



Watershed Community Needs Assessment and Funding Options



Fairfax County,
Virginia

FINAL DRAFT

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FAIRFAX COUNTY WATERSHED COMMUNITY NEEDS ASSESSMENT AND FUNDING OPTIONS

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FAIRFAX COUNTY WATERSHED COMMUNITY NEEDS ASSESSMENT AND FUNDING OPTIONS

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FAIRFAX COUNTY WATERSHED COMMUNITY NEEDS ASSESSMENT AND FUNDING OPTIONS REPORT

EXECUTIVE SUMMARY

The needs and expectations of Fairfax County's citizens with regard to stormwater management have changed dramatically since the mid part of the 20th century when suburban development first began to transform the County's landscape. Between 1930 and 2002, as the County grew from a population of about 25,000 to almost 1 million, stormwater management changed from the development of disconnected systems of pipes and ditches to serve the needs of individual communities to a complex infrastructure challenged to address not only routine runoff flows but public safety, public health, environmental protection and pollution prevention.

In 2003, as part of a larger County-led effort, the leadership of the Stormwater Business Area of the Department of Public Works and Environmental Services engaged in a strategic planning exercise as a way to help refocus stormwater management efforts in light of new paradigm shifts, increasing expectations of County citizens, and an increasingly complicated State and federal regulatory framework. The effort included interviews with outside stakeholder groups and a series of facilitated work sessions to identify major issues as well as strengths, opportunities, weaknesses, and threats. Two basic themes emerged from this process – (1) that levels of service for stormwater management should be based on a clear understanding of actual needs, and (2) that the selected level of service must be supported by an adequate and stable source of funding.

To address these issues, and to provide a decision making tool for the Board of Supervisors regarding levels of service and funding mechanisms, the Strategic Plan contained tactics to “develop a funding plan for programs to reflect changing service levels, increased infrastructure inventories, unfunded mandates, and emergency events” and to “develop and implement a funding feasibility study for alternative methods and funding sources.” The Watershed Community Needs Assessment and Funding Options Study, presented in the following pages, addresses the strategies to implement these tactics and represents the first step towards positioning the County to meet its strategic stormwater management goals.

STORMWATER PROGRAM ASSESSMENT

The first step in assessment of the current program was the review of the role of watershed planning in the County Stormwater Program. In conjunction with the recently completed Stream Protection Strategy report and the Strategic Plan prepared for the stormwater management group, the Watershed Plans will provide the critical technical foundation for future capital improvement work. Public participation in these studies provides an opportunity for the County to educate the public about the major stormwater issues in their neighborhoods, while receiving feedback about the types of projects and





initiatives they are willing to support. This combination of technical assessment and community involvement is the key to building a program that meets the central mission of the stormwater program “to develop and maintain a comprehensive watershed and infrastructure program that will protect public health and safety and will enhance the quality of life in Fairfax County.”

The second step in the assessment was the identification of the current types and levels of services provided in Fairfax County. By assigning services to one of eight key functional areas, activities and costs were organized so that the overall levels of service could be determined and evaluated against other similar stormwater programs in the benchmarking process (see Appendix I for the full report on Benchmarking). A cost evaluation of current services found that Fairfax County spends approximately \$11.7 million on stormwater related activities, distributed as shown in the following table.

Administration	\$ 1,072,260
Special Programs	\$ 179,036
Billing and Finance	\$ 131,427
Watershed Management - Planning	\$ 2,164,736
Engineering Design	\$ 1,341,968
Operations and Maintenance	\$ 4,024,665
Plan Review and Erosion Control	\$ 1,045,044
Capital Improvements	\$ 1,792,962
TOTAL	\$ 11,752,097

The third step was to compare Fairfax County to other similar jurisdictions, through a benchmarking survey on other stormwater programs throughout the eastern United States. Eight (8) communities were surveyed through the use of a questionnaire to identify information on stormwater practices, characteristics, levels of service, and funding strategies. Results of this benchmarking exercise showed that the average per capita spending on stormwater for the surveyed communities was \$31.99 and ranged from a low of \$13.88 to a high of \$50.00. For comparison, per capita spending in Fairfax County is \$11.78, which is lower than all communities surveyed.

Finally, as part of the current program assessment, gaps and needs were identified. This work was done in consultation with various Fairfax stormwater staff. The full evaluation of program gaps and needs are listed by function in Chapter III - Section E.

Key needs/issues identified in this process include:

- Limited capital improvements program for water quality and flood mitigation projects.
- Reactive maintenance level of service, with only high risk/high priority needs fully addressed.
- Continuing degradation of streams and the stormwater conveyance system as the system ages.
- Increased complexity in regulatory compliance with mandatory water quality and dam safety requirements.
- Priority need to continue the Watershed Plan initiative to ensure capital improvements focus on needs identified through community input.
- Minimal level of investment in stormwater management on a per capita basis in a dense, urban environment.



PROPOSED LEVEL OF SERVICE

Three level of service options were considered in the evaluation of the stormwater management program in Fairfax County. These options include maintaining the status quo, implementing a comprehensive program through expanded resources over the next 10 years, and increasing capital improvements construction with minimal increases in maintenance and planning to support the new improvements program. Based on the review of the current services, with input from staff and through comparison of Fairfax County to other communities, it is recommended that Fairfax County initiate the process of developing a comprehensive stormwater program, phased in over time in a logical, building block approach. This will put Fairfax County on a path:

- to achieve regulatory mandates for water quality protection,
- to achieve goals identified in the 2003 Strategic Plan,
- to sustain the viability of the existing investment in infrastructure, and
- to achieve the goals established through the Watershed Plan initiative.

Development of a comprehensive stormwater program includes enhancing levels of service in program management, planning, infrastructure maintenance, enforcement of performance standards, capital construction and regulatory controls. Highlights of Key Level of Service Initiatives include:

- Implement capital improvement projects (backlog estimated between \$340 million to \$800 million) over the next 20 to 40 years. These projects will position the County for regulatory compliance and facilitate restoration of the County's streams, 70% of which are in fair to very poor condition.
- Upgrade, within the next 10 years, all public stormwater management facilities so that they function properly. This includes management of the program for major pond rehabilitation projects.
- Implement an enhanced enforcement capability to ensure private facilities are operating as designed.
- Increase public education activity to meet regulatory compliance and to increase public understanding of the goals and activities within the overall program, as well as engage them in participating in stormwater program activities.
- Update and maintain watershed plans on a regular basis to manage capital improvement prioritization.
- Organize the Watershed Planning process by dividing the planning area into quadrants to improve efficiency and effectiveness in overall planning capability. This will support implementation of each Plan's recommendations and meet the schedule to have all studies complete by 2010.

The cost of change in the level of service was evaluated under two scenarios. The first is to build an **optimal program** as quickly as possible and the second is a more **moderate growth** in new resources, targeting capital improvements and maintenance enhancements. Both program cost models were projected over a five-year planning period. The two cost models can be found in Chapter III, pages III-7 and III-8.





The second scenario, the more moderate growth profile, is recommended as the approach the County should take in expanding the level of service for stormwater. The following table provides a summary of the five-year cost estimate, combining current program costs with projected program enhancements. This enhanced program would increase the level of service from \$11.7 million (in FY' 04) to \$28 million in FY'06.

Table III-1 Summary of Cost Projection for Recommended Level of Service

Cost Summary-Moderate	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Total	Percent
Administration	\$ 1,232,260	\$ 1,266,228	\$ 1,301,215	\$ 1,237,251	\$ 1,274,369	\$ 6,311,322	3.1%
Special Programs	\$ 704,000	\$ 663,470	\$ 674,254	\$ 685,362	\$ 696,803	\$ 3,423,888	1.7%
Billing and Finance	\$ 1,992,000	\$ 1,997,760	\$ 2,003,693	\$ 2,009,804	\$ 2,016,098	\$ 10,019,354	5.0%
Planning and Engineering	\$ 3,830,000	\$ 4,137,250	\$ 4,337,664	\$ 4,631,243	\$ 4,753,381	\$ 21,689,538	10.8%
Operations and Maintenance	\$ 4,805,000	\$ 5,485,700	\$ 6,466,031	\$ 7,239,403	\$ 7,883,136	\$ 31,879,270	15.9%
Retrofits/Conveyance Rehab	\$ 5,400,000	\$ 9,800,000	\$ 9,900,000	\$ 9,900,000	\$ 12,400,000	\$ 47,400,000	23.6%
Plan Review and Erosion Control	\$ 1,105,000	\$ 1,138,150	\$ 1,232,441	\$ 1,269,414	\$ 1,307,496	\$ 6,052,500	3.0%
Capital Improvements	\$ 9,040,000	\$ 12,480,000	\$ 15,480,000	\$ 15,480,000	\$ 21,740,000	\$ 74,220,000	36.9%
Total Projected Costs	\$ 28,108,260	\$ 36,968,558	\$ 41,395,297	\$ 42,452,477	\$ 52,071,281	\$ 200,995,873	100.0%

FUNDING OPTIONS

A thorough review of funding strategies available to Fairfax County was evaluated and is presented in Chapter IV. The discussion helps to highlight issues of funding equity (linking revenue sources with those who place a demand on the County for the service) and funding adequacy (the ability of a potential source to produce sufficient and stable revenue). In addition, revenue tools were divided into those with the capacity to fund an entire program (primary sources), and those with the capacity to fund specific program elements (secondary sources).

Primary Funding Methods	Secondary Funding Methods
<ul style="list-style-type: none"> • General Fund Appropriations • Stormwater Service Fees (Stormwater Utility) 	<ul style="list-style-type: none"> • Other Service Fees • Special Assessments • Pro Rata Shares – Capital Projects Only • Watershed Improvement Districts • Federal and State Funding/Grants/Loans • In-Lieu-Of-Construction Fees • General Obligation and Revenue Bonding – Capital Projects Only

While the potential secondary sources of revenue identified above can support specific program elements within the County's stormwater program, there are only two commonly recognized primary funding mechanisms that can create sufficient revenues to support stormwater management in Fairfax. These are the General Fund, supported primarily through the real property tax, and a stormwater utility fee.





Evaluation of the funding tools identifies four funding strategies that are viable to address the primary program of services. As a result, after considering how secondary sources can fund specific program elements, the County's major options for stormwater funding include the following:

- Maintain the status quo, utilizing a mix of general funds and Pro Rata Share.
- Reallocate General Funds from other County services and programs to stormwater management to address an increase in the level of service recommended in Chapter III.
- Raise real property taxes and dedicate a portion to stormwater management to increase the level of service recommended in Chapter III.
- Implement a dedicated stormwater utility fee, relieving the General Fund, increasing the level of service as recommended in Chapter III.

It is recommended that the County adopt a funding strategy that utilizes a stormwater management user-fee as the primary funding tool, including secondary funding mechanisms of Pro Rata Share, Federal and State grants (when available for special projects), and special direct fees (i.e., plan review and inspection fees). This recommendation is based on the need for a stable revenue to sustain a comprehensive program, for equity in the allocation of costs to those who place the highest demand on the County for service, for adequacy in funding all elements of the program strategies, and for flexibility to reward those who invest in building or maintaining components of the system.

STORMWATER USER FEES AND FUNDING OPTIONS

Upon completion of the funding options analysis, an evaluation of rate structure options was completed, addressing rate methodology (i.e., how to assign the cost of services to individual rate payers); and rate modifiers (i.e., credits, tiered residential rates). The rate structure recommendation is based on an evaluation of the methodologies available today that can create a legally defensible allocation of costs to the community. It is critical that a rational nexus between the services provided and the cost of those services to any individual property be established to ensure that the fee structure is legally sound. The options were evaluated using the following criteria:

- Revenue stability and sensitivity to change
- Flexibility of methodology to address level of service
- Consistency with other County financing policies
- Compatibility of cost allocation tool with existing data processing systems
- Data requirements to support allocation of costs to each property
- Cost of implementation and upkeep of the billing database
- Equity in the apportionment of costs

The methodologies reviewed included *imperviousness*, *imperviousness and percent imperviousness*, *imperviousness and gross parcel area*, and *gross area with modifying factors*. Each methodology was evaluated against the criteria listed above and a summary is provided below. A more detailed discussion is included in Chapter V.





Preliminary Recommendation for Rate Methodology: The primary methodology for allocation of costs recommended is “**imperviousness**” on the property with a secondary factor of the **gross parcel area**. Imperviousness has been evaluated and identified as the key contributor to demand for services in stormwater, whether it is for routine drainage, flood controls, public safety, or water quality. There exists a strong body of research detailing the correlation between the development of a parcel and the impacts of that development on the drainage system and the overall services to be provided by local governments throughout the nation. It is recommended that gross area be included as a secondary rate factor to address those services that must be provided regardless of the presence of imperviousness and that should be fairly borne by all properties within the County. This increases the equity of the rate methodology, not limiting it to only land that has been disturbed and by taking into account the total lot size along with the amount of imperviousness.

Modifying Factors: Many modifying factors were considered in the development of the preliminary rate structure recommendation. Upon completion of the evaluation for Fairfax County, the modifying factors of **service charge credits** and a **tiered single family detached housing** rate structure are recommended. Service charge credits provide an opportunity for the County to recognize contributions made by private investment in the drainage system and in water quality protection that reduce the demand for service. A tiered single family housing rate structure also increases the equity by recognizing the varying amount of imperviousness present within this relatively homogenous land use activity. The County should consider whether it wants to place a limit on the number of billing units to be charged single family detached housing, which often occurs in the initial establishment of stormwater utility rates.

Estimated Rate Based on Imperviousness ONLY: Upon completion of the program evaluation and analysis of the projected service enhancements to begin to build a proactive stormwater program, an analysis of potential rates was undertaken. The approach to estimating a rate was to use Imperviousness only as the rate methodology. This was done due to constraints on time, data availability and critical policy decisions that must be made in order to finalize a rate. Basic assumptions regarding fund balance, level of other incomes such as the use of Pro Rata Share and fees for regulatory inspections, debt service and credit initiatives were made to ensure that these issues were not overlooked in the preliminary analysis. If the Board moves forward with this effort, these key policies will be established and factored into a detailed Rate Study.

It is estimated that an initial rate of \$55.00 a year, increasing to \$84.00 a year, for every 2000 square feet of imperviousness could provide sufficient revenue to support the first steps to build a comprehensive stormwater program, over the five year planning period. (NOTE: This is an estimate of the potential rate ONLY.) If the County chooses to move ahead with finalization of the recommendations on program enhancements and funding implementation, a very detailed cost of service and rate analysis will be completed and a refined rate structure with the final recommended rate will be provided. Critical policies will be reviewed and recommended to the Board of Supervisors as part of the final adoption process.

Billing Options for Utility: In order to assess the best method to allocate the costs for a stormwater program to potential payers within a user-fee system, a number of issues must be evaluated in detail. The task of creating a stormwater user fee and distributing that fee to all customers in the service area is a two-part effort. First, an account





database must be created that contains all potential customers and their associated calculated fees. Secondly, the fees must be billed to the customers through a new or existing billing system formatted specifically for the stormwater fee. Billing options evaluated were: use of the Fairfax County Water Authority billing system, use of the Department of Tax Administration (DTA) real estate billing system, and creation of a new, third party operated billing system. Due to conflicts in data management, cost of implementation and other factors highlighted in Appendix III, it is recommended that the DTA billing system be utilized, but issued on a separate stormwater bill that may also include other fees such as the solid waste fees now handled by the DTA. The final recommendation and process will be refined if the Board chooses to proceed with this funding mechanism.

NEXT STEPS

Before the recommended strategy to initiate the first steps in increasing the ability of the County to address stormwater management in a comprehensive approach and to fund program enhancements primarily through a stormwater utility user fee can be implemented, many policy issues must be addressed and a detailed cost of service and rate study must be completed. To accomplish these tasks, the following steps are recommended:

1. A citizen-based advisory committee should be appointed by the Board of Supervisors with the first committee meeting scheduled for September, 2004.

In Appendix IV of this Report a full strategy for appointment and management of a citizen-based advisory committee is discussed. This committee will assist the staff and the consultant to define and craft recommendations on the following key policy decisions:

- Final Program Level of Service
- Final Rate Structure
- Credit Program
- Exemption Policy

The committee will meet with the consultant and staff throughout the fall of 2004, with recommendations completed in February 2005 for consideration in the County budget process.

2. Initiation of a communication plan to raise community awareness of the challenges facing the County on stormwater management issues. This public education program will include a dedicated microsite within the County's Web page, an outreach by staff to the community through a speakers bureau, and use of existing communications tools of the County.
3. Finalization of the recommendation on bill delivery, including the initiation of the master account file development, resolution of issues regarding database integration and finalization of the bill format, frequency and legal requirements for collection.
4. Completion of a Cost of Service and Rate Study to determine a final rate recommendation to the Board of Supervisors including the preparation of appropriate ordinance language.





5. Report to the Board of Supervisors by March 1, 2005, for final action on whether to implement a stormwater utility. This will include a report from the advisory committee, recommendations of various policies, a final rate structure and rate recommendation.



CHAPTER I

HISTORY OF STORMWATER MANAGEMENT IN FAIRFAX COUNTY

The needs and expectations of Fairfax County's citizens with regard to stormwater management have changed dramatically since the mid part of the 20th century when suburban development first began to transform the County's landscape. Between 1930 and 1960, as the County grew from a population of 25,264 to 275,002, stormwater management consisted primarily of the development of disconnected systems of pipes and ditches to serve the needs of individual communities. These systems were built to prevent localized flooding by conveying stormwater runoff to natural channels as efficiently as possible.

In the late 1950s and early 1960s, the County moved to proactively address some of the problems caused by uncontrolled stormwater runoff. The County contracted with the U.S. Geological Survey to delineate 100-year floodplains, and in 1959, the County adopted its first Flood Plain Ordinance. Also in the 1960s, a series of six impoundments were constructed in the Pohick Creek watershed as part of a federally assisted pilot program (PL-566) to attempt to control flooding and sedimentation ahead of anticipated development. This Pohick Watershed Project, approved in 1967, resulted in Woodglen, Royal, Braddock, Barton, Huntsman, and Mercer lakes. Also in 1967, the County adopted the Erosion and Sediment Control Ordinance, which became the model for the State Erosion and Sediment Control Law in 1972.

In 1964, the County adopted its first Policy and Guidelines Manual – the precursor to the Public Facilities Manual. These early guidelines called for adequate drainage for new development, which was usually achieved through simple curb and gutter construction leading to concrete pipes and then the nearest stream. While these new requirements solved flooding problems from smaller storms, they increased peak flows during larger storms, causing severe erosion problems and downstream flooding. During this time, the County began the practice of collecting developer contributions (pro rata shares) for construction of major improvements to downstream channels.

Beginning in the late 1960s and early 1970s, as the County's population surged past 450,000, there was increased recognition that a more comprehensive and systematic approach to stormwater management was needed as natural systems became overwhelmed and flooding and erosion became serious problems. The County began to require all new development to manage stormwater by reducing peak flow rates of the two-year and ten-year design storms to pre-development peak flow rates. The County also incorporated the Environmental Quality Corridor (EQC) policy into the Comprehensive Plan as a way to protect areas adjacent to streams from development.

While these new efforts served to reduce the impacts of new development, several decades of suburban development had already caused significant problems. In an effort to find long-range solutions and to plan for future needs, the Board of Supervisors initiated the development of a Master Plan for Flood Control and Drainage in 1972. This process consisted of dividing the County into nine groups of watersheds. The first



watershed to be studied was the Pohick Creek watershed. The final plan, performed for a group of eleven watersheds collectively called the Occoquan Watersheds, was completed in April 1979. These plans utilized computer-projected runoff simulations through the year 2000 to make recommendations on projects to solve both immediate and future needs. The focus of the plans were on sediment and debris accumulation, bank protection and stabilization, and flood-proofing, with only secondary consideration for water quality and habitat protection.

Water quality concerns started to come to the forefront in the mid-1970s largely in response to the deteriorating condition of the Occoquan Reservoir. On July 26, 1982, the Board of Supervisors down-zoned nearly 41,000 acres of the Occoquan Watershed to the Residential-Conservation (RC) District, or one dwelling unit per five acres. At the same time, the Board created a Water Supply Protection Overlay District (WSPOD), implementing water quality Best Management Practice (BMP) controls on approximately 63,000 acres – the first such requirements in the County.

In the mid-1980s, the County turned its attention to the potential for regional ponds (serving between 100 and 300 acres) to control and treat large areas of development more efficiently than facilities serving individual properties. The use of regional ponds was also seen as a way of reducing the overall maintenance burden. The Board of Supervisors commissioned a study to examine approximately 100 square miles of the developing western portion of the County for potential regional stormwater management pond sites. On January 23, 1989 the Board adopted the Regional Stormwater Management Plan. The original plan identified 134 sites, primarily in the western part of the County. Currently, there are approximately 150 planned regional pond facilities, with 46 sites actually constructed and operational.

The focus of stormwater management continued to shift towards water quality and habitat protection in the mid-1980s with the 1987 amendments to the federal Clean Water Act and the 1987 Virginia Chesapeake Bay Preservation Act. In response to the Chesapeake Bay Preservation Act, the Board of Supervisors adopted the Chesapeake Bay Preservation Ordinance (CBPO) in March 1993. The CBPO protected certain areas along tributary streams as Resource Protection Areas (RPAs). The CBPO also effectively extended the water quality BMP requirements adopted for the Occoquan Watershed to County-wide.

