise fund
3) Scope of responsibility for stormwater management systems and facilities
4) Stormwater utility customer classes
5) Stormwater user fee charges
6) Stormwater user fee charge rates
7) Stormwater user fee charge exemptions
8) Stormwater user fee charge credits
9) Enforcement methods and inspections
10) Stormwater user fee charge billing, delinquencies, collections, adjustments
11) Appeals and hearings

The complete ordinance can be found at

http://www.peachtree-city.org/documents/Engineering/Stormwater/swordinance.pdf

SECTION IV: Conclusions and Additional Resources

To create and implement an effective local stormwater management program, adequate funding is essential. While many sources exist for stormwater funding, the establishment of a stormwater utility is gaining traction in Georgia as the most fair, equitable, and stable method to fund a local stormwater program. While each jurisdiction should consider their community-specific stormwater management priorities and needs, the principles outlined in this guidebook highlight key components and considerations that should be taken into account during program development and stormwater utility implementation.

A comprehensive assessment of both the current and projected future stormwater management program is a vital step in determining whether a stormwater utility is feasible for a particular community. Once the stormwater utility option is selected, the six steps previously outlined in this document should be investigated in detail to determine how to structure a public education campaign, administration, rates, billing, and legal components of the utility. A majority of the success of a stormwater utility can be attributed to the extensive planning, research, and data collection efforts performed before the first bills are mailed to the customers. Ultimately, an effective stormwater management program helps to accomplish the following: 1) preserve and/or improve ecological conditions in local watersheds; 2) address drainage system operation and maintenance issues; 3) achieve compliance with applicable regulatory requirements; and 4) mitigate recurring flooding through capital improvement project construction. A stormwater utility is one of the most effective ways to provide funding for local stormwater management efforts that address these important issues and help local governments in coastal Georgia protect their valuable natural resources for future generations.

When a local jurisdiction is considering a stormwater utility, it is always a good idea to contact another similarly sized city or county that has already gone through the stormwater utility development process. Following is a list of contacts in areas that have established utilities or completed research on the process.

Contact Information for Stormwater Utilities in Georgia

Cities

Cartersville
Stormwater Program Manager
City of Cartersville Public Works Department
770.606.9680

Conyers
Inspector
City of Conyers Environmental Services Department
770.929.3044

Covington
Stormwater Utility Manager
Engineering Department
770.385.2022

Fairburn
Public Works Director
Public Works Department
770.683.2486

Fayetteville
City Engineer
Public Services Department
770.461.6029

Garden City
City Manager
912.966.7777

Griffin
Director of Stormwater Division
Public Works Department
770.229.6424

Hinesville
Utility Supervisor
912.876.3584

Peachtree City
City Engineer
Engineering Department
770.631.2538

Warner Robins
Director of Public Works
Public Works Department
478.929.1900

Valdosta
Stormwater Superintendent
Department of Utility Services
229.259.3592

Counties

Athens-Clarke
Engineering Manager
Department of Transportation and Public Works
706.613.3440

Columbia
Systems Operations Manager
Public Works Department
706.863.6928

DeKalb
Assistant Director of Public Works
Public Works Department
404.294.2991

Douglas County Water & Sewer Authority (Douglas / City of Douglasville)
Executive Director
770.949.7617

Gwinnett
Stormwater Management Director
Water Resources Department
678.376.7126

Henry
Director of Stormwater Management
Stormwater Department
770.288.7346

Rockdale
Director of Stormwater Division
Public Services and Engineering Department
770.785.6917

Additional Online Resources for Stormwater Utilities

Griffin, Georgia's stormwater utility homepage
www.griffinstorm.com/SW/StormwaterUtility.htm

Athens-Clarke County, Georgia's stormwater utility homepage
www.accstormwater.com

Two articles in *Stormwater Magazine* on the legal and regulatory issues of stormwater utilities in Georgia
www.forester.net/sw_0011_utility.html
www.forester.net/sw_0405_stormwater.html

Comprehensive guide to stormwater utilities around the country including articles, bibliography, and case studies
http://stormwaterfinance.urbancenter.iupui.edu

Florida's 2003 stormwater utility manual
www.florida-stormwater.org/manual.html

"Guidance for Municipal Stormwater Funding"
www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

Acronyms

CSS: Coastal Stormwater Supplement

COS: Cost of services

ERU: Equivalent runoff unit or equivalent residential unit

GIS: Geographic Information System

LOST: Local Option Sales Tax

NPDES: Nonpoint Discharge Elimination System

SPLOST: Special Purpose Local Option Sales Tax

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