The 1987 Clean Water Act amendments required the County to obtain a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Department of Environmental Quality to discharge stormwater through its municipal separate storm sewer system. Originally issued by the County on January 24, 1997, the permit was re-issued on January 24, 2002. The permit allows the County to discharge stormwater through its outfalls provided that the stormwater is managed to reduce nonpoint source pollution to the “maximum extent practicable.” This permit has been a significant driver behind the County’s current stormwater management program.

The late 1990s witnessed additional significant changes as the Total Maximum Daily Load (TMDL) requirements of the federal Clean Water Act focused efforts on cleaning up specific stream segments designated as violating State water quality standards. A total of 17 streams draining portions of Fairfax County are on the State’s 2002 “impaired waters” listing, with additional streams likely to be added in 2004. TMDLs have been developed for Accotink Creek and Four Mile Run. A significant outgrowth of the TMDL



requirements was the Chesapeake Bay 2000 Agreement, which committed Virginia to removing the Chesapeake Bay from the U.S. EPA's list of impaired waters by the year 2010. While the 2000 Chesapeake Bay Agreement is non-regulatory, failure to meet its water quality commitments could result in the imposition of a TMDL on the entire Chesapeake Bay watershed.

At the turn of the 21st century, as the County's population surged toward the one million mark, the County's stormwater program again shifted. In 1998, the County launched an ambitious stream protection initiative that reflected a new focus not only on chemical water quality but on the health of the aquatic ecosystem. The Stream Protection Strategy (SPS) Baseline Study, published in January 2001, provided a snapshot of the condition of the County's streams using biological indicators. Based on the results of this study, the County commenced a watershed planning initiative in October 2001 to develop Watershed Management Plans for all 30 watersheds over a five to seven year period. The new Watershed Management Plans will update the Master Drainage Plans for flood control and storm drainage improvements developed during the 1970s. In addition to storm drainage and flood control, the plans will also address the restoration of stream habitat and implementation of strategies to protect stream ecosystems. These Watershed Management Plans also represent a shift in how the public is involved in stormwater management – both as a way to educate the public about stormwater issues and to foster public support for proposed solutions.

The County has also begun to integrate this new focus into older plans and policies. In January 2001, the Board of Supervisors accepted an Infill and Residential Development Study that provided recommendations to increase the effectiveness of policies regarding erosion control and storm drainage. In early 2002, the Board of Supervisors, reacting to increased citizen concern over the effectiveness of the regional pond program created a subcommittee to examine the role of regional ponds as well as other alternative types of stormwater controls as watershed management tools. The resulting document, called *The Role of Regional Ponds in Fairfax County's Watershed Management*, provides a framework to help facilitate the merging of stormwater management goals with watershed protection and restoration goals. Also in 2002, the Board celebrated the 20th anniversary of the Occoquan Watershed downzoning. This celebration included the establishment of a New Millennium Occoquan Watershed Task Force, which presented a series of recommendations to the Board on January 27, 2003 to address emerging watershed management issues.

While traditional means of stormwater management are still an integral part of the County's program, the shift towards protection of aquatic habitats has brought stormwater management full circle in that many techniques are now designed to retain stormwater on-site and allow infiltration into the soil. Techniques such as low impact development, or LID, aim to reduce or eliminate the impacts of impervious surfaces through natural systems and the incorporation of micro-BMPs such as rain gardens. At the same time, the County has also shifted from a protection paradigm to a restoration paradigm, working with citizens and watershed organizations to stabilize and restore stream reaches degraded by over a half century of stormwater impacts.

In 2003, as part of larger County-led effort, the leadership of the Stormwater Business Area of the Department of Public Works and Environmental Services engaged in a strategic planning exercise as a way to help refocus stormwater management efforts in light of new paradigm shifts, increasing expectations of County citizens, and an



increasingly complicated State and federal regulatory framework. The effort included interviews with outside stakeholder groups and a series of facilitated work sessions to identify major issues as well as strengths, opportunities, weaknesses, and threats. Two basic themes emerged from this process – (1) that levels of service for stormwater management should be based on a clear understanding of actual needs, and (2) that the selected level of service must be supported by an adequate and stable source of funding. To address these issues, and to provide a decision making tool for the Board of Supervisors regarding levels of service and funding mechanisms, the Strategic Plan contained tactics to “develop a funding plan for programs to reflect changing service levels, increased infrastructure inventories, unfunded mandates, and emergency events” and to “develop and implement a funding feasibility study for alternative methods and funding sources.” This Watershed Community Needs Assessment and Funding Options Study, presented in the following pages, implements these tactics and represents the first step towards positioning the County to meet its strategic stormwater management goals.



CHAPTER II

STORMWATER PROGRAM ASSESSMENT

A. CHAPTER SUMMARY OF PROGRAM ASSESSMENT

Following this summary are sections which discuss the current types of stormwater services and levels of service provided in Fairfax County. In addition, this assessment compares the levels of service provided by Fairfax County against a benchmark of similar U.S communities as one method to evaluate the need for change in levels of service. Finally, this Chapter will identify the gaps, issues, and needs in stormwater operations and management, that must be undertaken in order for Fairfax County to begin to address the goals and objectives identified in the Strategic Plan, as well as to bring the stormwater system up to acceptable performance in protecting public health and safety.

The first step in assessment of the current program was the review of the role of watershed planning in the County Stormwater Program. In conjunction with the recently completed Stream Protection Strategy report and the Strategic Plan prepared for the stormwater management group, the Watershed Plans were found to provide the critical technical foundation for future capital improvement work. Public participation in these studies provides an opportunity for the County to educate the public about the major stormwater issues in their neighborhoods, while receiving feedback about the types of projects and initiatives they are willing to support. This combination of technical assessment and community involvement is the key to building a program that meets the central mission of the stormwater program “to develop and maintain a comprehensive watershed and infrastructure program that will protect public health and safety and will enhance the quality of life in Fairfax County.”

The second step in the assessment was the identification of the current types and levels of services provided in Fairfax County. Section C below gives a detailed overview of the current services provided, organized by functional cost center. By assigning services to one of eight key functional areas, activities and costs were organized so that the overall levels of service could be determined and evaluated against other similar stormwater programs in the benchmarking process (see Appendix I for the full report on Benchmarking). The result of assigning specific tasks and associated costs to each service area (i.e. Operations and Maintenance, Watershed Planning, Engineering, etc) was the development of a stormwater program cost estimate by function. In Fiscal Year (FY) 2004, Fairfax County spent approximately \$11.7 million on stormwater related activities, distributed as shown in the following table.



Current Estimated Cost of Operation - 2004

Administration	\$ 1,072,260
Special Programs	\$ 179,036
Billing and Finance	\$ 131,427
Watershed Management - Planning	\$ 2,164,736
Engineering Design	\$ 1,341,968
Operations and Maintenance	\$ 4,024,665
Plan Review and Erosion Control	\$ 1,045,044
Capital Improvements	\$ 1,792,962
TOTAL	\$ 11,752,097

The third step was to compare Fairfax County to other similar jurisdictions, through a benchmarking survey on other stormwater programs throughout the eastern United States. Eight (8) communities were surveyed through the use of a questionnaire to identify information on stormwater practices, characteristics, levels of service, and funding strategies. Results of this benchmarking exercise showed that the average per capita spending on stormwater for the surveyed communities was \$31.99 and ranged from a low of \$13.88 to a high of \$50.00. For comparison, per capita spending in Fairfax County is \$11.78, lower than all communities surveyed.

Finally, as part of the current program assessment, gaps and needs were identified. This work was done in consultation with various Fairfax stormwater staff and considered such issues as the need to continue to meet existing regulatory mandates (National Pollutant Discharge Elimination System (NPDES) permit); to prepare for new requirements (additional TMDL allocations); to minimize backlog of facility retrofits, conveyance system, and capital improvements; to improve execution of work orders in response to citizen complaints; and to increase public outreach and involvement on stormwater issues. The program gaps and needs are listed by function in Section E below.

Key issues identified in this process include:

- Limited capital improvements program.
- Reactive maintenance level of service, with only high risk/high priority needs addressed.
- Continuing degradation of the stormwater conveyance system as the system ages.
- Priority need to continue Watershed Plan initiative to ensure capital improvements focus on needs identified through community input.
- Regulatory compliance with mandatory water quality and dam safety requirements.
- Minimal level of investment in stormwater management on a per capita basis in a dense, urban environment.

B. ROLE OF WATERSHED PLANNING

Planning is a critical component in the overall management and operation of any infrastructure, project, program, or activity. Creating public support and instilling





confidence in the utilization of public resources requires a strategic vision of the desired outcome so that elected officials, staff, and citizens have expectations that are realistic and achievable within the constraints of time and funding. The County has initiated two important components of planning within the Stormwater Program. One is an organization-wide strategic planning initiative which, in 2003, resulted in an Environmental Scan and Strategic Plan for stormwater. The second is the study of all the watersheds in the County, which are scheduled for completion by 2010. These plans (there are 30 watersheds) become the foundational guide to creating an effective strategic vision for the long-term viability of the stream health and infrastructure performance throughout the County. This work is important as a guide to investment of limited funds in capital improvements, ensuring that those resources are wisely utilized to be effective in sustaining performance of the infrastructure. In the past it has been difficult to implement capital improvements due to lack of community support. To address that problem, the new watershed planning studies include increased public involvement to better understand the needs and priorities of the community and to develop capital programs that the community will support. Reinvestment in the system, without the guidance of Watershed Plans and public input, can result in wasteful spending and increased system failure.

Since the early 1990's, several other positive changes have taken place in the County's Stormwater Management Program. As a result of their first NPDES Phase I Permit in 1997, the County began focusing its program on water quality protection, as well as water quantity control. In 1998, the funding of the Stream Protection Strategy (SPS) resulted in the designation of 30 watersheds and establishment of 114 principal monitoring sites spread throughout the watersheds. At these sites, data was gathered on in-stream features, biological diversity, habitat, and flow. The SPS study provided valuable information on the condition of the County's streams and led to the next phase of stream protection, which was to revise the method to assign Resource Protection Area (RPA) status to local water bodies by using perennial flow. After receiving State approval of revised perennial stream protocols, the County surveyed (between 2002 and 2003) the headwater reaches of streams to designate perennial streams upstream of the original RPAs that were established in 1993. As a result, the length of the perennial streams in the County increased from over 600 miles to over 800 miles. These changes were adopted by the Board of Supervisors in 2003 as amendments to the County's Chesapeake Bay Preservation Ordinances.

Now that information has been gathered on the locations and types of problems in the County's stream network, the next step in the County's watershed protection strategy is the development of Watershed Management Plans for all 30 watersheds. The Stormwater Planning Division has been designated to lead the effort to develop watershed management plans for all watersheds, sub-watersheds, and/or groupings of watersheds by 2010. The schedule for the completion of these plans has been made part of the County's Virginia Pollution Discharge Elimination System (VPDES) permit. To date, watershed planning studies are underway in six watersheds including Little Hunting Creek, Popes Head Creek, Difficult Creek, Cub Run, Cameron Run and Bull Run.

A vital step in developing a County-wide comprehensive stormwater program will be the evaluation and prioritization of the water quality protection needs of the community. The Watershed Management Plans are intended to accomplish this by providing a consistent basis for the evaluation and implementation of solutions for protecting and restoring the





health of receiving waters and other natural resources of the County. A key component of reaching this goal is to include an active public involvement program in each watershed planning study. By reaching out to the public, educating them about the issues in their watersheds, and asking for feedback on proposed solutions, the County hopes to develop plans that can be implemented with the full support of the community.

C. SUMMARY OF CURRENT STORMWATER SERVICES

1. ORGANIZATION

a. COUNTY ORGANIZATION

Fairfax County is governed under the Urban County Executive form of government with executive powers vested in an elected Board of Supervisors. The Board consists of nine members elected by district, plus a Chairman, elected at large. The Board of Supervisors establishes County government policy, passes resolutions and ordinances, approves the budget, sets tax rates and fees, and approves land use plans. Board members are elected for four-year terms and there is no limit to the number of terms a member can serve. The next Board election is scheduled for November 2007, with Board members taking office in January 2008.

The Board appoints the County Executive, who is the administrative head of the County government. Among other activities, the Office of the County Executive plays in a key role in:

- Strategic planning for the County
- Fostering partnerships within the community
- Preparing the County's annual budget
- Executing all resolutions and orders of the Board of Supervisors.

The County Executive also oversees the functional departments of the County, including departments responsible for financial services, human resources, economic development, public safety, recreation, information technology, and public works.

b. DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL SERVICES

The Department of Public Works and Environmental Services (DPWES) is a multi-faceted agency providing the County with a wide range of services including construction of roads and utilities, construction and maintenance of County facilities and infrastructure, and enforcement of state and local codes relating to building planning and construction, land development, transportation, waste management, and other environmental protections. Specifically, DPWES is organized into six primary business areas:

- Capital Facilities (CAP) - which supports the design and construction of libraries, courts, public safety buildings, governmental facilities, and infrastructure improvement projects. Included in this business area are the following subgroups: the Construction Management Division, the Land Acquisition Division, and the Planning and Design Division.





- Facilities Management (FAC) – which is responsible for providing building services for County-owned and leased facilities and for leasing, managing, and disposing of real property. This business line includes the Facilities Management Division.
- Land Development Services (LDS) – which is responsible for ensuring that all development in Fairfax County meets all applicable health, safety and building codes. There are 12 subgroups in this business line including the Office of Building Code Services, the Office of Site Development Services, the Environmental and Facilities Inspections Division, the Code Enforcement Division, and the Permits Division.
- Solid Waste Management (MSW) – which provides solid waste collection, disposal, and recycling services for the County. This business line includes the Division of Solid Waste Collection and Recycling and the Division of Solid Waste Disposal and Resource Recovery.
- Wastewater Management (WWM) – which provides wastewater treatment and collection services for the County. This business line includes the Wastewater Collection Division, the Wastewater Planning and Monitoring Division, and the Wastewater Treatment Division.
- Stormwater Management (STW) – which provides engineering design, project management, contracting, monitoring, and maintenance services for street name signs, storm drainage, flood control, water quality protection, commercial revitalization, roads, and other County infrastructure. This business line includes the Maintenance and Stormwater Management Division and the Stormwater Planning Division.

c. STORMWATER MANAGEMENT DIVISIONS

Management of the majority of the County's stormwater functions lies in two divisions within the Department of Public Works and Environmental Services – the Maintenance and Stormwater Management Division and the Stormwater Planning Division. Supported by other county, regional, and state agencies, these two business units are tasked with “developing, promoting, and implementing strategies that protect the County's stormwater infrastructure and preserve and improve the natural ecosystem”. Their mission has three key components:

- To develop and maintain a comprehensive watershed and infrastructure program that will protect public health and safety and will enhance the quality of life in Fairfax County,
- To plan, design, construct, operate, and maintain the infrastructure in compliance with all government regulations, and
- To be responsive and sensitive to the needs of the County's residents, customers, and public partners.

The Maintenance and Stormwater Management Division (MSMD) provides maintenance and rehabilitation on the existing stormwater infrastructure. Maintenance services are provided in an effort to manage the capture and conveyance of stormwater runoff in order to mitigate flooding and improve the water quality of local water bodies. MSMD provides inspection and oversight of public and privately maintained stormwater





management facilities, as required by state and federal water quality permits and provides support during emergency response (mostly flooding) operations.

In fiscal year 2004, MSMD had 100 full-time equivalent (FTE) authorized positions. Of these, approximately 71 were assigned to stormwater-related services and 29 were assigned to other activities including maintenance of park-and-ride facilities, trails and walkways, public street signs, and commercial revitalization. In addition to in-house work forces, the division uses contracted services to meet some of their maintenance requirements, such as dam embankment mowing and some channel and riser cleaning.

The Stormwater Planning Division (SPD) provides stormwater planning, monitoring, capital project design, and floodplain management services. This division is responsible for compliance and reporting related to the National Pollutant Discharge Elimination System (NPDES) stormwater permit. SPD also coordinates state mandated dam safety operation and maintenance certificates, emergency action plans related to flooding, watershed management efforts, stream monitoring and assessments, and public education and outreach initiatives.

In fiscal year 2004, SPD had 27 FTE authorized positions. All positions perform stormwater-related planning and design services. Like MSMD, SPD uses contracted services to help meet their resource demands, specifically in the areas of monitoring and master planning.

2. CURRENT PROGRAM ELEMENTS

The County’s stormwater management program consists of dozens of smaller operations that function together to meet the County’s stormwater needs. These smaller operations have been divided by functional cost centers to help further identify the many activities within the stormwater program, as well as to help quantify the resources assigned to each function. Table II.1 shows how these functions can be combined into eight (8) functional centers.

Table II-1 – Major Stormwater Management Functional Cost Centers

<p>1. Administration & Management General Administration Purchasing HR Functions General Program Planning & Development Budget and Cost Controls Contract Management Legal Services Facilities Management</p> <p>2. Special Programs Public Education/Outreach GIS, Mapping and Database Management Inter-Agency Cooperative Activities</p> <p>3. Billing and Finance Billing Operations</p>	<p>5. Engineering & Design Design Criteria, Standards and Guidance BMP Analysis & Design Design, Field and Operations Engineering Hazard Mitigation Dam Safety Program Retrofitting Program Flood Insurance Program Community Rating System</p> <p>6. Operations & Maintenance General Maintenance Management SW Management Facilities Maintenance Conveyance System Maintenance General Remedial Maintenance Emergency Response Maintenance Infrastructure Management</p>
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<p>3. Billing and Finance (cont) Customer Service Financial Management Capital Outlay</p> <p>4. Watershed Management Planning Watershed Planning BMP Development Comprehensive Monitoring Program Stream Protection and Restoration BMP Programs and Activities Used Oil & Toxic Materials Spill Response and Clean Up Program for Public Education & Reporting Illicit or Cross Connections Illegal Dumping Multi-objective Planning Support Zoning Support Landfills and Other Waste Facilities</p>	<p>6. Operations and Maintenance (cont) GASB 34 Field Data Collection (inventory) Public Drainage System Inspection and Regulation Private Facilities Inspection & Regulation Public Assistance/Complaint Response</p> <p>7. Plan Review and Erosion Control General Code Development & Review Stormwater System Inspections – new dev. Regulatory Enforcement General Permit Administration Erosion & Sediment Control Program</p> <p>8. Construction Services Capital Improvements Construction Project Management Inspections Land, Easement, and R-O-W Acquisition</p>
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The following section provides an overview by function of the key stormwater program operations in Fairfax County:

a. ADMINISTRATION & MANAGEMENT

- General Administration – DPWES staff perform general administrative functions including purchasing, warehouse management, human resources activities, and budget management.
- General Program Planning & Development - Budget document preparation and staff from each DPWES division performs cost control functions.
- Contract Management – DPWES staff are responsible for administration of vendor contracts for such services as mowing and culvert maintenance and professional services contracts.
- Legal services – The County Attorney office provides advice and support to DPWES on legal issues.

b. SPECIAL PROGRAMS

- Public education and outreach – In the past, public dialogue on the County's stormwater activities was limited to public presentations and sporadic involvement at County events. The County is now taking a more proactive approach by engaging the public through the watershed planning program. The public involvement program for the watershed study work includes: citizen advisory groups, public meetings, assistance with the formation of community watershed groups, and an overall Public Education Campaign with an interactive website aimed at educating the public about their watersheds.
- GIS, mapping and database management – The inventory of stormwater management and storm sewer facilities is documented and tracked through use of the County's mapping system. The documented inventory of storm drainage infrastructure is currently being digitized in a GIS format with planned completion scheduled for 2005.





- Interagency Cooperative activities – DPWES works with numerous other local, regional, and state agencies to promote water quality protection through a wide range of activities. Some specific examples include: working cooperatively with the County Health Department which prepares the annual water quality report and monitors West Nile Virus issues; partnerships with the Northern Virginia Soil and Water Conservation District (NVSWCD) and the Virginia Department of Forestry (VDOP) to perform stream stabilization projects; partnership with the Northern Virginia Regional Commission (NVRC) to develop a regional pollution-prevention outreach strategy; partnerships with the United State Geological Survey (USGS), the Virginia Department of Conservation and Recreation (DCR), and the Virginia Department of Environmental Quality (DEQ) to pursue bacteria source tracking for Accotink Creek as part of a statewide TMDL study and other various on-going cooperative working relationships with the Engineers and Surveyors Institute (ESI), the Northern Virginia Building Industry Association (NVBIA), and the Council of Governments (COG).

c. BILLING & FINANCE

- Capital project financing – The Capital Facilities business area provides financial support to the stormwater program through several of its divisions. This includes processing of invoices and work orders and management of all revenue streams. The Planning and Design Division provides cost estimating services, the Construction Management Division advertises projects, open bids, and recommends contract awards, and the Administrative Support Branch provides purchasing, accounting, and budgeting services.

d. WATERSHED MANAGEMENT PLANNING

- Watershed Planning – The County is in the process of developing Watershed Master Plans for all 30 of its watersheds. Watershed plan development for entire watersheds, sub-watersheds and/or groupings of watersheds is being implemented over an anticipated six-year period. To date studies of the following areas are underway: Little Hunting Creek, Popes Head Creek, Difficult Creek, Cameron Run, Bull Run, and Cub Run. The goal of the watershed plans is to provide an assessment of management needs and prioritized solutions within each watershed so that the County can provide watershed protection in a consistent manner. Citizen input is an important component of the watershed planning effort with the County developing an extensive public involvement campaign to ensure the community has input to the plans.
- BMP Development – The County continues to work with developers and engineers in the area by providing guidance on such issues as low impact design techniques and innovative BMPs to promote land use practices that improve water quality in the County. The County provides design standards and application conditions to assist with appropriate BMP implementation.
- Monitoring – The County is involved in several types of monitoring activities including: continued extensive county-wide water quality monitoring as part of the NPDES program; biological monitoring of bacterial levels, macroinvertebrates, and fish, begun as part of the Stream Protection Strategy surveys; environmental monitoring at specific development projects to evaluate sediment removal efficiencies of planned erosion and sediment controls; and a floatables



monitoring program performed in coordination with the County's Adopt-A-Stream program.

- Stream protection and restoration – The County has partnered with other regional organizations to perform several stream stabilization projects recently with the main purpose to reduce stream erosion and sediment build-up and to protect infrastructure in the Chesapeake Bay watershed.
- BMP programs – The County's stormwater control program has the goal of ensuring the collection, detention, and control of the discharge of sediment and stormwater-related pollutants to local streams. A key requirement of their program is to limit post development runoff to that which does not exceed pre-development runoff rates. This is accomplished by requiring installation and proper maintenance of acceptable Best Management Practices (BMPs) such as: on site detention and regional ponds, ponds incorporating water quality treatment, underground chambers, percolation trenches, and other newer Low Impact Development (LID) techniques, such as rain gardens. The County has recently been sending letters to industry on the selection and use of BMPs. These letters are one of the initial steps in adopting and encouraging the use of better site design and LID techniques for improving water quality in the County.
- Spill prevention and response – The Fire & Rescue Department responds to all reported incidents of hazardous material, spills, and discharges. Their Hazardous Materials & Investigative Services Section (HMIS) investigates hundreds of spills each year. DPWES staff members receive regular training in pollution prevention measures and in proper response procedures for incidences where spills may be exposed to stormwater.
- Watershed public education program - Citizen input is an important component of the watershed planning effort. The County is developing an extensive public involvement campaign to ensure the community has direct input to the plans.
- Illicit connections – The County has a dry weather screening program as part of its NPDES permit. The goal of this program is to detect illicit connections and improper discharges to the local surface waters.
- Planning and zoning support – DPWES enforces the Zoning Ordinance and the Subdivision Ordinance criteria related to stormwater for new development and redevelopment through its plan review process.
- Used oil and toxic materials, illegal dumping – The Fire & Rescue Department's Hazardous Materials Services section acts as an agent of the Director of DPWES to permit and enforce activities related to control of toxic materials, including enforcement of illegal dumping regulations. This includes the investigation of improper disposal of petroleum and toxic materials. Fire & Rescue responded to 278 incidences in 2003 that had the potential to discharge prohibited materials into storm drains or local surface water bodies.
- Landfills and other waste facilities – The Division of Solid Waste Disposal and Resource Recovery is responsible for the operations of the County landfills. This includes performance of compliance activities as required by their VPDES General Permits. Solid Waste staff perform quarterly visual inspections at stormwater outfalls and semi-annual sampling of discharge storm water. The Solid Waste Division maintains waste facility test results and inspection reports.

e. ENGINEERING & DESIGN

- Design criteria and standards – The County is working with the Northern Virginia Regional Commission on the revision of the Northern Virginia BMP Handbook.



- The handbook revision will provide guidance to developers and engineers so that they can develop acceptable site plans regarding stormwater management. The handbook will include standard calculation methodologies for BMP sizing, as well as expected maintenance efforts of the built BMPs.
- BMP Analysis and Design – The design staff of SPD performs analysis on BMP submittals, contributes to the updating of the design standards handbook, and assists in the preparation of designs for public facilities.
 - Design for field operations – The design staff of the SPD is responsible for scope development, design, and project management of storm drainage improvements. Typical projects include stream bank stabilization, flood proofing of dwellings, design for repairs of existing dam embankments, and retrofitting of existing retention and detention ponds.
 - Hazard mitigation – As part of the statewide program to minimize hazards from flooding and other natural occurrences, the DPWES works with other County agencies to keep their hazard mitigation plans updated and their staff trained in recommended mitigation activities. SPD staff act as technical consultants to the Hazardous Management group.
 - Dam safety program – County staff inspect all PL-566 dam facilities every fall in order to identify any safety or operational items in need of corrective action. In addition, either a contracted engineering firm or in-house professional engineer performs a biennial inspection to check the stability of the dam embankment and the functioning of the water control structures. State operating permits are valid for six-years and must be reissued at the end of each permitting period. The permit re-issuing is tied to the most recent County inspection.
 - Retrofitting program – The County annually rehabilitates or retrofits as many stormwater management facilities as funding allows. In 2003, ten (10) County maintained stormwater management ponds were rehabilitated and/or retrofitted.
 - Floodplain management – Fairfax County restricts development and disturbance within any floodplain served by a drainage area greater than 360 acres. Together with the zoning restrictions, which limit development within the 100-year floodplain, this program reduces flood risks and protects public safety. Also, as part of the County floodplain management function, Resource Protection Areas (RPAs), determined by field investigations, are evaluated for technical correctness.
 - Community rating system – Under this program, the Federal Emergency Management Agency (FEMA) reviews and assesses the County's floodplain program and assigns scores, which are then used to determine the National Flood Insurance Rates throughout the County. The County then advises owners of property or structures located within floodplains of their Federal insurance obligations and ensures that all structures within FEMA flood zones are insured.

f. OPERATIONS AND MAINTENANCE

- Stormwater management facilities maintenance – The County is responsible for mowing of earthen dams approximately once per year. They also identify physical problems and remove blockages and debris. In 2003, maintenance work orders were required on more than 20% of the over 1,000 facilities
- Conveyance system maintenance – The County maintains approximately 1400 miles of storm sewer and 800 miles of streams. The storm drainage conveyance system is scheduled to be inspected once every 5 years. It is the responsibility



- of the County to identify problems and to remove major blockages in the drainage system, to repair safety hazards, and to repair damaged structures.
- Emergency response – DPWES staff often respond to emergencies involving flooding and hazardous chemical spills. Staff assist with blockage removals, sand-bagging, and spill containment.
 - Government Accounting Standards Board – Statement 34 (GASB 34) – This is a mandated program which requires the County to report the current value of all capital assets, including its storm sewer and stormwater management inventories. Currently, the County has inventoried all ponds and water control structures and is about half done with the remaining inventory of pipes and drainage systems.
 - Field data collection (inventory) – The County annually field verifies and inspects at least one-fifth of its storm drainage system in compliance with its NPDES permit.
 - There over 1,100 public stormwater management facilities maintained by the County. These public stormwater facilities are inspected once per year.
 - Private stormwater management facilities inspection – The County conducts inspections of wet ponds and dry ponds located within commercial, and some residential, developments, along with inspections of certain underground chambers and percolation trenches. They also conduct inspections and enforcement of maintenance agreement terms for privately maintained facilities. In compliance with the County’s NPDES permit, each facility is inspected at least once every five (5) years in order to ensure these facilities are maintained and operated consistent with industry standards. The current inventory includes over 2,200 privately maintained facilities.
 - Public assistance and complaint response – The County received about 1,600 drainage complaints in 2003. When a call comes in, it is screened to determine whether it is an emergency or non-emergency. Assuming a non-emergency, it is logged, entered into the database, and assigned to a technician to research and respond. The goal is to schedule a meeting with the complainant within one (1) business day and to write a work order, if necessary, within five (5) business days. Due to limited resources, the average time to perform the work order on high priority activities is often 25-30 days. A low priority (category 3) may take up to six months. During emergency situations, complaints are handled by senior supervisors and prioritized and responded to as quickly as possible.

g. PLAN REVIEW AND EROSION CONTROL

- General code development and review – The DPWES works with other County and regional agencies to review and update codes and ordinances related to stormwater management. This includes Zoning and Subdivision Ordinances, the Chesapeake Bay Preservation Ordinance, building and dam safety codes, erosion and sediment control initiatives, and BMP design and development requirements.
- Inspections of stormwater systems for new development - DPWES enforces the Zoning Ordinance and the Subdivision Ordinance criteria related to stormwater for new development and redevelopment through its plan review and inspection process.
- Regulatory enforcement – The County enforces compliance with the Chesapeake Bay Preservation Ordinance through the development review and inspection process and enforces compliance with the NPDES program through ordinances, training, public information and plan review.





- There are 17 stream segments that drain portions of Fairfax County that are on Virginia's 2002 "impaired waters" list for violating State water quality standards. Under the federal Clean Water Act, TMDLs (Total Maximum Daily Loads) must be developed to determine the sources of the impairment and to allocate needed reductions. Fecal coliform bacteria TMDLs have already been developed for Accotink Creek and Four Mile Run, with the remaining TMDLs scheduled to be developed between 2006 and 2014. It is likely that additional stream segments will be added to the impaired waters list when DEQ performs its biannual update in 2004.
- General permit administration – The County tracks compliance with their regulatory permits, prepares new and revised applications, and prepares annual reports, as required for the NPDES stormwater permit.
- Erosion and sediment control – The Environmental and Facilities Inspections Division (EFID) of DPWES performs plan reviews and E&S inspections on construction sites in Fairfax County. In 2003, there were 328 Erosion and Sediment Control Plans submitted and approved by the County.

h. CONSTRUCTION SERVICES

- Capital improvements – The majority of stormwater capital improvement work ongoing in the County is related to the regional pond program and to major stormwater drainage improvements and is funded partially through the Pro Rata Share Program. Over the past few years, between \$1.5 and \$3 million has been spent annually on stormwater capital improvements. Staff estimates the capital reinvestment need is between \$340 million and \$800 million to address system performance and long-term structural integrity of the drainage system.
- Construction project management – County staff manage the scoping, engineering design, and construction oversight of their capital improvement projects.
- Land, easement, and right-of-way acquisition – Land acquisition and easements for stormwater capital projects are handled on a case-by-case basis by the Land Acquisition Division of DPWES.

3. CURRENT ESTIMATED COST OF SERVICES – FY '04

The following table (Table II-2) summarizes the approximate dollars and full time equivalent (FTE) staff time currently being dedicated to each element of the stormwater Program in Fairfax County. A more detailed breakdown of these costs is included in Appendix II. Table II-3 presents the same current cost information by budgetary category.



Table II-2 Current Stormwater Management Costs by Function

Functional Cost Center	Estimated Costs	Personnel FTE
Administration	\$ 1,072,260	12.00
Special Programs	\$ 179,036	3.50
Billing and Finance	\$ 131,427	2.50
Watershed Management - Planning	\$ 2,164,736	11.00
Engineering Design	\$ 1,341,968	12.80
Operations and Maintenance	\$ 4,024,665	57.23
Plan Review and Erosion Control	\$ 1,045,044	12.00
Capital Improvements	\$ 1,792,962	4.10
TOTAL	\$ 11,752,097	115.13

Table II-3 Current Stormwater Costs by Budget Category

Major Expenditure Categories	Estimated Costs	% of total
Labor Costs with Benefits	\$ 6,431,659	54.70
Operating Expenses	\$ 895,245	7.60
Contracted Services	\$ 225,000	1.90
Capital Equipment	\$ 210,000	1.80
Capital Outlay	\$ 3,990,193	34.00
TOTAL	\$ 11,752,097	100

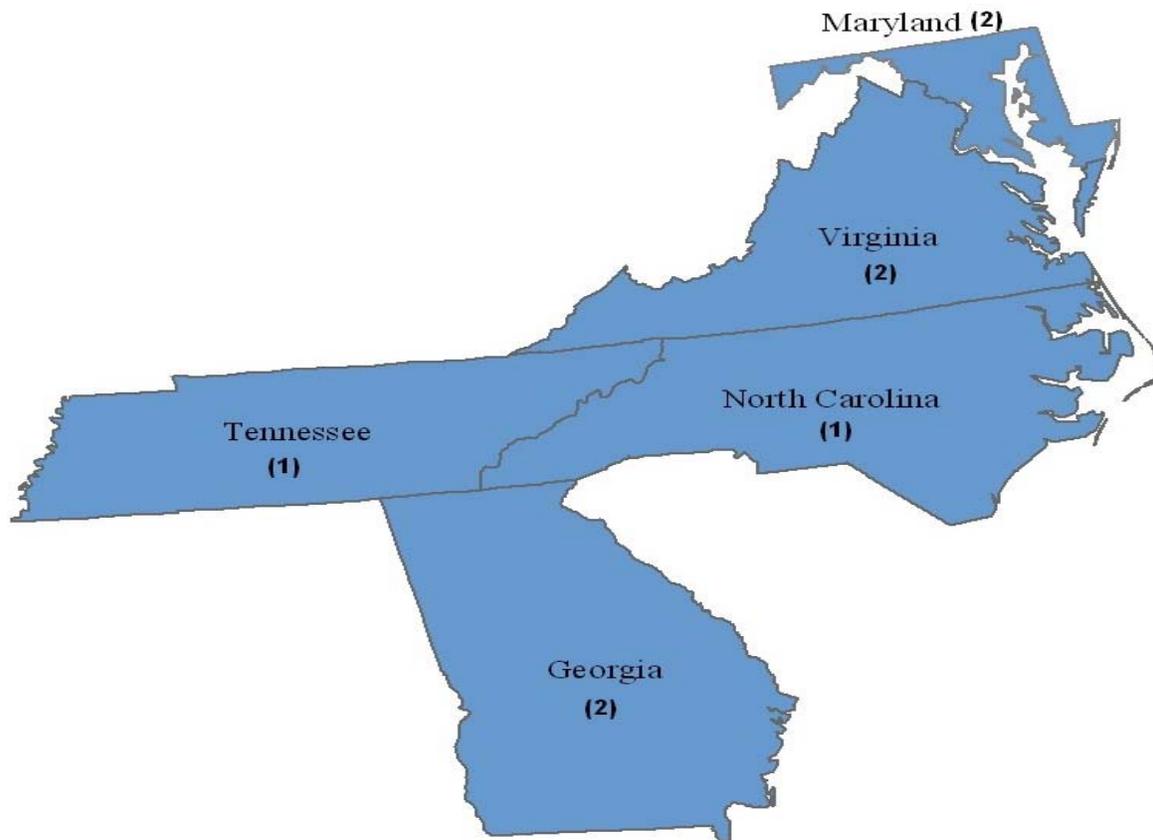
D. BENCHMARKING TO OTHER COMMUNITIES

1. INTRODUCTION

The purpose of the stormwater management program benchmarking analysis was to gain a better understanding of the current state of the Fairfax County Stormwater Management Program and how Fairfax's program may compare to other major urbanized communities from around the mid-Atlantic region and the eastern United States. The study examined a group of localities from the eastern United States, with a concentration on the mid-Atlantic and southeastern United States, that, in the estimation of the County staff, are reasonably representative of the conditions found in Fairfax County and will provide a defensible measuring stick against which to benchmark the County's stormwater services. The list of communities examined can be found in Appendix I. The geographic breakdown of the study area is shown graphically on the following page.



Figure II-1 Distribution of Benchmarked Communities



The participating communities each completed a benchmarking questionnaire that sought to measure a number of different stormwater management practices, characteristics, policies, procedures, and funding strategies. The benchmarking questionnaire used for this study can be reviewed in Appendix I. Each community was contacted directly and the survey forwarded to the respondent for review. Each respondent was then contacted again by phone to review answers and to clarify any questions or provide further comment on the respondent's answers.

2. SUMMARY OF DATA

In order to organize the results, the questions included in this survey have been cataloged into four broad categories:

- Basic Data: including demographic, topographic, hydrologic, and land use characteristics;
- Program Data: including a number of topics related to services provided by the communities examined, including regulatory programming, operational services, planning, and capital improvement programming;
- Physical System Data: including information on whether they provide services on private, as well as public facilities, as well as information on some of the physical characteristics of that system; and

- Budget and Funding Data: including community budget allocations for stormwater services as well as community funding approaches for those services.

Examination of these benchmarks will provide Fairfax County with a tool to measure its own programs' level of service and to highlight potential programming decision points that may lead to policy and programming adjustments. A summary of the results of the surveyed data from each of these categories follows below.

a. BASIC DATA

An examination of the basic data gathered for the survey notes that the populations serviced by their stormwater programs ranged from roughly 230,000 to 826,000 in population (based on 2002 population numbers), and the vast majority include urbanized counties with significant unincorporated areas for which the Counties surveyed provide some level of stormwater management services. In comparison, Fairfax County is a large urbanized County with a population of roughly 1 million that provides stormwater services to the majority of the County's area, including all unincorporated areas.

The service area coverage of the surveyed communities ranged anywhere from approximately 281 square miles to 497 square miles. The service area of Fairfax County falls within this range at approximately 378 square miles (this is minus Herndon and Vienna). However, in terms of density (population per square mile of service area) the range of surveyed communities is between 636 people per square mile to over 1940 per square mile. Fairfax is more densely populated than any of the surveyed communities with over 2,600 people per square mile. In addition, all of the communities surveyed noted land features or topographic characteristics similar to those of Fairfax County, including "piedmont," "coastal," and "riverine" topography and land features. Also, as the communities surveyed were all east of the Mississippi River, annual rainfall characteristics proved relatively similar. Annual precipitation for the studied communities ranged between 43.1 and 54 inches per year. Fairfax County averages approximately 44 inches per year.

Land use patterns were very diverse among the surveyed communities with residential properties accounting for anywhere from 20% to 58% of total land use. Approximately 51% of Fairfax County land area is dedicated to residential use.

b. PROGRAM DATA

Each of the jurisdictions surveyed provide some level of stormwater planning, maintenance, regulatory compliance and capital improvement services to their citizenry. The following table identifies the number of respondents that stated that they provide the specific type of service listed as part of their stormwater management program:



Table II-4 Types of Services Provided

Services	No. of Respondents Providing This Type of Service	Notes	Fairfax County Provides this Service
Watershed Planning	5	6 of 8 responded	Yes
Water Quality Monitoring	7	7 of 8 responded	Yes
Inspection of Public Facilities	7	7 of 8 responded	Yes
Inspection of Private Facilities	2	7 of 8 responded	Yes
Maintenance of Public Drainage System	5	6 of 8 responded	Yes
Maintenance of Public Facilities	7	7 of 8 responded	Yes
Maintenance of Private Facilities	1	7 of 8 responded	No
NPDES Compliance	7	7 of 8 responded	Yes
GIS-Based Physical Assets Inventory	7	7 of 8 responded, 1 noted they are partially responsible for this service	Yes
Erosion & Sediment Control	8	8 of 8 responded	Yes
Floodplain Management	8	8 of 8 responded	Yes
Public Education Program	6	6 of 8 responded	Yes
TMDL Program	4	5 of 8 responded	Yes
Development Plan Review	7	7 of 8 responded	Yes
GASB 34 Valuation	5	6 of 8 responded, 1 noted they are partially responsible for this service; 1 ongoing	Yes
Capital Project Management	7	8 of 8 responded	Yes
Capital Project Design	7	8 of 8 responded	Yes
Capital Project Inspection	6	6 of 7 responded	Yes
Dam Safety Program	4	7 of 8 responded	Yes

c. PHYSICAL SYSTEM DATA

Each of the jurisdictions polled for this survey manage a unique physical stormwater management system. Some deal with more closed pipe systems, others with more open channels and ditch systems, usually depending on topography and historical land development patterns. Summaries of information on the various physical components for each community are included in Appendix I.

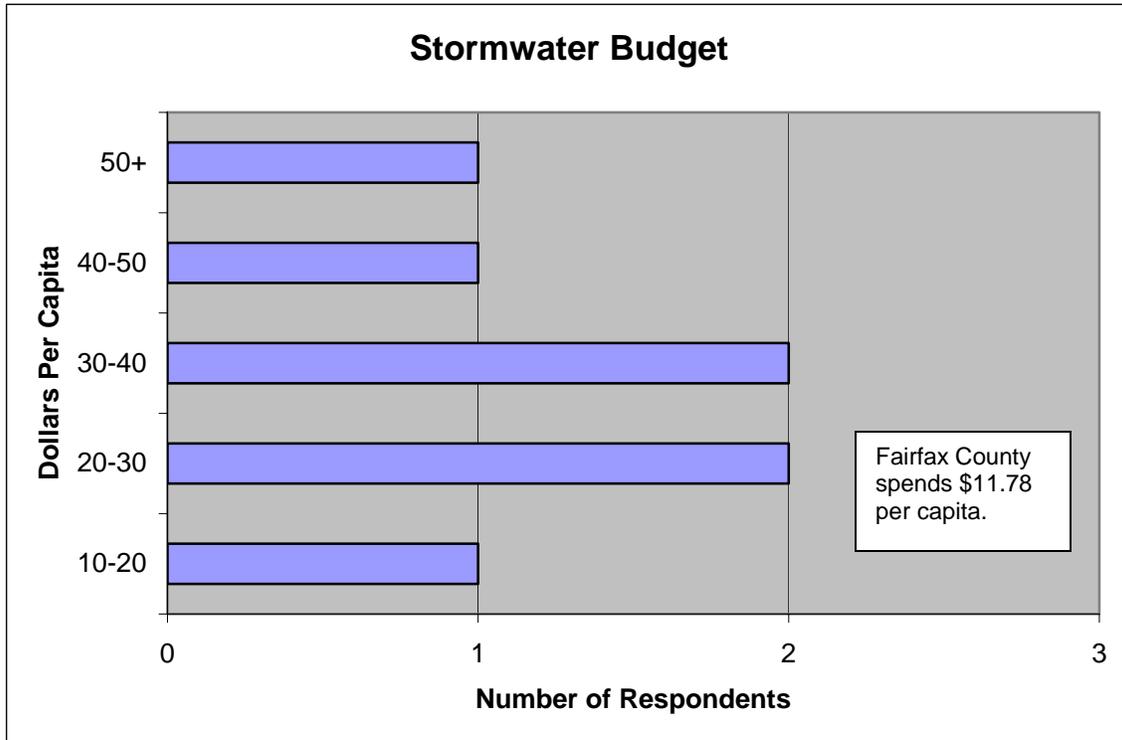
d. FUNDING AND BUDGET DATA

The level of service provided for physical infrastructure maintenance, stormwater management planning, regulatory compliance, and capital construction and improvement programs in each of the surveyed jurisdictions can be traced directly to the amount each community budgets for stormwater-related service and the availability of funding to provide those budgeted dollars.





An examination of the stormwater data gathered for the survey shows that the total annual budgets for these various stormwater programs range from roughly \$4 million to \$35 million (based on 2004 budgets). In comparison, Fairfax County's 2004 costs for stormwater services totaled about \$11.7 million. Using a per capita dollar measurement, the surveyed communities' stormwater budgets ranged from \$13.88 per capita to \$50.00 per capita. Fairfax County is currently spending about \$11.78 per capita on stormwater services. The following graph shows the number of survey respondents and their per capita range.



In order to identify what the surveyed communities' level of service was for the key elements of their programs, budgets were broken down and assigned to five (5) program elements – Engineering & Planning, Regulatory Compliance, Operations & Maintenance, Capital Improvements and Other (includes such elements as emergency response, customer service, debt service, etc). The following table estimates the percentage that each of the surveyed communities budgeted to these program elements in 2004.



Table II-5 Percentage of Total Budget Allocated to Each Element by Community

Program Element	1	2	3	4	5	6	7	8	Fairfax
Engineering & Planning	7.4	30	No data	30.5	11.2	32.6	2	41.4	30
Regulatory Compliance	1.1	30	No data	8	5.6	31.4	3	8.6	8.5
Operation & Maintenance	37.7	29	No data	34.4	65.4	22	48	50	34.2
Capital Improvements	36	11	No data	26.7	14	0	24	0	15.4
Other	17.8	0	No data	7.6	3.8	14	23	0	11.9

Additional information on budgets and funding sources on benchmark communities can be found in Appendix I.

E. GAPS, ISSUES, AND NEEDS

1. ORGANIZING THE PROBLEMS, NEEDS, AND ISSUES

Using the same general functional organization for the Fairfax County stormwater program as shown on Table II-1, the program has been divided into eight (8) functional areas for organizing the identified gaps and issues in the current stormwater program.

In evaluating the current program, identifying opportunities for improvement, and documenting problems, needs and issues, some will naturally fall under one of the functional service categories. For example, a drainage system inspection falls under the functional category of "Operations and Maintenance". Many of the problems, needs and issues discussed can be placed under individual headings while others might be divided among two or more categories.

2. KEY STORMWATER PROGRAM ISSUES

a. ADMINISTRATION & MANAGEMENT

- Currently, professional contracts, for such services as watershed studies and pond design, are managed by engineering staff, creating inefficient use of these technical resources. To help consolidate and streamline the management process, an administrative contract manager, assigned tasks related to contract negotiation, invoice review, contract compliance, etc. will relieve other staff, providing increased attention to project management and will consolidate administrative function of contract oversight, providing consistent management of the process.
- More efficient tracking and reporting would help alleviate some of the effort required to prepare budgets and track costs. This effort can be tied to an



improved database management system identified under “Special Programs” below.

- The existing work order system requires repeated handling of information and inefficient tracking. A new, more robust work order system, integrated into the GIS/inventory system and emergency response systems, would increase efficiency and allow better tracking and evaluation of services and needs. This system will be most useful when fully integrated into GIS, allowing for access by planners, operational manager, program managers, and key leadership. It can be effective in dispatching crews during emergency conditions, in analysis of system conditions by providing assessment on potential system failures, and in allowing a more proactive approach to system management.

b. SPECIAL PROGRAMS

- The County is actively pursuing citizen input on their Watershed Planning work, but there needs to be a more comprehensive stormwater education program in Fairfax. (See Chapter VI - Communication Plan Summary for additional information). Helping the community understand the “cause and effect” of behaviors in their control, the need for preventative maintenance, and the methods to communicate with technical staff (i.e., through a focused website) are important goals of an enhanced communications program.
- The inventory of stormwater facilities is being well documented through inspections and integration into the GIS system, however the update to the SPS study on physical stream assessments (physically walking and inspecting the streams) is not being done due to competing priorities. The stream assessments need to be updated and documented in a similar fashion. Both datasets must be maintained to ensure that the initial investment is not lost and that the data remains useful and effective in management of the drainage and stormwater systems.
- Potential opportunities exist to expand cooperative agreements in support of encouraging proper operation and maintenance of BMPs. Setting up a grant or cost-share program to support retrofits of existing private stormwater facilities and to encourage installation of innovative BMPs will assist property owners with potentially costly repairs, while improving overall system performance.

c. BILLING & FINANCE

- An enhanced stormwater program will require professional financial management to ensure funds and expenditures are tracked and reported completely and accurately.

d. WATERSHED MANAGEMENT PLANNING

- The County continues to undertake its watershed plan development with six (6) watersheds underway and three (3) more scheduled to get underway in FY '05. The goal is to have all the studies completed by 2010. The recommendations from these initial studies are now available and resources must be set aside to start addressing the priority projects in each area. The workload required to manage these studies, maintain useful models and databases and to begin capital improvements implementation, while meeting this schedule, requires additional resources. Planning is a critical foundation to long-term performance of the drainage and stormwater management system. The County is committed to investing resources to ensure that the correct strategies, valued by the community,



are put in place to provide a sustainable quality of life. These Plans must be managed, updated and implemented on a consistent basis. Resources to ensure that the current investment is not lost or eroded are important for the future management of the overall system.

- The County has several long-term planning activities underway including Watershed Plans, source tracking for TMDL identification, Chesapeake Bay 2000 commitments, NPDES five (5) year compliance schedule, BMP effectiveness, model updates, and system monitoring programs. These activities generate significant datasets that can be more valuable when integrated. This data needs to be coordinated through one entity to ensure integration and consistency with program goals and sufficient resources need to be ear-marked to meet schedules and regulatory commitments. A database system that is GIS-linked, menu-driven, allowing for easy search and analysis will enhance the functionality of the individual dataset and allow ease of tracking, reporting, monitoring, etc.
- Erosion and degraded streams have been identified as major problems in the County as addressed in the Stream Physical Assessment and Stream Protection Strategy Reports. The County goal is to continue monitoring selected streams, require enhanced stormwater controls, and identify and implement stream restoration projects. Enhancement in funding is needed to keep ahead of the issue of stream degradation. Monitoring of stream health and stream conditions is an important component of system planning and should be continued with increased resources.
- Additional flow and stream condition monitoring would help assess water quantity and stream flow issues. Increased placement of stream gauges to provide automated data at dams would help identify problem areas. This supports planning and general maintenance efforts, contributing to a more effective analysis on potential system failures.
- The workload demand to keep up with new BMP designs, Low Impact Development (LID) techniques, and other innovative approaches has resulted in a backlog of work related to providing updated design standards, guidance on appropriate implementation, and assessment of efficiencies of these various techniques. A short-term increase in resources in this area would allow backlog to be handled and would provide more timely guidance to the development community.
- Review of rezoning for compliance with Zoning and Subdivision ordinances requires a significant amount of DWPEs staff time. In order to keep up with the demand and respond to the applicants in a timely manner, additional resources are needed.

e. ENGINEERING AND DESIGN

- Existing Stormwater System - Basically all maintenance resources go to immediate (public safety) problems, leaving little support for needed retrofits. Older ponds or those with potential dam embankment problems get first priority, as appropriate. There is also no infrastructure replacement program in place to proactively address an aging storm drainage conveyance and stormwater management facility system. Taking care of high risk sites is a reactive approach to managing the total storm drainage and stormwater management system. In a proactive program, minor problems can be addressed before they expand to high risk failures or potential failures. As the infrastructure continues to age, more major rehabilitation of the total system will be needed. Additional resources are



needed to keep up with the design, construction, and oversight of these rehabilitation projects.

- The County currently administers a dam safety program for a number of PL-566 dams in the Pohick Creek Watershed and another 10 regional detention facilities were recently added to the list. A program is being developed to ensure compliance with the State's Dam Safety Regulations, but Fairfax doesn't yet have a complete count of the number of facilities that will ultimately fall under this program. Resources are needed to compile a complete inventory and assessment and then to perform appropriate repairs or upgrades.
- In addition to the need for facility retrofits and conveyance system rehabilitation, the County has a large backlog of new capital projects and area retrofits with an estimated dollar value between \$340 million (known backlog) and \$800 million (estimated county-wide need). This estimate will be refined as additional Watershed Plans are completed over the next 6 years. For the past several fiscal years the County budgeted about \$2 to \$3M a year on capital improvements, which is not keeping up with demands to address known problems. In order to address major stormwater improvements that are known problems and to implement the capital needs identified in the Watershed Plans, the County will need to increase capital funds and add staff to manage this increase in capital work.

e. OPERATIONS & MAINTENANCE

- The County is doing the inspections of private stormwater management facilities, but has limited enforcement authority to force maintenance of these systems. Existing agreements have general maintenance standards but do not specific performance requirements. Also, a significant amount of these facilities have no maintenance agreements in place. Decisions need to be made on ways to increase enforcement capabilities to ensure that maintenance occurs.
- The current level of service is to inspect each segment of the public drainage system every 5 years. Much of the system is reaching the end of its design life, requiring an increase in frequency of inspection. Increasing inspections to at least once every three years will prevent some failures and will maintain functional facilities. As new regulations include innovative BMPs and LIDs, additional demand for inspections will occur, increasing the existing workload of inspectors, requiring additional resources to keep up with the workload.
- On the public stormwater management system, work orders were required on more than 20% of over 1,000 facilities in 2003. This only included work of a critical nature and did not necessarily bring facility functionality back up to design standards. The performance goal is to ensure that each facility functions properly as designed and causes zero erosion. This standard is not being fully met. In order to accomplish this goal, additional resources are needed.
- There is no maintenance program for stream "spot" improvements and erosion control. Work in streams is limited to removing blockages that cause house and roadway flooding. A stream maintenance program is needed to address the smaller severe erosion problems and "spot" stream improvements to minimize property damage caused by stream erosion and widening.
- Mowing and channel cleaning of the public facilities is now limited, due to resource restrictions, to once per year. This is not considered sufficient to properly maintain the areas and the frequency should be increased to at least twice per year as a consistent performance standard for the level of service for mowing and cleaning.



- As additional dams are added to the list of facilities requiring County inspection and maintenance, additional resources are needed for mowing, vegetative control, rehabilitation, and inspection. It is estimated that each facility requires an annual maintenance cost of \$15,000. This service is contracted to the private sector. Additional staff time should be dedicated to managing this program to ensure that contractor performance is effective.
- MSMD now has over 1400 miles of storm sewer and 800 miles of stream to maintain. 20% of the storm system is inspected yearly. Much of the existing storm system is approaching 50 years old and is in need of rehabilitation and increased impervious area in the County is resulting in increased stream erosion. In order to keep up with these problems, increasing the frequency of inspections and significant investment in maintaining the existing system is required. Also, increased video monitoring of the system would improve assessing and tracking maintenance needs.
- Initial response to citizen's complaints is good, but work order completion is taking longer than desired. With over 1,600 documented complaints per year, those issues that are maintenance in nature (blockages) and/or are safety issues (cave-ins or broken manhole covers) are dealt with swiftly (usually within 25 days), but those that require development of storm drainage improvements take much longer to address. There is a substantial backlog of Priority 2 and 3 repairs that can take as long as six months to complete when the issue can be addressed. For many, work is never undertaken to address the problem. Additional resources are needed to deal with this backlog. This will be supported through an enhanced work-order and database management system described under the functional categories of Special Programs and Administration. These tools will enable the County to be more effective in supporting the reduction of this backlog. However, only an increase in funding for remedial and capital improvements will create a proactive management approach to system maintenance.
- The County uses data from the GIS system to provide GASB 34 information, but there does not appear to be a process to add and track new development information on structures and conveyance system. Adding this information to a new tracking system, as identified above, would improve information access and help with the valuation of assets.

f. PLAN REVIEW AND EROSION CONTROL

- Under the federal Clean Water Act, TMDLs (Total Maximum Daily Loads) must be developed to determine the sources of stream impairment and to allocate needed reductions. Fecal coliform bacteria TMDLs have already been developed for Accotink Creek and Four Mile Run, with the remaining TMDLs scheduled to be developed between 2006 and 2014. It is likely that additional stream segments will be added to the impaired waters list when DEQ performs its biannual update in 2004. While the actual TMDLs will be developed by DEQ in cooperation with the County, subsequent TMDL Implementation Plans will require specific actions by the County. While most County stream impairments are currently caused by violations of fecal coliform standards, at least three watersheds (Mills Branch, Popes Head Creek, and Accotink Creek) are on the impaired waters list because of impaired aquatic ecosystems – which can have multiple causes (sediment, temperature, turbidity, toxics, etc.). It is anticipated that significant additional demands will be placed on County staff as more TMDLs and TMDL Implementation Plans are developed and integrated into the County's VPDES permit.





- The draft Shenandoah and Potomac Basins Tributary Strategy, released in April 2004 to implement the nutrient and sediment reduction goals of the 2000 Chesapeake Bay Agreement, relies heavily on urban BMPs. In the Potomac basin alone, the draft Tributary Strategy includes 187,000 acres of urban nutrient management and 71,000 acres of urban retrofit with bioretention facilities, swales, and other innovative BMP practices. These urban BMPs are expected to cost \$240 million through 2010. While the Tributary Strategy is technically voluntary, failure to meet target nutrient and sediment reductions has the potential to result in the imposition of a Chesapeake Bay-wide TMDL. This would effectively supplant the voluntary Chesapeake Bay Program and make implementation mandatory through the County's VPDES permit.
- To ensure local erosion control is meeting County standards, a more robust system is required. Additional resources are needed to meet the challenge of minimizing increased sediment and erosion concerns.
- The County has stormwater regulations but does not have a Stormwater Ordinance. Development of such an ordinance would allow standardized enforcement authorities and other stormwater related activities. The need for such an ordinance should be evaluated at the same time that the funding option is being considered, as a decision to go to a stormwater utility would result in the need for a rate ordinance. This is an opportunity to combine an ordinance for stormwater management with a funding/rate ordinance, which is often done when a utility is established.

g. CONSTRUCTION SERVICES

- Managing an enhanced approved capital program will require professional staff following a streamlined implementation process. Additional resources identified under Watershed Planning (above) are necessary to ensure that an effective capital reinvestment strategy can be accomplished in a timely manner. This is critically important to ensure that public confidence is sustained for the operation of the stormwater program.
- As the County starts to increase spending on capital improvements over the next few years, additional construction inspection staff will be required to ensure that projects are kept on schedule and built according to plans and specifications.



CHAPTER III

PROPOSED LEVEL OF SERVICE

A. CHAPTER SUMMARY

The following sections include a discussion of the options that the County has related to the continued level of service that their stormwater program will provide and outlines a proposed increased level of service to meet the current and future needs of Fairfax County.

Three levels of service options were considered in the evaluation of the stormwater management program in Fairfax County. These options include maintaining the status quo, implementing a comprehensive program through expanded resources over the next 10 years, and increasing capital improvements construction with minimal increases in maintenance and planning to support the new improvements program. Based on the review of the current services, with input from staff and through comparison of Fairfax County to other communities, it is recommended that Fairfax County initiate the process of developing a comprehensive stormwater program, phased in over time in a logical, building block approach. This will put Fairfax County on a path to achieve regulatory mandates for water quality protection, to achieve goals identified in the 2003 Strategic Plan, to sustain the viability of the existing investment in infrastructure, and to achieve the goals established through the Watershed Plan initiative underway.

Development of a comprehensive stormwater program includes initiatives in program management, planning, infrastructure maintenance, enforcement of performance standards, capital construction and regulatory controls. Highlights of Key Level of Service Initiatives:

- Implement capital improvement projects (backlog estimated between \$340 million to \$800 million) over the next 20 to 40 years. These projects will position the County for regulatory compliance and facilitate restoration of the County's streams, 70% of which are in fair to very poor condition.
- Upgrade, within the next 10 years, all public stormwater management facilities so that they function properly. This includes management of the program for major pond rehabilitation projects.
- Implement an enhanced enforcement capability to ensure private facilities are operating as designed.
- Increase public education activity to meet regulatory compliance and to increase public understanding of the goals and activities within the overall program, as well as engage them in participating in stormwater program activities.
- Update and maintain watershed plans on a regular basis to manage capital improvement prioritization.
- Organize the Watershed Planning process by dividing the planning area into quadrants to improve efficiency and effectiveness in overall planning capability. This will support implementation of each Plan's recommendations and meet the schedule to have all studies complete by 2010.



The cost of change has been evaluated under two scenarios. The first is to build an optimal program as quickly as possible and the second is a more moderate growth in new resources, targeting capital improvements and maintenance enhancements. Both program cost models were projected over a five-year planning period. The second scenario, the more moderate growth profile, is recommended as the approach the County should take in expanding the level of service for stormwater. The following table provides a summary of the five-year cost estimate, combining current program costs with projected program enhancements. Full details are found in Table III-2 for the Optimal Approach and Table III-3 for the Recommended Approach. This moderate growth program would increase the level of service from \$11.7 million (in FY' 04) to \$28 million in FY'06.

Table III-1 Summary of Cost Projection for Recommended Level of Service

Cost Summary-Moderate	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Total	Percent
Administration	\$ 1,232,260	\$ 1,266,228	\$ 1,301,215	\$ 1,237,251	\$ 1,274,369	\$ 6,311,322	3.1%
Special Programs	\$ 704,000	\$ 663,470	\$ 674,254	\$ 685,362	\$ 696,803	\$ 3,423,888	1.7%
Billing and Finance	\$ 1,992,000	\$ 1,997,760	\$ 2,003,693	\$ 2,009,804	\$ 2,016,098	\$ 10,019,354	5.0%
Planning and Engineering	\$ 3,830,000	\$ 4,137,250	\$ 4,337,664	\$ 4,631,243	\$ 4,753,381	\$ 21,689,538	10.8%
Operations and Maintenance	\$ 4,805,000	\$ 5,485,700	\$ 6,466,031	\$ 7,239,403	\$ 7,883,136	\$ 31,879,270	15.9%
Retrofits/Conveyance Rehab	\$ 5,400,000	\$ 9,800,000	\$ 9,900,000	\$ 9,900,000	\$ 12,400,000	\$ 47,400,000	23.6%
Plan Review and Erosion Control	\$ 1,105,000	\$ 1,138,150	\$ 1,232,441	\$ 1,269,414	\$ 1,307,496	\$ 6,052,500	3.0%
Capital Improvements	\$ 9,040,000	\$ 12,480,000	\$ 15,480,000	\$ 15,480,000	\$ 21,740,000	\$ 74,220,000	36.9%
Total Projected Costs	\$ 28,108,260	\$ 36,968,558	\$ 41,395,297	\$ 42,452,477	\$ 52,071,281	\$ 200,995,873	100.0%

B. OPTIONS

1. MAINTAINING THE STATUS QUO

Currently the County provides a basic and/or minimal level of service in several key stormwater management areas including maintenance, regulatory compliance, infrastructure inspection, watershed planning, and capital improvements. As noted in the previous section, the current level of service provides for regular inspection of stormwater facilities and the storm sewer system, maintenance of high priority – high risk problems, on-call emergency response, continued watershed planning, basic regulatory compliance, plan review, complaint response, and extremely minimal capital improvements. Continuing with the status quo will provide the community with the most basic, minimal services on a reactive schedule. Some of the indirect costs associated with the decision to continue to operate at this level of service include:

- A deteriorating infrastructure, resulting in higher annual system failures, higher yearly maintenance costs and long-term increased capital replacement costs;
- Non-functioning or inadequately functioning facilities, negatively impacting water quality and water quantity control and potentially increasing risk to public safety;



- Inability to fund the stormwater improvements currently being identified through the watershed planning studies, resulting in community disappointment after having worked with the County staff, in good faith, to identify watershed needs and establish priorities;
- Eventual non-compliance with regulatory requirements that mandate properly functioning BMPs, that specify inventory updates, system monitoring and reporting requirements, that require compliance with Total Maximum Daily Load restrictions; and that require expanded public outreach and education;
- Slower responses to citizen's calls and complaints on stormwater issues; and
- Increased liability for potential failure of dams or other facilities that could result in flood damage to property and threats to public safety.

The cost of operating the stormwater management program and drainage system will not get cheaper, less expensive, and less costly. Moving to a more preventative program will reduce operating costs over time.

2. IMPLEMENTING AN ENHANCED LEVEL OF SERVICE

Based on review of existing County documents, discussions with County staff, and comparison with other similar stormwater programs in the Eastern United States, the County will need to enhance their current stormwater program in order to achieve the goals and outcomes defined in protection strategies, both regulatory and voluntary, in the 2003 Strategic Plan, and in the County's Environmental Agenda. Without a change in program strategies the County will be unable to achieve long-term performance of the stormwater management and drainage system. The County should provide the public with a program that protects their investment in the community and in the existing stormwater infrastructure, and to minimize the liability of the County for any system failures. The minimal investment in capital improvements and maintenance rehabilitation and retrofits will result in increased infrastructure failures and more costly maintenance.

The improvements in the level of service need not happen all in one year. In fact, adding services in a planned way with the overall goal of having a comprehensive program in place within the next 5 to 10 years is a more manageable and effective way to build a solid program. By prioritizing the needs and estimating the investment needed to meet these needs on an annual basis, the County can build a stepped approach to full implementation of a stormwater program that will shift over time to a more proactive, responsive service to the community. The following section outlines what elements the enhanced program would include. This information is then placed into two proposed 5-year plans to show potential options for building the program and to show the potential costs for using this approach.

3. INCREASE IN CAPITAL IMPROVEMENTS CONSTRUCTION PROGRAM WITH MINIMAL INCREASE IN PLANNING AND MAINTENANCE SERVICES

Fairfax County's capital improvement construction program backlog is valued between \$340 million (based on identified project needs) to \$800 million (based on projected capital improvements identified through the current update of Watershed Plans). The backlog will increase over time due to ordinary aging of stormwater management



facilities and conveyance systems. One approach to addressing an increased level of service is to maintain the current maintenance and planning services while increasing investment in the capital improvements program through either a dedicated user fee or through increases in local real estate taxes. With this change in the level of service, some new resources will be needed in Stormwater Planning and in Maintenance to address the expanded physical system and to design and construct the new facilities or conveyance system. This will ultimately result in an overall reduced level of service because of the stress placed on already limited internal staff resources and will not contribute to solving or addressing water quality regulatory challenges or mandates that are not capital related.

This will honor the current watershed planning initiative by investing in capital improvements identified and prioritized with citizen input. This may be one approach to a long-term commitment to achieving a comprehensive stormwater program, but only if, at some time in the future, levels of service in all areas of stormwater program management receive the support necessary to achieve long-term goals defined in the Strategic Plan for the County.

C. PRELIMINARY PROGRAM RECOMMENDATIONS

In addition to continuing with the current services now provided by the County, the following additional elements have been identified as steps needed in the implementation of a long-term successful stormwater management program.

1. ADMINISTRATION

- Develop and integrate a new, robust work order system. This will include hardware, software, and training to ensure maximum efficiency of the system.
- Expand contract management capabilities by consolidating many of these services under an administrative contracts manager.
- Establish a section for administration of the stormwater utility, if this funding option is pursued.

2. SPECIAL PROGRAMS

- Increase public education activity to meet regulatory compliance and to increase public understanding of the goals and activities within the overall program, as well as engage them in participating in stormwater program activities.
- Obtain new data application software to allow tracking of multiple, integrated stormwater activities such as BMP installation, site inspection results, enforcement activities, and mitigation opportunities. Build a database management tool to increase staff efficiencies in serving the public and in improving stormwater system performance.
- Update and maintain watershed plans, hydraulic/hydrologic models, and capital improvement prioritization.
- Update and maintain the GIS impervious data layer.
- Update and maintain physical stream assessment inventory and related maintenance activities.
- Set-up a grant or cost-share program to retrofit existing private stormwater facilities and to encourage installation of innovative BMPs.



3. WATERSHED PLANNING AND ENGINEERING

- Organize the Watershed Planning process by dividing the planning area into quadrants to improve efficiency and effectiveness in overall planning capability. This will support implementation of each Plan's recommendations and meet the schedule to have all studies complete by 2010.
- Improve effectiveness in review of rezoning cases.
- Update and/or develop new BMP design standards. Once the update is complete, increase level of service to ensure standards are updated in a timely manner.
- Increase use of stream gauges to enhance data collection to support water quality protection program, sediment transport reduction and flood protection activities.
- Complete upgrades or retrofits to recently regional or State designated PL-566 dams and complete design, construction and oversight of backlog of other facility retrofits.
- Support increase in funding for capital improvement (i.e. design, inspection and contract management/project management).

4. OPERATIONS AND MAINTENANCE

- Perform mowing and routine maintenance of facilities twice per year (increase from current level of service of once per year).
- Upgrade, within the next 10 years, all public stormwater management facilities so that they function properly. This includes management of the program for major pond rehabilitation projects.
- Implement a new dam safety program, including inspection and maintenance activities. Include vegetative management services at these facilities.
- Implement an enhanced enforcement capability to ensure private facilities are operating as designed.
- Increase frequency of the inspection of the storm sewer system.
- Expand capability to perform storm sewer system upgrades and replacements.
- Expand maintenance services to include inspection of and additional work orders on both public and private facilities that will be necessary as new BMPs (LIDs, innovative techniques) are installed.
- Reduce incidence of erosion through new stream "spot" improvements program and erosion control measures.

5. CAPITAL CONSTRUCTION

- Implement capital improvement projects (backlog estimated between \$340 million to \$800 million) over the next 20 to 40 years. These projects will position the County for regulatory compliance and facilitate restoration of the County's streams, 70% of which are in fair to very poor condition.
- Ensure capability of construction inspection and right-of-way acquisition services needed as a result of increase in capital spending.

D. PRELIMINARY PROGRAM COSTS

The enhancements identified above have been evaluated to determine the potential cost impacts to the County to initiate effort to achieve a comprehensive stormwater program over the next 5 to 10 years. Two cost projections are provided.





Table III-2 addresses the program objectives and continues current services at the level budgeted in 2004, with most enhancements initiated in FY 2006.

The second projection, Table III-3, is a more moderate approach, building the overall program to an optimal level in Year 2010, with the expansion of services more slowly than in the first projection.

It is noted that the existing budget for current services, in each Cost Model, was projected over the five-year period by using a three (3) percent escalator. Billing costs for a utility are projected using costs for a third party billing agent to manage the process.



Table III – 2

Fairfax County Comprehensive Stormwater Program - Optimal						
Cost Projections for FY 2006 through FY 2010						
Program Element	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Total
Administration and Management						
Workorder System	\$ 100,000	\$ 100,000	\$ 100,000			\$ 300,000
Contract Process Management	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 318,548
<i>Subtotal Enhancements</i>	\$ 160,000	\$ 161,800	\$ 163,654	\$ 65,564	\$ 67,531	\$ 618,548
Existing Annualized Costs	\$ 1,072,260	\$ 1,104,428	\$ 1,137,561	\$ 1,171,687	\$ 1,206,838	\$ 5,692,774
<i>Cost Center Total</i>	\$ 1,232,260	\$ 1,266,228	\$ 1,301,215	\$ 1,237,251	\$ 1,274,369	\$ 6,311,322
Special Programs						
Support for Regional Initiatives	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000	\$ 375,000
GIS-Database Management	\$ 60,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 120,000
Management of Digital Model/Database	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 318,548
Stream Assessment and Inventory Program	\$ 55,000	\$ 56,650	\$ 58,350	\$ 60,100	\$ 61,903	\$ 292,002
BMP Retrofit Grant Program	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 500,000
Communications Plan Implementation						
Microsite Development/Maintenance	\$ 10,000	\$ 4,000	\$ 4,000	\$ 4,000	\$ 4,000	\$ 26,000
Video Production and Brochures	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 500,000
Staff	\$ 55,000	\$ 56,650	\$ 58,350	\$ 60,100	\$ 61,903	\$ 292,002
Materials	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 50,000
<i>Subtotal Enhancements</i>	\$ 525,000	\$ 479,100	\$ 484,353	\$ 489,764	\$ 495,336	\$ 2,473,553
Existing Annualized Costs	\$ 179,000	\$ 184,370	\$ 189,901	\$ 195,598	\$ 201,466	\$ 950,335
<i>Cost Center Total</i>	\$ 704,000	\$ 663,470	\$ 674,254	\$ 685,362	\$ 696,803	\$ 3,423,888
Billing and Finance						
Master Account File Management	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 318,548
Bill Production/Accounting/Collection	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 9,000,000
<i>Subtotal Enhancements</i>	\$ 1,860,000	\$ 1,861,800	\$ 1,863,654	\$ 1,865,564	\$ 1,867,531	\$ 9,318,548
Existing Annualized Costs	\$ 132,000	\$ 135,960	\$ 140,039	\$ 144,240	\$ 148,567	\$ 700,806
<i>Cost Center Total</i>	\$ 1,992,000	\$ 1,997,760	\$ 2,003,693	\$ 2,009,804	\$ 2,016,098	\$ 10,019,354
Planning and Engineering (combined)						
Design and Project Management	\$ 125,000	\$ 250,000	\$ 325,000	\$ 500,000	\$ 500,000	\$ 1,700,000
BMP Standards Update	\$ 100,000	\$ 100,000	\$ 40,000	\$ 41,200	\$ 42,436	\$ 323,636
Planning and Zoning Support	\$ 60,000	\$ 61,800	\$ 121,800	\$ 125,454	\$ 129,218	\$ 498,272
Emergency Response/Monitoring Support	\$ 30,000	\$ 45,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 255,000
Dam Safety Program Management		\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 251,018
<i>Subtotal Enhancements</i>	\$ 315,000	\$ 516,800	\$ 608,600	\$ 790,308	\$ 797,217	\$ 3,027,925
Existing Annualized Costs	\$ 3,515,000	\$ 3,620,450	\$ 3,729,064	\$ 3,840,935	\$ 3,956,163	\$ 18,661,612
<i>Cost Center Total</i>	\$ 3,830,000	\$ 4,137,250	\$ 4,337,664	\$ 4,631,243	\$ 4,753,381	\$ 21,689,538
Operations and Maintenance						
Contract Mowing Program		\$ 175,000	\$ 175,000	\$ 225,000	\$ 225,000	\$ 800,000
In-house Mowing Program			\$ 240,000	\$ 247,200	\$ 254,616	\$ 741,816
Retrofit Program Management	\$ 55,000	\$ 56,650	\$ 58,350	\$ 60,100	\$ 61,903	\$ 292,002
Public WQ Facilities Maintenance	\$ 1,145,000	\$ 1,145,000	\$ 1,225,000	\$ 1,345,000	\$ 1,345,000	\$ 6,205,000
Conveyance System Maintenance		\$ 253,000	\$ 510,000	\$ 775,000	\$ 798,250	\$ 2,336,250
Inspection Program						
Facilities Inspection		\$ 60,000	\$ 61,800	\$ 123,800	\$ 127,514	\$ 373,114
LID Inspection (private facilities)	\$ 120,000	\$ 240,000	\$ 360,000	\$ 480,000	\$ 600,000	\$ 1,800,000
<i>Subtotal Enhancements</i>	\$ 1,320,000	\$ 1,929,650	\$ 2,630,150	\$ 3,256,100	\$ 3,412,283	\$ 12,548,182
Existing Annualized Costs	\$ 4,025,000	\$ 4,145,750	\$ 4,270,123	\$ 4,398,226	\$ 4,530,173	\$ 21,369,272
<i>Cost Center Total</i>	\$ 5,345,000	\$ 6,075,400	\$ 6,900,272	\$ 7,654,326	\$ 7,942,456	\$ 33,917,454
Plan Review and Erosion Control						
Enhanced E&S Inspection Program	\$ 60,000	\$ 61,800	\$ 123,800	\$ 127,514	\$ 131,339	\$ 504,453
<i>Subtotal Enhancements</i>	\$ 60,000	\$ 61,800	\$ 123,800	\$ 127,514	\$ 131,339	\$ 504,453
Existing Annualized Costs	\$ 1,045,000	\$ 1,076,350	\$ 1,108,641	\$ 1,141,900	\$ 1,176,157	\$ 5,548,047
<i>Cost Center Total</i>	\$ 1,105,000	\$ 1,138,150	\$ 1,232,441	\$ 1,269,414	\$ 1,307,496	\$ 6,052,500
Capital Construction						
Maintenance Capital Improvements						
SW Management Facility Rehabilitation	\$ 7,200,000	\$ 2,400,000	\$ 2,400,000	\$ 2,400,000	\$ 2,400,000	\$ 16,800,000
Conveyance System Rehabilitation	\$ 10,000,000	\$ 10,000,000	\$ 10,000,000	\$ 10,000,000	\$ 10,000,000	\$ 50,000,000
Capital Improvements	\$ 10,000,000	\$ 10,000,000	\$ 15,000,000	\$ 15,000,000	\$ 20,000,000	\$ 70,000,000
Design Costs Major	\$ 1,850,000	\$ 1,620,000	\$ 2,120,000	\$ 2,120,000	\$ 2,620,000	\$ 10,330,000
Land Acquisition/ROW	\$ 1,850,000	\$ 1,620,000	\$ 2,120,000	\$ 2,120,000	\$ 2,620,000	\$ 10,330,000
<i>Subtotal Enhancements</i>	\$ 30,900,000	\$ 25,640,000	\$ 31,640,000	\$ 31,640,000	\$ 37,640,000	\$ 157,460,000
Existing Annualized Costs	\$ 2,500,000	\$ 2,500,000	\$ 2,500,000	\$ 2,500,000	\$ 2,500,000	\$ 12,500,000
<i>Cost Center Total</i>	\$ 33,400,000	\$ 28,140,000	\$ 34,140,000	\$ 34,140,000	\$ 40,140,000	\$ 169,960,000
Total Program Improvements	\$ 35,140,000	\$ 30,650,950	\$ 37,514,211	\$ 38,234,813	\$ 44,411,237	\$ 185,951,211
Total Existing Program Costs	\$ 12,468,260	\$ 12,767,308	\$ 13,075,327	\$ 13,392,587	\$ 13,719,364	\$ 65,422,846
Total Stormwater Program Costs	\$ 47,608,260	\$ 43,418,258	\$ 50,589,538	\$ 51,627,400	\$ 58,130,602	\$ 251,374,057
Note:						
Existing annualized costs are rounded up from the Current Cost Allocation Table and inflated at a 3 percent rate.						
Billing costs are set at \$6.00 per account per year based on an estimated 300,000 accounts, assuming a third-party billing system.						



Table III - 3

Fairfax County Comprehensive Stormwater Program - Recommended Approach						
Cost Projections for FY 2006 through FY 2010						
Program Element	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Total
Administration and Management						
Workorder System	\$ 100,000	\$ 100,000	\$ 100,000			\$ 300,000
Contract Process Management	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 318,548
<i>Subtotal Enhancements</i>	\$ 160,000	\$ 161,800	\$ 163,654	\$ 65,564	\$ 67,531	\$ 618,548
Existing Annualized Costs	\$ 1,072,260	\$ 1,104,428	\$ 1,137,561	\$ 1,171,687	\$ 1,206,838	\$ 5,692,774
<i>Cost Center Total</i>	\$ 1,232,260	\$ 1,266,228	\$ 1,301,215	\$ 1,237,251	\$ 1,274,369	\$ 6,311,322
Special Programs						
Support for Regional Initiatives	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000	\$ 375,000
GIS-Database Management	\$ 60,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 120,000
Management of Digital Model/Database	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 318,548
Stream Assessment and Inventory Program	\$ 55,000	\$ 56,650	\$ 58,350	\$ 60,100	\$ 61,903	\$ 292,002
BMP Retrofit Grant Program	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 500,000
Communications Plan Implementation						
Microsite Development/Maintenance	\$ 10,000	\$ 4,000	\$ 4,000	\$ 4,000	\$ 4,000	\$ 26,000
Video Production and Brochures	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 500,000
Staff	\$ 55,000	\$ 56,650	\$ 58,350	\$ 60,100	\$ 61,903	\$ 292,002
Materials	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 50,000
<i>Subtotal Enhancements</i>	\$ 525,000	\$ 479,100	\$ 484,353	\$ 489,764	\$ 495,336	\$ 2,473,553
Existing Annualized Costs	\$ 179,000	\$ 184,370	\$ 189,901	\$ 195,598	\$ 201,466	\$ 950,335
<i>Cost Center Total</i>	\$ 704,000	\$ 663,470	\$ 674,254	\$ 685,362	\$ 696,803	\$ 3,423,888
Billing and Finance						
Master Account File Management	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 318,548
Bill Production/Accounting/Collection	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 9,000,000
<i>Subtotal Enhancements</i>	\$ 1,860,000	\$ 1,861,800	\$ 1,863,654	\$ 1,865,564	\$ 1,867,531	\$ 9,318,548
Existing Annualized Costs	\$ 132,000	\$ 135,960	\$ 140,039	\$ 144,240	\$ 148,567	\$ 700,806
<i>Cost Center Total</i>	\$ 1,992,000	\$ 1,997,760	\$ 2,003,693	\$ 2,009,804	\$ 2,016,098	\$ 10,019,354
Planning and Engineering (combined)						
Design and Project Management	\$ 125,000	\$ 250,000	\$ 325,000	\$ 500,000	\$ 500,000	\$ 1,700,000
BMP Standards Update	\$ 100,000	\$ 100,000	\$ 40,000	\$ 41,200	\$ 42,436	\$ 323,636
Planning and Zoning Support	\$ 60,000	\$ 61,800	\$ 121,800	\$ 125,454	\$ 129,218	\$ 498,272
Flow/stream condition monitoring	\$ 30,000	\$ 45,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 255,000
Dam Safety Program Management		\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 251,018
<i>Subtotal Enhancements</i>	\$ 315,000	\$ 516,800	\$ 608,600	\$ 790,308	\$ 797,217	\$ 3,027,925
Existing Annualized Costs	\$ 3,515,000	\$ 3,620,450	\$ 3,729,064	\$ 3,840,935	\$ 3,956,163	\$ 18,661,612
<i>Cost Center Total</i>	\$ 3,830,000	\$ 4,137,250	\$ 4,337,664	\$ 4,631,243	\$ 4,753,381	\$ 21,689,538
Operations and Maintenance						
Contract Mowing Program		\$ 175,000	\$ 175,000	\$ 225,000	\$ 225,000	\$ 800,000
In-house Mowing Program			\$ 240,000	\$ 247,200	\$ 254,616	\$ 741,816
Retrofit Program Management	\$ 65,000	\$ 66,950	\$ 68,959	\$ 71,027	\$ 73,158	\$ 345,094
Public WQ Facilities Maintenance	\$ 715,000	\$ 715,000	\$ 1,005,000	\$ 1,130,000	\$ 1,345,000	\$ 4,910,000
Conveyance System Maintenance		\$ 253,000	\$ 510,000	\$ 775,000	\$ 798,250	\$ 2,336,250
Inspection Program						
Facilities Inspection		\$ 65,000	\$ 66,950	\$ 132,950	\$ 136,939	\$ 401,839
LID Inspection (private facilities)		\$ 65,000	\$ 130,000	\$ 260,000	\$ 520,000	\$ 975,000
<i>Subtotal Enhancements</i>	\$ 780,000	\$ 1,339,950	\$ 2,195,909	\$ 2,841,177	\$ 3,352,963	\$ 10,509,998
Existing Annualized Costs	\$ 4,025,000	\$ 4,145,750	\$ 4,270,123	\$ 4,398,226	\$ 4,530,173	\$ 21,369,272
<i>Cost Center Total</i>	\$ 4,805,000	\$ 5,485,700	\$ 6,466,031	\$ 7,239,403	\$ 7,883,136	\$ 31,879,270
Plan Review and Erosion Control						
Enhanced E&S Inspection Program	\$ 60,000	\$ 61,800	\$ 123,800	\$ 127,514	\$ 131,339	\$ 504,453
<i>Subtotal Enhancements</i>	\$ 60,000	\$ 61,800	\$ 123,800	\$ 127,514	\$ 131,339	\$ 504,453
Existing Annualized Costs	\$ 1,045,000	\$ 1,076,350	\$ 1,108,641	\$ 1,141,900	\$ 1,176,157	\$ 5,548,047
<i>Cost Center Total</i>	\$ 1,105,000	\$ 1,138,150	\$ 1,232,441	\$ 1,269,414	\$ 1,307,496	\$ 6,052,500
Capital Construction						
Maintenance Capital Improvements						
SW Management Facility Rehabilitation	\$ 2,400,000	\$ 4,800,000	\$ 2,400,000	\$ 2,400,000	\$ 2,400,000	\$ 14,400,000
Conveyance System Rehabilitation	\$ 3,000,000	\$ 5,000,000	\$ 7,500,000	\$ 7,500,000	\$ 10,000,000	\$ 33,000,000
Capital Improvements	\$ 5,000,000	\$ 7,500,000	\$ 10,000,000	\$ 10,000,000	\$ 15,000,000	\$ 47,500,000
Design Costs Major	\$ 770,000	\$ 1,240,000	\$ 1,490,000	\$ 1,490,000	\$ 2,120,000	\$ 7,110,000
Land Acquisition/ROW	\$ 770,000	\$ 1,240,000	\$ 1,490,000	\$ 1,490,000	\$ 2,120,000	\$ 7,110,000
<i>Subtotal Enhancements</i>	\$ 11,940,000	\$ 19,780,000	\$ 22,880,000	\$ 22,880,000	\$ 31,640,000	\$ 109,120,000
Existing Annualized Costs	\$ 2,500,000	\$ 2,500,000	\$ 2,500,000	\$ 2,500,000	\$ 2,500,000	\$ 12,500,000
<i>Cost Center Total</i>	\$ 14,440,000	\$ 22,280,000	\$ 25,380,000	\$ 25,380,000	\$ 34,140,000	\$ 121,620,000
Total Program Improvements	\$ 15,640,000	\$ 24,201,250	\$ 28,319,970	\$ 29,059,890	\$ 38,351,917	\$ 135,573,026
Total Existing Program Costs	\$ 12,468,260	\$ 12,767,308	\$ 13,075,327	\$ 13,392,587	\$ 13,719,364	\$ 65,422,846
Total Stormwater Program Costs	\$ 28,108,260	\$ 36,968,558	\$ 41,395,297	\$ 42,452,477	\$ 52,071,281	\$ 200,995,873
Note:						
Existing annualized costs are rounded up from the Current Program Cost Allocation table and inflated at 3 percent annual rate.						
Billing costs are projected at \$6.00 per account, per year based on the use of a third-party billing agent.						



CHAPTER IV

FUNDING METHODS AND REVENUE GENERATING CAPACITY

A. CHAPTER SUMMARY

The purpose of this discussion is to examine the funding mechanisms available to Fairfax County to support its stormwater management program. The information is intended for use by the County to help make policy decisions regarding the right mix of funding tools to achieve the County's target level of service. The Chapter helps to highlight issues of funding equity (linking revenue sources with those who place a demand on the County for the service) and funding adequacy (the ability of a potential source to produce sufficient and stable revenue). The Chapter also divides revenue into those with the capacity to fund an entire program (primary sources), and those with the capacity to fund specific program elements (secondary sources).

Primary Funding Methods	Secondary Funding Methods
<ul style="list-style-type: none"> • General Fund Appropriations • Stormwater Service Fees (Stormwater Utility) 	<ul style="list-style-type: none"> • Other Service Fees • Special Assessments • Pro Rata Shares – Capital Projects Only • Watershed Improvement Districts • Federal and State Funding/Grants/Loans • In-Lieu-Of-Construction Fees • General Obligation and Revenue Bonding – Capital Projects Only

While the potential secondary sources of revenue identified above can support specific program elements within the County's stormwater program, there are only two commonly recognized primary funding mechanisms that can create sufficient revenues to support stormwater management in Fairfax. These are the General Fund, supported primarily through the real property tax, and a stormwater utility fee.

Evaluation of the funding tools identifies four levels of service that are directly driven by the funding options available to the County. As a result, after considering how secondary sources can fund specific program elements, the County's major options for stormwater funding include the following:

- Maintain the status quo, utilizing a mix of General Funds and Pro Rata Share.
- Reallocate General Funds from other County services and programs to stormwater management to address increase the level of service recommended in Chapter III.
- Raise real property taxes and dedicate a portion to stormwater management to increase the level of service recommended in Chapter III.



- Implement a dedicated stormwater utility fee, relieving the General Fund, increasing the level of service as recommended in Chapter III.

B. OVERVIEW OF STORMWATER FUNDING MECHANISMS

Fairfax County has several funding options available by Virginia statute. However, standards and limitations exist that influence the viability of these different funding mechanisms. Stormwater funding mechanisms commonly used by local governments in the United States include taxes (e.g., on property, retail sales, real property sales, income, and business gross or net profits taxes), exactions, special assessments, and service fees (sometimes also termed user fees or service charges). Each has a different underlying philosophy that guides the structure of the funding mechanism and the use of the revenues.

Funding mechanisms can also be distinguished as *ad valorem* or *non-ad valorem*. *Ad valorem* simply indicates that something is imposed based on a percent of value. By contrast, *non-ad valorem* is associated with or conditioned upon the performance of an act, the engaging in an occupation, or the enjoyment of a privilege. The following is a brief overview of the different types of funding mechanisms.

Table IV.1: Summary of Common Stormwater Funding Mechanisms

Taxes	Most general purpose local governmental functions are primarily funded through taxes that simply generate revenue. For example, an ad-valorem property tax is often imposed upon real (and sometimes personal) property based on its value. The purpose is simply to provide revenue to defray the expenses of general government, as distinguished from the expense of a specific function or service. It is not necessary for a tax to have a demonstrable association with any particular purpose or function.
Exaction	An exaction, or excise tax, is most commonly associated with franchise rights and development-related activities or impacts. Over many years the term has come to mean and include practically any tax that is not an ad-valorem tax. An example is a franchise fee on a cable utility. The franchise fee is imposed based on the privilege of running wires along public rights-of-way, rather than any assessment of the value of the information transmitted. However, like other taxes, the ultimate use of the revenue does not need to be associated with its source.
Special Assessment	The essential characteristic of a special assessment is that it must confer some direct and special benefit to the property being assessed. A special assessment is based on the premise that the property assessed is enhanced in value at least to the amount of the assessment. Like service fees, special assessments are intended for a specific purpose rather than simply as a revenue generating mechanism. Assessments may be based on property value (<i>ad valorem</i>) or other factors (<i>non-ad valorem</i>) such as frontage along a street or sidewalk improvement.
Service Fee/ Stormwater Utility	A stormwater service fee, often referred to as a stormwater utility, is funded primarily through service or user fees or charges that are related to the cost of providing the services and facilities. Funding stormwater programs through dedicated enterprise accounting provides a mechanism for receipt and allocation of multiple revenue sources dedicated to stormwater management. A service



fee is imposed on persons or properties for the purpose of recovering the cost of providing service. A stormwater service charge rate methodology is adopted to set the appropriate fees and charges.

The stormwater funding options available to Fairfax County can also be described as “primary” and “secondary.” Primary methods have the capacity to support the entire program, while secondary methods are applicable to special needs or situations, but are not capable of funding a full program. The primary funding methods discussed in this paper might be used as the sole sources of funding for a program, but are more typically used in combination with secondary sources.

Table IV-2: Primary and Secondary Stormwater Funding Mechanisms

Primary Funding Methods	Secondary Funding Methods
<ul style="list-style-type: none"> • General Fund Appropriations • Stormwater Service Fees (Stormwater Utility) 	<ul style="list-style-type: none"> • Other Service Fees • Special Assessments • Pro Rata Shares • Watershed Improvement Districts • Federal and State Funding/Grants/Loans • In-Lieu-Of-Construction Fees • General Obligation and Revenue Bonding

Local governments across the United States have used all the funding mechanisms examined in this paper to some degree. Legislative and/or charter authority and the mission and priorities in each community have guided the selection of a preferred approach. There is no single funding mechanism that is best in every setting. Some funding sources are better suited to operations and maintenance, while others are used strictly for capital improvements. Adequate, consistent funding of a stormwater program is more important to the long-term success of the effort than the actual source of revenue. The following sections provide a synopsis of each of the primary and secondary funding mechanisms available in Virginia. Where applicable, each synopsis provides a description of how the revenue source has been used in Fairfax County to support the stormwater program.

1. PRIMARY FUNDING METHODS

a. GENERAL FUND APPROPRIATIONS

The majority of General Fund revenues in most Virginia localities are derived primarily from real property taxes. This is true in Fairfax County, where real property taxes comprise 60.7% of General Fund revenues. Other major sources of General Fund revenues in Fairfax County include personal property taxes (17.1% including reimbursements from Virginia as a result of the Personal Property Tax Relief Act of 1998) and other local taxes (14% including the local sales tax and Business, Professional, and Occupational Licenses). The demands on the stormwater system placed by a specific parcel have little relationship to property values or business sales activity levels. The system requirements are a function of the peak rate and total amount of stormwater runoff that must be carried safely through the community.



Typically, the revenue sources that support the General Fund are based on a “taxation” philosophy – the purpose of which is simply to raise revenue. It is not necessary that there be any association or relationship between the source of revenue and the purpose to which it is applied.

Using General Fund appropriations for stormwater management also produces a level of inequity in that some properties that place demands on the system may be exempt from property taxes. For instance, §58.1-3609 *et seq* of the Code of Virginia exempts a range of religious, charitable, patriotic, historical, benevolent, cultural, and public park and playground uses from real and personal property taxes. As a result, they do not participate in funding stormwater management through the General Fund. Similarly, some private properties, e.g. parking lots and storage warehouses that have large expanses of impervious coverage, do not pay real property taxes commensurate with the demands they impose on the stormwater system. Conversely, some properties that have little impact on stormwater runoff but pay proportionately higher property taxes are paying more for stormwater management through the General Fund than they would through funding methods based on the actual demands they place on the system.

General Fund appropriations for any specific purpose can also be highly uncertain from year to year, as revenue is not dedicated to any specific purpose. Allocations shift with real and perceived priorities. Stormwater management needs are likely to receive a higher priority in a year following severe storms and drainage problems than in a year following a drought. This makes it difficult to engage in long-term planning for the program.

One option often considered by local governments to provide a source of revenue for stormwater functions is to dedicate a portion of the real property tax. A unique example is Prince George’s County, Maryland, which taxes real property at a rate of \$0.135 per \$100 of assessed value for stormwater management. It is important to note that the funding generated by this tax is set aside in an enterprise fund that must be used for stormwater by State law. The funding scheme is unique in that the tax was established by Maryland when the Washington Suburban Sanitation Commission (WSSC) had responsibility for stormwater in the County. This authority was then transferred to Prince George’s County. There is no parallel enabling authority established in Virginia.

In Virginia, the City of Fairfax established a separate stormwater management fund in the mid-1990s that is funded through the real property tax. The portion of the real property tax going to the fund is determined each year by the City Council based on the fund balance versus the needs contained in the City’s stormwater capital program. The capital program was first developed in 1991, and is periodically re-assessed. During the first few years of program implementation, the dedicated portion of the real property tax ranged from \$0.01 to \$0.02 per \$100 of assessed value. However, there is currently an unspent balance in the fund, and no allocations have been made in the past few years. If additional project needs arise, then additional funds may be allocated. Unlike Prince George’s County, the portion of the real property tax going to stormwater in the City of Fairfax is not presented as a separate tax, but is simply a part of the overall budget deliberations. Therefore, stormwater funding is still subject to competition with other budget priorities.

Application in Fairfax County Fairfax County’s existing stormwater management program is largely funded through General Fund appropriations. The General



Fund could potentially support an increase in spending on stormwater programs either through a tax increase or through reallocation of current resources. Reductions in other services funded from the General Fund to avoid a tax increase may or may not be publicly acceptable. The Fairfax County Board of Supervisors adopted an FY 2005 real property tax rate of \$1.13 per \$100 of assessed value, which was reduced from the FY 2004 rate of \$1.16. At FY 2005 real property values, each penny the tax rate is increased results in approximately \$14.5 million in revenue generated.

b. STORMWATER SERVICE FEES (STORMWATER UTILITY)

Service fees are becoming an increasingly popular source of dedicated stormwater funding, with over 500 in existence throughout the United States. In Virginia, stormwater service fees must be based on some measure of a property's contribution to stormwater runoff. Table 3 presents Virginia's stormwater utility enabling legislation.

Table IV- 3: Stormwater Utility Enabling Legislation

The enabling legislation for stormwater utilities in Virginia (Code of Virginia §15.2-2114) specifically states that:

1. A utility can be established, by ordinance, to cover the following costs:
 - a. Acquisition of real and personal property to construct, operate and maintain stormwater control facilities;
 - b. Cost of administering programs;
 - c. Engineering and design, debt retirement, construction costs for new facilities and enlargement or improvement of existing facilities;
 - d. Facility maintenance;
 - e. Monitoring of stormwater control devices;
 - f. Pollution control and abatement, consistent with state and federal regulations;
 - g. Planning, design, land acquisition, construction, operation and maintenance activities.
2. Charges shall be based on contributions to stormwater runoff.
3. Charges may be assessed to property owners or to occupants, including condominium unit owners or tenants (if tenant is the one who is being billed for water and sewer).
4. Utility shall waive charges in the following cases:
 - a. From federal, state and local government agencies, when the agency owns and provides for maintenance of storm drainage and stormwater control facilities or is a unit of the locality administering the program.
 - b. From roads and public street rights-of-way that are owned and maintained by state and local agencies.
5. Utility may waive charges, partially or in full in the following case:
 - a. From cemeteries.
 - b. From any person who owns and provides for complete private maintenance of storm drainage and stormwater facilities, provided such person has developed so that there is a permanent reduction in post-development stormwater flow and pollutant loading.
6. Locality may issue general obligation bonds or revenue bonds to finance the cost of infrastructure and equipment for a stormwater control program.
7. In case of failure to pay fees, the agency can charge interest on past due amounts and can recover by action of law or suit in equity and shall constitute a lien against the property, ranking on parity with liens for unpaid taxes.

The general standard applied to utility fees is that the rate methodology must be fair and reasonable, and resultant charges must bear a substantial relationship to the cost of providing services. However, the local government has a great deal of flexibility in



attaining these objectives in the context of local circumstances. When stormwater utility rates have been subjected to legal challenges, the courts have tended to apply “judicial deference” to the decisions of locally elected officials. Under judicial deference, the courts will not intervene unless a plaintiff can demonstrate that the decision was arrived at arbitrarily and capriciously or that the result of the decision discriminates illegally.

Stormwater service fees typically provide more stable revenue than other funding options, offer the opportunity to design a service fee rate methodology that results in an equitable allocation of the cost of services and facilities, and, in some cases, can provide an opportunity to shift a portion of the community’s stormwater management burden away from the General Fund. Service fee rate structures are designed to recover costs based on the demands placed on the stormwater systems and programs.

Based on an analysis by AMEC Earth & Environmental, Inc., the average single-family stormwater utility charge nation-wide is \$3.05 per month. Table 4 provides information on existing stormwater utilities in Virginia.

Table IV- 4: Fiscal Year 2003-2004 Data on Stormwater Utilities in Virginia

Locality	NPDES Phase I / Phase II	Single-Family Residential Stormwater Fee	Commercial Stormwater Fee Per Month	Total Annual Revenue Generated
City of Norfolk, VA	Phase I	\$5.40/month	\$0.124 per 2,000 sq. ft. of impervious area	\$7.4 million
City of Virginia Beach, VA	Phase I	\$4.29/month	\$4.29 per 2,269 sq. ft. of impervious area	\$12.7 million
City of Portsmouth, VA	Phase I	\$3.50/month	\$3.50 per 1,877 sq. ft. of impervious area	\$2.6 million
City of Newport News, VA	Phase I	\$3.10/month <i>See note 1.</i>	\$3.10 per 1,777 sq. ft. of impervious area	\$5.5 million
City of Hampton, VA	Phase I	\$3.50/month	\$3.50 per 2,429 sq. ft. of impervious area	\$3.7 million
City of Chesapeake, VA	Phase I	\$2.55/month	\$2.55 per 2,112 sq. ft. of impervious area	\$4.2 million
Prince William County, VA	Phase I	\$1.73/month <i>See note 2.</i>	\$0.84 per 1,000 sq. ft. of impervious area	\$2.8 million

Note 1: The City of Newport News bills multifamily residences at 0.42 ERUs, or \$1.30 per month.

Note 2: Prince William County bills apartments, condominiums, and townhomes at $\frac{3}{4}$ of the single family rate, or \$1.2975/month. Prince William County’s single-family residential ERU equals 2,059 sq. ft. of impervious area.

The revenue generation capacity of a stormwater utility is similar to that of the real property tax, except that the utility fee is directly linked to impervious surface cover or another measurable characteristic, rather than assessed value. Determining a legally defensible rate needed to generate revenue sufficient to finance the County’s



stormwater needs would require the County to engage in a “stormwater utility rate study.” During this study, important policy decisions are made that can have significant implications for the selected rate. An important first step in the process is to determine the average impervious land cover in square feet for a single-family residential lot. Although it is common for all single-family lots to be charged a flat fee, the Equivalent Residential Unit (ERU) is applied to all other classifications of land. For example, if the ERU is 2,000 square feet of impervious surface, and the fee is \$2, a commercial lot with 10,000 square feet of impervious surface cover would pay \$10 ($10,000/2,000 = 5$ ERUs multiplied by \$2).

In addition to technical determinations, the County must address a range of policy questions that ultimately impact the structure of the utility, as well as the stormwater utility rate. Major policies questions are presented in Table 5.

Table IV-5: Policy Decisions Affecting Utility Rate and Structure

Policy Decisions Affecting Utility Rate and Structure

1. **Program:** Will all, or only part of the current program/service elements identified in the program evaluation be shifted to the enterprise fund?
2. **General Fund:** Will the utility pay for services received from the General Fund such as general overhead? (Indirect Cost Allocation)
3. **Special Fees and Other Revenues:** What additional revenue sources will be used, or created, to support stormwater programs that may result in a more equitable distribution of costs (existing or future increases in fees for erosion and sediment control; fees for inspection of private BMPs; grants, etc.)?
4. **Financial Factors:** What is the fund balance test that must be maintained by the enterprise fund? Is interest earned by the cash flow from the utility credited to the enterprise fund? What is the “bad debt” factor (based on history of collecting fees)? Are fund balances appropriated in the following year?
5. **Reserves:** Will an emergency reserve be established to address catastrophic system failures? What level of operating reserve will be maintained?
6. **Bonds:** Will bonds be used to pay for the capital improvements program?
7. **Rate Allocation:** Will gross lot area be utilized along with imperviousness in the rate methodology?
8. **Exemptions:** Will exemptions be established other than those legally mandated by state statute?
9. **Credit Policy:** What will be considered for “credits” (i.e., stormwater management facilities that treat and/or detain stormwater from a specific site or sites) under the program?
10. **Billing:** What portion of the billing costs will be transferred to the stormwater enterprise fund? What portion of customer service costs will be transferred to the utility?
11. **Rate Policy:** Is it a goal that the rate be held constant for 3 years? Or 5 years? Or will the rate be adjusted annually?
12. **Bill Receipt:** Who will receive the bill, owners or current utility customers (such as renters and leasers)?



All of these policy decisions will need to be considered as part of a rate study should the County decide to pursue the implementation of a stormwater utility.

Application in Fairfax County A stormwater utility fee has not been implemented in Fairfax County. However, the potential implementation of a utility fee has been the subject of several County studies.



2. SECONDARY FUNDING METHODS

a. PLAN REVIEW, DEVELOPMENT INSPECTION, AND SPECIAL INSPECTION FEES

Most jurisdictions offset, at least in part, the cost to review plans and issues permits related to stormwater management by imposing various fees.

Application in Fairfax County In Fairfax County, the Office of Site Development Services is responsible for applying most environmental and stormwater related fees. For example, review of a Water Quality Impact Assessment under the County's Chesapeake Bay Preservation Ordinance is partially offset by a \$175 application fee. Similarly, a fee of \$800 must be submitted to cover the costs associated with drainage studies. Various plan review fees are contained in Section 104-1-3 of the County Code. By July 2006, Fairfax County will also begin collecting fees for Virginia Pollutant Discharge Elimination System (VPDES) stormwater construction permits. Responsibility for implementing this program will be transferred from the Virginia Department of Environmental Quality to Fairfax County under HB 1177 passed by the General Assembly in 2004. How much this new program will cost the County will depend on the fee amount, which is set through a State regulatory process.



At present, the County estimates that fees recuperate approximately 80% of the cost of providing specific services. Overall, however, these fees do not represent a major source of revenue. Although increased fees are an option, limitations in the amount of development will necessarily limit the amount of money that can be raised in this way.

b. SPECIAL ASSESSMENTS

The essential characteristic of a special assessment is that it must confer some direct and special benefit to the property, or properties, being assessed. Special assessments for stormwater are most workable in very localized applications. For example, improving a ditch or channel that directly serves a few properties or a relatively small area is an appropriate project for special assessment funding. A special assessment is based on the premise that the work being done enhanced the value of the properties assessed in an amount at least equal to the amount of the assessment. Like service fees, special assessments are intended for a specific purpose rather than simply as a revenue generating mechanism. A common requirement of assessments is that there must be a rational linkage (nexus) between the use of the revenue derived from the assessment and the benefit to the party to whom it is applied. Assessments may be based on



property value (ad valorem) or other factors (non-ad valorem) such as frontage along a street or sidewalk improvement.

In Virginia, one tool available for the creation of a special assessment for localized areas of a jurisdiction is the service district. The Code of Virginia (§15.2-2400) spells out that “Any locality may by ordinance, or any two or more localities may by concurrent ordinances, create service districts within the locality or localities... Service districts may be created to provide additional, more complete, or more timely services of government than are desired in the locality or localities as a whole.” Service districts can provide a wide variety of services, and are usually used for water and sewer services, garbage removal and disposal services, and private street and road maintenance.

Service districts have not been used to fund holistic stormwater management in Virginia. While “stormwater management” services are not called out specifically, §15.2-2403(1) notes several specific services that are tangentially related to stormwater management, including the ability “to construct, maintain, and operate such facilities and equipment as may be necessary or desirable to provide additional, more complete or more timely governmental services... including but not limited to... street cleaning (and) snow removal.” In addition, changes to §15.2-2403(1) enacted in the 2003 session of the General Assembly includes similar authority to “control infestations of *insects that may carry a disease that is dangerous to humans*” (HB1881) which could be tied to concerns over standing water in the storm sewer system and stormwater BMPs. These service districts also have the power to levy and collect “an annual tax upon any property in such service district subject to local taxation to pay, either in whole or in part, the expenses and charges for providing the governmental services authorized...” (§15.2-2403(6)). These funds must be segregated from General Fund dollars and be expended in the district in which they were raised.

Application in Fairfax County In Fairfax County, several service districts and special tax districts have been created for various purposes. These are presented in Table 6. However, none of these districts are for stormwater management, nor has the County ever considered the creation of a service district for stormwater.



Table IV-6: Service Districts/Special Tax Districts in Fairfax County (FY 2004)

Leaf Collection	\$0.01 per \$100 of assessed value on residential, commercial, and industrial properties within sanitary districts.
Refuse Collection	\$210.00 annually within sanitary districts.
Gypsy Moth Control	\$0.001 per \$100 of the valuation of real estate within Fairfax County.
Water Service Districts	Clifton Forest Water Service District. On any lot within the district, an annual assessment of \$661 for thirty years commencing July 1, 1993. The Colchester Road-Lewis Park Water Service District. On any lot within the district, an annual assessment of \$959 commencing January 1, 2003 for thirty years.
Reston Community Center	This special tax district operates with a levy of \$0.052 per \$100 of assessed value on properties located in the district.
McLean Community Center	This special tax district operates on a levy of \$0.028 per \$100 assessed value on properties located in the district.



Burgundy Village Community Center	This special tax district operates on a levy of \$0.02 per \$100 assessed value on properties located in the district.
Route 28 Transportation Tax District	This special tax district operates on a levy of \$0.20 per \$100 assessed value on commercial and industrial zoned property, or property used for commercial or industrial purposes within the district. This tax levy does not apply to residential property.

c. PRO-RATA SHARES (PRS)

Under the Code of Virginia (§15.2-2243), “A locality may provide in its subdivision ordinance for payment by a subdivider or developer of land of the pro rata share of the cost of providing reasonable and necessary sewerage, water, and drainage facilities, located outside the property limits of the land owned or controlled by the subdivider or developer but necessitated or required, at least in part, by the construction or improvement of the subdivision or development;...” The enabling legislation specifically includes drainage work for the protection of water quality and the mitigation of increased stormwater flows as permissible uses of these funds. Funding is typically held in a cash escrow account until such time as the stormwater management facility or BMP is constructed. Funds must be utilized for facility or BMP construction within twelve years of the date they were posted. If not, the posted cash escrow reverts to a tax credit on the real estate taxes due on the property at the time of escrow expiration. Pro-rata accounts are typically most effective in communities experiencing significant, sustained growth.

Application in Fairfax County Fairfax County operates under a Pro-Rata Shares (PRS) program approved by the Board of Supervisors in 1991. Typical projects constructed with pro-rata share funds address flood control, stormwater drainage issues, severe streambank erosion, and impaired or reduced stormwater quality. Completion of the County’s system of regional ponds is a major purpose of the program. However, County budget documents note that the program is insufficient to cover all the County’s stormwater capital improvement needs. This is reflected in a statement in the County’s Regional Ponds Report that funding has been available to implement only one-third of the planned 150 regional ponds envisioned for the County.



From 1992 through 2004, the PRS program has generated a total of \$41.2 million in revenue for stormwater related projects. Since \$7.8 million was rolled over from the former PRS program, revenue over the last 12 years has averaged \$2.8 million per year. Most of that revenue has been allocated to specific projects, with only \$1 million in recently received revenue not yet being allocated. \$16.1 million in PRS funds were actually spent during this time period, while another \$4.8 million is currently encumbered due to contracts and agreements.¹ Therefore, the County has a total of \$19.3 million allocated to projects that are still awaiting construction or further design.

The \$19.3 million in unencumbered PRS funding can be broken out into the following approximate dollar amounts per priority area:

¹ The average annual PRS expenditure between 1998 and 2003 was \$1.5 million. In 2004 this increased to \$2.4 million largely due to the implementation of regional ponds along rapidly developing Route 29 corridor and the watershed planning program.





- \$5 million.....Regional pond projects on hold.
- \$4 million.....Regional ponds to be implemented over the next two years.
- \$4 million.....Watershed plan projects.
- \$6 million.....Various stormwater projects.

Fairfax County faces two major challenges associated with the PRS program. The first challenge is that because the PRS program is driven by new development, it will eventually cease to serve as a major revenue source once the County reaches build-out. If this is estimated to occur in approximately 20 years, the County anticipates that the revenue generating capacity of the PRS program between 2004 and 2024 will be approximately \$45 million, or an average of \$2.2 million per year. The second challenge is that while the total life-span of the PRS program is about 20 years, many watersheds, particularly in the eastern portions of the County, are currently at or near build-out. Because PRS funds must be spent in the same watershed where they were generated, many of the County’s older urbanized areas will not be able to rely of PRS funds to solve evolving stormwater issues such as stream restoration, bacteria contamination, and infrastructure repair and rehabilitation. An illustration of this point is to compare the Cameron Run watershed, which was developed primarily during the 1950s and 1960s, with the Cub Run watershed, which is now experiencing rapid growth. While both watersheds have significant stormwater issues, over the past 10 years the PRS program has generated an average of \$17,852 per square mile per year in the less densely populated Cub Run watershed. By contrast, the PRS program generated an average of only \$4,693 per square mile in the more densely populated Cameron Run.

d. WATERSHED IMPROVEMENT DISTRICTS

The Code of Virginia (§10.1-614 through 635) allows for the creation of watershed improvement districts (WIDs), noting that “Whenever it is found that soil and water conservation or water management within a soil and water conservation district or districts will be promoted by the construction of improvements to check erosion, provide drainage, collect sediment or stabilize the runoff of surface water, a small watershed improvement district may be established within such soil and water conservation district or districts... (§10.1-614)” Statutorily, WIDs have the power to levy and collect taxes and/or service charges to be used for the specific purposes for which the WID was created. WIDs are not widely utilized as they require a two-thirds majority vote via a referendum of landowners in the proposed district for both district creation and district tax and fee levying authority.

Application in Fairfax County Only two WIDs currently exist in Virginia, including Lake Barcroft in Fairfax County. The revenue generating capacity of a WID can be significant, since it is typically linked to real property value and included on the real property bill at a pre-established rate. For example, Lake Barcroft in FY 2005 set the assessment at \$0.113 per \$100/assessed value for a total of \$610,000 in annual receipts. However, while the enabling legislation for WIDs is broad enough to potentially allow a WID to become a primary funding source for a community-wide stormwater management program, the practical applications and limitations of this mechanism have not led to any such use as a primary resource.

It is also important to note that the annual budget and assessment rate for a WID in Fairfax County is subject to review and approval by the Northern Virginia Soil and Water Conservation District, and then the Virginia Soil and Water Conservation Board. In



addition, a separate WID Board of Trustees must be elected to manage the fiscal affairs of the WID.

e. IN-LIEU-OF-CONSTRUCTION FEES

The major advantage of in-lieu-of-construction fees is that revenue from smaller projects can be combined to be used on a regional basis, or where measures can have the most impact. In-lieu-of-construction fees also allow a locality to gain some benefit if it is determined that a stormwater requirement should be waived or reduced due to site specific constraints. A disadvantage of in-lieu-of programs is that the revenue stream is dependent upon the pace and nature of development from year-to-year. As a result, in-lieu-of fees are usually best applied to one-time projects or programs.

Application in Fairfax County Fairfax County had an in-lieu-of-construction fee system until the adoption of the Pro-Rata Shares program in the early 1990s. At that time, the County determined that the two programs were in conflict and the in-lieu-of-construction fee system was abolished. Currently, if a stormwater requirement is waived, there is no monetary recuperation.



Neighboring Arlington County and the City of Alexandria have adopted fee-in-lieu-of programs under their Chesapeake Bay Preservation Ordinances. Under these programs, land disturbers may, under specific circumstances, pay into a fund (Watershed Management Fund in Arlington/Water Quality Improvement Fund in Alexandria) in lieu of constructing an on-site stormwater management facility. Payment into the fund is based on a dollar amount per square foot of impervious surface cover that would need to have otherwise been treated. In Arlington, the current fee of \$2.50 per square foot of impervious surface cover was set in February 2003. Alexandria has not yet set a rate under its newly revised ordinance. In Arlington County, it is estimated that the Watershed Management Fund has a short-range annual revenue generation capacity of approximately \$300,000.

f. FEDERAL AND STATE FUNDING OPPORTUNITIES

There are very limited federal and state funding mechanisms available to provide ongoing support for local stormwater management programs. Federal involvement in stormwater management (other than regulatory programs) is typically limited to advisory assistance, cooperative programs such as those provided by the United States Geological Survey and the United States Army Corps of Engineers, and emergency response. The Commonwealth of Virginia has stormwater initiatives in both the Department of Environmental Quality and the Department of Conservation and Recreation.

One way that many communities have succeeded in acquiring limited funding for stormwater management projects is through grants. Federal and state governments, as well as select foundations, have provided project funding for communities that are willing to propose and implement innovative projects to control stormwater runoff or restore streambeds to a more natural condition. In Virginia, the Water Quality Improvement Act (WQIA) was established in the 1990s to support Tributary Strategy implementation through the creation of the Virginia Water Quality Improvement Fund (WQIF). However, the WQIF allocation formula for state funding leaves it vulnerable to the ebb and flow of



Virginia's economic climate, and thus has been an inconsistent funding source. Another major source of grant funding is the Chesapeake Bay Program's Small Watershed Grants Program. In 2003, the Chesapeake Bay Program disbursed approximately \$2.75 million to 75 recipients, with a typical range of \$20,000 to \$40,000 per recipient. However, both the WQIF and the Small Grants Program exclude projects involving direct regulatory compliance, thus rendering them unusable for direct funding of mandated permit compliance activities.

A common requirement of grant funding is local cost-share. One advantage of having a dedicated source of revenue for stormwater is a greater ability to take advantage of state and federal cost-share programs. For instance, Prince George's County, Maryland, which has a dedicated source of stormwater funding, takes advantage of over 90% of federal flood control cost-share opportunities.

Application in Fairfax County Recent examples of state and federal funding received by Fairfax County include (approximately):



- \$6 million in federal funding earmarked for rehabilitation of dams associated with four PL 566 flood control facilities in the Pohick Creek watershed.
- \$250,000 provided by the Federal Emergency Management Agency in response to Hurricane Isabel to re-map floodplains in the New Alexandria area; and,
- \$2.1 million provided by the U.S. Army Corps of Engineers (in addition to \$211,000 in cost share provided by Fairfax County and Prince William County) to dredge the Occoquan River.

g. GENERAL OBLIGATION AND REVENUE BONDING

Virginia statutes (Code of Virginia §15.2-2114) authorize the use of bonds by local governments to finance capital improvements to infrastructure and equipment for stormwater control programs. Bonds are not a revenue source, but a method of borrowing. They are most commonly used to pay for major capital improvements and acquisition of other costly capital assets such as land and major equipment. Capital improvements can also be funded through annual budget appropriations, but annual revenues are often not sufficient to pay for major capital investments.

The chief advantage of bonding is that it allows construction of major improvements to be expedited in advance of what can be funded from annual budget resources by spreading the cost over time. In the case of stormwater management, expediting a capital project by several years through bonding may result in significant public and private savings if flooding, other damaging impacts, and inflation of land acquisition and construction costs are avoided. The major disadvantage of bonding is that it is essentially a loan that incurs an interest expense, which increases the overall cost of capital projects, land acquisition, etc.

The two most prevalent types of bonding available are general obligation (GO) bonding and revenue bonding. GO bonding incurs a debt that has "first standing" with regard to public assets and is backed by the "full faith and credit" of the issuing agency. Because of this, public approval through referendum is required for initial issuance of GO bonds. All revenues, including various taxes, may be used to service GO debt. Revenue



bonding is supported and ensured solely by revenues that are typically linked to the capital expenditure and recovered through some type of fee or specific tax. Creation of a separate source of revenue that is earmarked specifically for stormwater management (e.g., a stormwater service fee) would allow the County to sell revenue bonds if market acceptance was attained. However, revenue bonding would not be backed by the County's full faith and credit, and would typically incur a slightly higher interest rate.

Generally speaking, bonds are not intended for use as a funding mechanism for day-to-day operations. However, some costs can be viewed either as a capital or operating expense. The lack of a clear distinction between remedial repairs and new construction, for example, results in bonding sometimes being used for major repairs that might also be considered an operating expense.

Application in Fairfax County The last GO bond for stormwater infrastructure approved by Fairfax County voters was the 1988 Storm Drainage Bond Referendum. The bond was in the amount of \$12 million. The last bonds were recently sold, and all money is obligated and will be spent in the next few years. It is worth noting that not all bonds pass the scrutiny of the voters. A 1990 stormwater bond presented to Fairfax County voters was defeated. There have been no additional stormwater bond attempts since that time.



h. OTHER INNOVATIVE FUNDING ARRANGEMENTS

While the above represent the most typical sources of revenue for stormwater, Fairfax County has had success in creating innovative funding arrangements to meet specific needs. For example, the County has just recently started to require maintenance escrow accounts for innovative BMPs and Low Impact Development techniques such as rain gardens. While the arrangement doesn't represent a new source of funding for new projects, it does create an insurance policy so that County funds will not need to be spent correcting for maintenance deficiencies on private property. While these agreements are currently done on an ad hoc basis depending on the facility, this practice may grow if it is successful.

The County is also implementing an innovative program with respect to state and federal wetland mitigation banking requirements. Until recently, mitigation could take place anywhere within two large watersheds (Upper Potomac and Occoquan) – and not necessarily within Fairfax County. As a result of conversations with the Army Corps of Engineers, developers pay the Nature Conservancy, which keeps the funding in escrow until there is a local project. There is no estimate yet on the revenue generating capacity of this mechanism.

C. SUMMARY OF GENERAL APPLICABILITY OF REVENUE SOURCES

The following is a comparative summary of the generating capacity, equitability, and stability of the primary and secondary revenue sources discussed in this paper, charting the funding strategy by whether it provides a "high," "medium," or "low," ability to meet the needs of the stormwater program. General comments are provided to provide context for the rating.



Revenue Source	AREA OF APPLICABILITY								
	Generating Capacity			Ability of Source to Finance Stormwater Equitably			Stability of the Source		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
Real Property Tax (General Fund)	High	Medium	Low	High	Medium	Low	High	Medium	Low
	General Fund revenues can provide for the full cost of service to the community.			Owners of real property pay regardless of contribution to stormwater infrastructure.			Stability for stormwater dependent on other annual budget priorities.		
Stormwater Utility Fee	High	Medium	Low	High	Medium	Low	High	Medium	Low
	Stormwater user fees can provide for the full cost of service to the community.			Owners of real property based on contribution to stormwater infrastructure.			Based on assessment of stormwater needs.		
Inspection/ Review Fees	High	Medium	Low	High	Medium	Low	High	Medium	Low
	Relatively minor, but can fund substantial amounts of specific program functions.			Strong link between the source and the regulated activity.			Based on rate of development.		
Special Assessments	High	Medium	Low	High	Medium	Low	High	Medium	Low
	Assessment is determined by cost of improvements needed. Generation capacity significant for localized projects.			Used for a small area where a specific improvement is required and specific properties directly benefit.			Stable source of revenue once established.		
Pro-Rata Shares	High	Medium	Low	High	Medium	Low	High	Medium	Low
	Medium to high depending on the watershed. Used to make regional improvements over time. Typically not sufficient to cover the cost of all improvements.			Funding provided by those that impact the drainage basin. In newly developing areas, this can be highly equitable.			Based on rate of development.		
In-Lieu-of-Construction Fee	High	Medium	Low	High	Medium	Low	High	Medium	Low
	Used to combine revenue for use in larger projects, or where greater water quality benefits can be realized.			Same issue as pro-rata shares. Depending on what the fee is in lieu of, there may need to be a nexus between how the funding is spent and water quality improvements.			Based on rate of development.		
Watershed Improvement District	High	Medium	Low	High	Medium	Low	High	Medium	Low
	Medium to high based on area of the WID and the assessment rate. Difficult to establish.			Must be a direct link between the source and beneficiaries.			Based on assessment of stormwater needs.		
State/Federal Grants	High	Medium	Low	High	Medium	Low	High	Medium	Low
	Typically less than \$100,000. \$30,000 to \$50,000 common.			Use is dictated by the grant source.			Used for specific demonstration projects, not a stable source of revenue.		



AREA OF APPLICABILITY									
Revenue Source	Generating Capacity			Ability of Source to Finance Stormwater Equitably			Stability of the Source		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
Bonding	Capacity can be significant.			Bond debt paid only by all taxable property owners regardless of contribution to stormwater infrastructure. No non-taxable properties contribute to reducing the debt.			Applicable for one-time capital expenses. Not meant as a source of revenue for ongoing expenses.		



CHAPTER V

STORMWATER USER FEES AND FUNDING OPTIONS

A. CHAPTER SUMMARY

Following this Chapter Summary is a detailed discussion of the rate structure options that were reviewed by the consultant team and staff during the development of the recommendations for cost allocation policy identified in this opening summary. The rate structure recommendation was based on an evaluation of the methodologies available today that can create a legally defensible allocation of costs to the community, or rational nexus between the services provided and the cost of those services to any individual property. The options were evaluated using the following criteria:

- Equity in the apportionment of costs
- Flexibility of methodology to address level of service
- Consistency with other County financing policies
- Compatibility of cost allocation tool with existing data processing systems
- Data requirements to support allocation of costs to each property
- Cost of implementation and upkeep of the billing database
- Revenue stability and sensitivity to change

The methodologies reviewed included *imperviousness*, *imperviousness and percent imperviousness*, *imperviousness and gross parcel area*, and *gross area with modifying factors*. Each methodology was evaluated against the criteria listed above and the findings are provided following this summary.

Preliminary Recommendation for Rate Methodology: The primary methodology for allocation of costs recommended is “imperviousness” on the property with a secondary factor of the gross parcel area. Imperviousness has been evaluated and identified as the key contributor to demand for services in stormwater, whether it is for routine drainage, flood controls, public safety, or water quality. There exists a strong body of research detailing the correlation between the development of a parcel and the impacts of that development on the drainage system and the overall services to be provided by local governments throughout the nation. It is recommended that gross area be included as a secondary rate factor to address those services that must be provided regardless of the presence of imperviousness and that should be fairly borne by all properties within the County. This increases the equity of the rate methodology, not limiting it to only land that has been disturbed and by taking into account the total lot size along with the amount of imperviousness.

Modifying Factors: Many modifying factors were considered in the development of the rate structure preliminary recommendation. These includes such items as *water quality impact factor*, *service charge credits*, *watershed surcharges*, *base rate for fixed costs*, and *varying approaches to single family residential properties*. Upon completion of the





evaluation for Fairfax County, the modifying factors of service charge credits and a tiered single family detached-housing rate structure are recommended. Service charge credits provide an opportunity for the County to recognize contributions made by private investment in the drainage system and in water quality protection that reduce the demand for service. A tiered single family residential rate structure also increases the equity by recognizing the varying amount of imperviousness present within this relatively homogenous land use activity. The County should consider whether it wants to place a limit on the number of billing units to be charged single family detached residential, which often occurs in the initial establishment of stormwater utility rates.

Preliminary Recommendation on Rate Modifiers: Combining a primary methodology of imperviousness and gross parcel area with the modifying factors of a multi-tiered residential rate with service charge credits will provide the County with an equitable basis of cost allocation that is legally defensible, that can be understood by the general public through a targeted education program, and that will be administratively manageable. Over time the County may choose to refine the rate structure to include additional elements of watershed surcharges, water quality impact factors, and a base rate for fixed costs. These additional factors can refine the equity of cost allocation but are not critical in the short term to effectively establish a stormwater user-fee funding strategy. These additional factors often require more detailed program cost tracking and administrative overhead to ensure fair allocation of costs occur.

Estimated Rate Based on Imperviousness ONLY: Upon completion of the program evaluation and analysis of the projected service enhancements to begin to build a proactive stormwater program, an analysis of potential rates was undertaken. The approach to estimating a rate was to use Imperviousness only as the rate methodology. This was done due to constraints on time, data availability and critical policy decisions that must be made to finalize a rate. Basic assumptions regarding fund balance, level of other incomes such as the use of Pro Rata Share and fees for regulatory inspections, debt service and credit initiatives were made as well to ensure that these issues were not overlooked in the preliminary analysis. If the Board moves forward with this effort, these key policies will be established and factored into a detailed Rate Study.

It is estimated that an initial rate of \$55.00 a year, increasing to \$84.00 a year for every 2000 square feet of imperviousness could provide sufficient revenue to support the first steps to build a comprehensive stormwater program, over the five year planning period. If the County chooses to move ahead with finalization of the recommendations on program enhancements and funding implementation, a very detailed cost of service and rate analysis will be completed and a refined rate structure with the final recommended rate will be provided.

The following background discussion provides, in detail, the results of the evaluation of each methodology and modifying factor.



B. BACKGROUND

1. PURPOSE

Several ways of structuring and calculating stormwater service fees (or “user fee charges”) are employed by cities and counties throughout the United States. This discussion paper summarizes several rate options available to Fairfax County. The basic parameters employed for rate structures, plus modifying factors that can be applied are described. Other funding methods that can be blended with fees are identified and discussed in the paper on funding methodologies.

The initially preferred rate structure identified in the Executive Summary above along with the mix of funding sources may have to be adjusted as needs change over time. Information will flow from the future watershed master planning that may suggest that substantial capital investment is needed in the drainage system, greater than anticipated today, and that these cost should be borne by the properties located within each watershed. More remedial repair and capital improvement needs may be identified as capital improvement plans are implemented and as existing systems continue to age. Stormwater quality management may become an even more demanding part of the program as the regulatory structure to address the Chesapeake Bay evolves along with Total Daily Maximum Load programs from the State. Fortunately, the stormwater utility approach provides excellent flexibility to adjust as the needs evolve, including allowing changes in the program, funding demands, and rate concepts.

2. EVALUATION CRITERIA

The consultant team’s experience implementing a variety of stormwater funding methods elsewhere suggest that the most important factors in selecting a practical approach are the local circumstances, practices, and politics within Fairfax County. Every community is different and needs a solution that fits its specific situation. Beyond circumstances unique to Fairfax and the enabling legislation of the State, the following criteria were used in defining the rate structure recommendations for funding stormwater:

- attainment of equity in the apportionment of costs;
- the balance of rates with level of service;
- data requirements to support cost allocation methods;
- cost of implementation and upkeep;
- compatibility with existing data processing systems;
- consistency with other local financing and rate policies;
- financial sufficiency;
- revenue stability and sensitivity; and
- flexibility to address unique conditions.

None of the service charge rate structures or secondary funding methods examined during the policy review for this initial evaluation for the utility is "perfect" under such a broad range of criteria. The listed order of the criteria above does not imply a priority, and no single consideration should outweigh the others to the extent that a rate methodology or secondary funding method is selected or rejected for any one reason.



3. FRAMEWORK OF RATE STRUCTURE COMPONENTS

The stormwater rate methodologies, rate modifiers, and other funding methods identified in this discussion paper provide a menu of options to Fairfax County. Basic rate structure concepts are the foundation of a service fee. Modifying factors (such as how rate decisions will impact single-family residences and use of base rates for fixed costs per account) enable a basic rate methodology to be fine-tuned. Also, several other funding methods can be used in coordination with a service fee rate methodology to optimize funding for the entire program, such as grants and loans. The relationship between service fee rates and the cost of providing services and facilities should be evident in the rate design.

4. SERVICE FEE RATE STRUCTURE OPTIONS

The proposed program strategy is designed to address the problems that result from increased volumes and rates of runoff and pollution of receiving waters found in Fairfax. Thus, the costs incurred in providing the program services can be traced back to the cumulative impacts of many individual properties. The various parameters and calculation methodologies commonly used in stormwater management rate structures are intended to quantify the relationship between conditions on individual properties and the demands they impose on the municipal stormwater program and systems. Many factors influence the amount, peak rate, and pollution loading of stormwater runoff from properties, ranging from the nature of the land surfaces to vegetation and soil characteristics. Other services must be provided regardless of a property's impact on the drainage system, such as public education, inspection of the system, watershed planning and Federal water quality permit requirements.

Four rate structure options are examined in this report. After review, it was determined that two factors are better suited for Fairfax and are included in the initial recommendation for implementation of the utility as described in the Executive Summary above. Seven modification factors are also examined. Several secondary funding methods are also integrated in the funding strategy.

The basic rate methodologies examined were:

- impervious area;
- impervious area and the percentage of imperviousness;
- a combination of impervious area and gross area; and
- gross property area and the intensity of development.

Modifying factors could be used to alter the basic rate methodologies, including the following:

- a simplified single-family residential rate;
- a tiered rate for single-family residential with a cap on the billing units;
- a base rate for certain fixed costs of service;
- watershed or other surcharges for localized costs;
- service charge credits;
- a water quality impact factor;
- a development and land use factor; and



- a level of service factor.

In addition to utility service charges, other funding methods or sources of funding were examined during the development of the funding methods discussion paper. Most would be used only in special situations or be applied to limited clientele groups. Secondary funding methods or sources previously evaluated were:

- General Fund appropriations;
- Special assessments;
- Bonding for capital improvements;
- In-lieu of construction fees;
- Other Service Fees;
- Pro Rata Share;
- Watershed Improvement Districts; and
- Federal and state funding opportunities.

Except for General Fund appropriations along with Pro Rata Share and bonding for infrastructure capitalization, these supplementary funding methods would generate only a minor portion of the total funding that is needed to support the proposed program. The primary purposes of most would be to enhance equity, improve public acceptance of the utility concept, and expedite special components of the stormwater management program. A full discussion of each of these methodologies can be found in the Chapter IV.

5. EVALUATION OF BASIC RATE METHODOLOGIES

a. IMPERVIOUS AREA RATE METHODOLOGY

Stormwater rate methodologies based solely on impervious area have been widely used. They are simple, easily understood by the general public, and impervious area data is relatively inexpensive to measure or obtain. The perceived equity of an impervious area rate methodology is high. Most people understand the hydrologic impact of covering natural ground with pavement and rooftops. Large expanses of roofs and pavement in shopping centers and other commercial and industrial business areas are highly visible.

Numerous technical studies, references, and citations in engineering literature technically validate the general perception of the equity of an impervious area rate methodology. The coefficient of runoff decimal value in hydrologic engineering tables closely approximates the percentage of impervious cover. Empirical evidence gathered in the field by monitoring changes in peak runoff before and after development verifies that impervious coverage is the key factor influencing peak stormwater runoff. Stormwater quality data gathered during the National Urban Runoff Program (NURP) and subsequent research also indicate that impervious area is the single most dominant factor in pollutant loadings in stormwater.

Many impervious area rate structures include simplified single-family residential service fees, often as flat-rate charges applied to all such properties. Charges to non-residential properties may be structured in a variety of ways under an impervious area methodology. In some cases the average amount of impervious area on single-family residential properties is used as an "equivalent unit" value for determining service



charges to non-residential properties. In other instances 1000 square foot ranges of impervious area are used. These are commonly referred to as a “range” value or “billing unit. “

Service fees are usually calculated by dividing the amount of impervious area on each parcel by the equivalent unit value or the range value and multiplying the result times a charge per unit. Very few stormwater service fee rate algorithms use the exact amount of impervious area on each property because the accuracy of the impervious area data typically available does not support such a precise calculation. Comparing charges to dissimilar properties is easy when an equivalent unit value is used.

An impervious area service fee rate methodology introduces a potential “timing” problem in the allocation of the cost of capital improvements because the service fees would be applicable only to developed properties. Stormwater capital improvements are typically designed to accommodate future growth by over-sizing systems relative to current conditions and needs. Other funding mechanisms, such as system development charges, can be used in concert with an impervious area rate methodology to ensure that undeveloped properties ultimately participate equitably in the cost of capital improvements designed to serve them or inclusion of the gross parcel area, as evaluated below, can also provide increased equity.

The data requirements associated with implementing and maintaining a stormwater service fee depend more on the subtleties of the rate methodology and the use of modifying factors than on the basic parameters selected. For example, if an impervious area method were to be applied to all properties individually, Fairfax would have to generate impervious area information for residential as well as non-residential parcels. However, if a simplified residential service fee is utilized, data requirements and costs might be reduced by the percentage represented by the single family residential lots of the total parcels in the County.

The cost of implementing an impervious area rate structure is a function of the number of properties that must be measured, the accuracy standards adopted for data, and the measurement technique employed. Accuracy standards influence the cost of both initial implementation and subsequent data maintenance.

An impervious area rate methodology is highly stable and insensitive to property alterations by ratepayers for the purpose of reducing service fees. Reductions in impervious coverage are rarely justified merely to reduce stormwater fees. Alterations to properties that would reduce stormwater fees are essentially infeasible under all the rate structure options examined in this study.

The rate of revenue growth using an impervious area methodology would more or less correspond to the pace of development. Economic downturns would tend to diminish the addition of new impervious area to the rate base and thus the stormwater revenue growth under this methodology.

An impervious area rate methodology is not as flexible as some other options. It is based on a single parameter that can be accurately measured. The primary means of introducing flexibility into an impervious area methodology is through modifying factors and by allocating certain costs to other rate mechanisms or funding methods.



b. IMPERVIOUS AREA AND PERCENTAGE OF IMPERVIOUS COVERAGE

Under this methodology the amount of impervious area and the impervious percentage are both used in the calculation of service fees, dictating that data on both impervious and gross area be assembled. Typically, under this type of methodology the impervious area of each property is charged at varying rates depending on the percentage of imperviousness of the property. Each square foot of impervious area is charged more as the percentage of imperviousness increases. Gross area is not relevant to the service fee calculation, except that it is needed to determine the percentage of imperviousness. Undeveloped lands would not be charged because this rate methodology would be based on impervious area.

Some anomalies may occur in service fees under this type of rate methodology. Smaller properties are often charged more than larger properties that have the same amount of impervious area because the percentage of imperviousness on the smaller property is higher. The typical approach divides properties into several classes based on their percentage of imperviousness (referred to as “ratio groups” or “imperviousness classes”) and applies a varying rate per impervious area unit to each class. For example, properties having ten (10) percent imperviousness or less might be charged \$.04 per year for each 100 square feet of impervious coverage, while properties with eleven to twenty (11 – 20) percent imperviousness might be charged \$.10 per year for each 100 square feet. Proportionately higher values are usually applied as the percentage of imperviousness increases.

Being based on two parameters that are accurately measurable (impervious area and gross area, from which the percentage of imperviousness is calculated), this approach gives an impression of greater accuracy than some other options. Engineering judgment is introduced to the service fee calculation in the schedule of charges for various imperviousness classes. It is questionable, however, whether this method actually generates service fees that are more accurate in relation to actual runoff discharged from individual properties and/or to the cost of services and facilities.

The community’s perception of equity resulting from this rate methodology may be mixed, and may depend on the number of classes or ranges used for percentage imperviousness and the schedule of rates assigned to them. To the extent that a shift in the apportionment of costs toward more heavily developed properties benefits single-family residences, homeowners would likely see a lower bill than under other rate structures. They might view the balance of services and charges favorably. As originally applied in Denver, Colorado, for example, this methodology resulted in much higher charges for intensely developed properties than would be the case under other stormwater rate structures. While that approach benefits single family residential properties, intensely developed commercial properties bear a much higher proportion of the cost of service.

It must be recognized that this methodology can create anomalies in the service fees relative to those that result from other rate methodologies. For example, a smaller property (gross area) with the same amount of impervious coverage as a larger property would pay more under this methodology. Comparing a half-acre property (21,780 square feet) with a 30,000 square foot property when both have 20,000 square feet impervious coverage, the example schedule of rates would yield service fees of \$240 per year for the smaller property and \$152 for the larger one. The smaller property



would be charged almost sixty (60) percent more. Clearly, these calculations are a function of the specific schedule of rates used in this example and could be changed by simply adjusting the schedule. However, the potential weakness of this approach in terms of equity problems is evident. The general problem of rate and service level balance cited for other rate structures applies more or less equally to this approach. Whether Fairfax could demonstrate a 60 percent variance in level of service to the smaller property is unknown.

This rate concept would require that both gross area and impervious area data be gathered. Future maintenance of the data for developing properties could be accomplished by requiring that gross area and impervious area data be supplied to the County by each developer's engineer or architect as part of the project plans.

The stability and sensitivity of this rate methodology is consistent with the other options considered in this report. Even using a highly progressive schedule of rates, the level of service fees would probably not induce property owners to remove impervious area from their properties. It simply is not cost effective for most property owners to reduce the impervious area (and thus impervious percentage) just to reduce a stormwater service fee.

c. IMPERVIOUS AREA AND GROSS AREA

Both the total property area (gross area) and impervious coverage of properties influence the amount, peak rate, and make up of stormwater discharged to the public drainage systems. A combined impervious area and gross area rate methodology can be a relatively simple and effective means of accounting for the two primary parameters that influence stormwater runoff. However, most stormwater rate methodologies utilize one or the other parameter in the calculation of fees rather than both. Those who use both recognize the need to include undeveloped parcels in the overall rate base as well as the need to allocate costs on the basis of community-wide services, regardless of drainage system demands for service as measured by imperviousness.

This type of rate methodology requires that the mix of impervious and gross area in the service fee calculation be "tuned" to properly reflect the significance accorded to each parameter. This is achieved by applying weighting factors to gross and impervious area or by allocating certain costs of service to each parameter. The relative weights assigned to gross and impervious area should be consistent with the local hydrologic conditions, patterns of development, program requirements (e.g., operating versus capital needs), the balance of stormwater quantity and stormwater quality in the program costs, and/or the community's perceptions. When costs are allocated to the two parameters, practices elsewhere have tended to assign seventy-five (75) percent or more of the costs to the impervious area component of the rate.

The concept underlying this type of rate methodology is relatively easy to explain and grasp. It is consistent with the public's general understanding of hydrology and the impact that gross area and impervious coverage has on stormwater runoff. This type of rate methodology shifts a portion of the cost burden to lightly developed and undeveloped properties than other methodologies do that are based strictly on impervious area. Depending on the weighting factors used and/or the cost allocations, however, smaller properties that are almost entirely covered with impervious surfaces



could conceivably be charged more than larger properties that are undeveloped or very lightly developed with little impervious coverage.

Solely for the purpose of illustrating how fees might be calculated, assume that each 100 square feet of gross area might be charged \$.05 (five cents) per year. A surcharge of \$1.00 per year for each 100 square feet that is covered by impervious area might be applied. This would yield an effective ratio of 1:21 between areas that are pervious and those that are impervious. That is, the area of a property covered by impervious surfaces would be charged twenty-one times as much as the area that is not impervious. Applying the example values cited above to an eight thousand (8,000) square foot property with 2,000 square feet of impervious coverage would result in a total service fee of \$24 per year or \$2 per month. The charge for the gross area of the property ($8,000/100 \times \$0.05 = \$4/\text{year}$) would be added to the charge for the impervious coverage ($2,000/100 \times \$1 = \$20/\text{year}$).

Applying the same values to a small commercial property of 30,000 square feet (about .7 acres) having 20,000 square feet impervious (67%), the annual service fee would be \$215.00 per year (\$15/year for the gross area and \$200/year for the impervious coverage). Thus, the stormwater service fee would be approximately nine (9) times as much as that for the example 8,000 square foot residential property even though the commercial property is only three and three quarters (3.75) times larger in gross area. The proportionately greater increase reflects the more intense development of the larger parcel in this example (67% impervious coverage versus 25% for the residential example). If it is assumed that an 870,000 square foot shopping center is completely covered with impervious rooftops and paving, the annual service fee would be \$9,135 (\$435 for the gross area plus \$8700 for the impervious coverage), or \$761.25 per month. In both of the commercial examples, the gross area/impervious area rate methodology results in lower fees for the non-residential properties than does the impervious area methodology examined previously because of the introduction of the gross area factor that distributes costs across all parcels in the County. A gross area/impervious area rate methodology might conceivably allow undeveloped properties to be charged which would have to be addressed in policy considerations.

The cost of implementation and upkeep of this type of rate methodology would be influenced by the unit cost of assembling data for the master account file and the computer programming associated with the billing/collection and billing inquiry response processes. Using a flat-rate charge for one or more classes of properties would substantially reduce costs. Maintenance of the information might also be simplified by requiring data from developers' engineers and/or architects when plans are submitted.

This approach is comparable to the other options in its stability and insensitivity to external influences. Being based on gross area and impervious area, there is little that can be done by a property owner to reduce the two parameters that determine the service fee.

Applying weighting factors or allocating costs to gross area and impervious area makes this approach especially flexible. A broad range of relative weights could be assigned to gross area and impervious area, and might even be varied to account for unusual conditions in certain areas or the presence of modifying considerations like on-site detention, non-standard service levels, or water quality impacts.



d. GROSS AREA AND INTENSITY OF DEVELOPMENT

A rate structure based on the gross area of each property and its intensity of development would be very similar to the rate structures currently used by Bellevue and Tacoma, Washington and Cincinnati, Ohio. In most cases, the term "intensity of development factors" is used rather than a "coefficient of runoff", primarily because the engineering terminology is often confusing to lay persons while the relationship of intensity of development to stormwater runoff is more easily grasped.

If applied to every parcel, this type of rate methodology would require that the gross area be determined for, and an intensity of development rating be assigned to, all residential as well as non-residential properties. Most communities have opted to apply a simplified service fee or schedule of fees to one or more categories of single-family residential parcels, but there is no uniform practice. Non-residential properties are usually categorized into groups ranging from "very lightly developed" to "very heavily developed". If a flat-rate residential charge is not used, all residential properties are typically assigned to one or two of the intensity of development categories.

From five to eight classes or groups are typically used for classifying the intensity of development. An intensity of development factor is usually very close to the coefficient of runoff that would be assigned to a parcel if its hydrologic performance were individually determined. Discrete intensities of development have not been applied to each individual property. Typically, the intensity of development values range from a low figure such as .02 to .20 for very lightly developed properties up to .85 or even .95 for heavily developed industrial and commercial uses.

This approach groups similar properties and applies average values to all within a given classification. For example, all apartments might be classified as multi-family residential with an intensity of development factor equal to .60 instead of assigning individual ratings ranging from .50 to .75 to individual apartment developments. The gross area parameter is the controlling element of the rate calculation for all parcels in a given classification. Thus, an apartment building on 40,000 square feet of gross lot area would be billed one-half the amount charged to an apartment building on an 80,000 square foot property, assuming both were assigned the same intensity of development.

The perceived equity of this type of rate structure is normally equal to or greater than that of other approaches, but (like the others) the methodology requires a careful explanation to the community. Simplifying the terminology associated with the rate methodology is desirable.

Adjustments to individual bills or even entire classes of properties can be achieved in this type of rate structure by simply reducing or increasing the intensity of development factor for an individual parcel or for a class or other grouping. It is common for jurisdictions using this approach to adopt a policy of assigning an "effective" intensity of development to individual properties in response to service fee appeals, leaving the door open for adjustments that achieve a fair and reasonable rate when anomalous conditions exist on individual properties.

Data requirements associated with this type of rate methodology would be less than for other options. Gross area information could be generated from current databases and/or maps. The assignment of an intensity of development factor would require that



engineering judgment be used in reviewing the conditions on each parcel, possibly using aerial photographs. Some additional work would be needed in the event that undeveloped properties were to be charged.

Local development patterns may influence how residential properties are treated. A single residential intensity of development category might be sufficient in a community that has highly uniform residential zoning and development. Two, three or more intensity of development categories might be appropriate in another community that has residential lots ranging from 3,000 square feet to several acres. The County of Bellevue, Washington uses discrete gross area measures for every property, which has increased data management costs. Long-term maintenance of the account files for an intensity of development rate structure would be slightly less than what is required for options based in some manner on impervious area. Compatibility with the data processing systems should not pose a problem if an intensity of development approach is selected.

This type of rate methodology tends to push a greater proportion of the cost of service onto residential and other lightly developed properties than methodologies based on impervious area. Like the other stormwater rate structures examined in this study, the revenue capacity of the gross area/intensity of development approach is relatively stable and insensitive to external influences. Alterations to properties that would diminish revenue would rarely be economically feasible.

The flexibility of an intensity of development rate structure is equal to or somewhat better than other methods because of the latitude available in defining the intensity categories and assigning intensity of development factors to individual properties. Engineering judgment must be applied in determining the intensity of development (coefficient of runoff) of a parcel in a given situation, and the engineering literature offers rather broad ranges of development intensity values. For example, values from .25 to .45 are not unusual for single-family residential parcels. Single-family residential properties may fall anywhere within this range depending on lot size, the amount of impervious area, soil conditions, slope, property shape, vegetation, and even the location of the impervious areas on the property.

6. EVALUATION OF MODIFYING FACTORS

The reasons for using modifying factors to adjust a basic stormwater service charge rate structure include the following:

- improve the overall equity of the financing mix;
- fund special operational and regulatory programs; and
- reduce implementation and upkeep costs.

Since the modification factors examined in this study would affect only a portion of the total properties, they have relatively minor impact on total revenue capacity. They are not intended to simply generate additional revenue. Rather, their primary purpose is to improve overall funding equity. In several cases, any additional revenue generated by a modifying factor is merely incidental to the role that the stormwater management program plays as a regulatory and/or operating agency. In the case of a service fee credit for on-site detention, the modification would reduce rather than increase total



revenue capacity. The advantages gained using these factors must be weighed against the disadvantages they entail in terms of gathering and maintaining data.

a. SIMPLIFIED SINGLE-FAMILY RESIDENTIAL SERVICE FEES (FLAT RATE OR TIERED)

The vast majority of cities and counties that have stormwater service fees employ a simplified charge for single-family residences. Some use a single flat-rate charge while others have two or more flat-rate categories or classes of residential properties (usually based on the amount of gross or impervious area). A few cities use two or more tiers of flat-rate charges, segregating mobile homes, small-lot residential, large-lot residential, etc. A few communities use purely discrete charges for each residential property based on the same parameter applied to non-residential properties, calculating the billing units of imperviousness for each parcel.

The principal reason for using a simplified rate for single-family residential properties is to reduce the expense of developing and maintaining a master account file and billing system. A simplified residential rate typically reduces up to eighty (80) percent the number of properties for which data must be assembled on one or more parameters such as gross area, impervious area, etc. The cost of developing a file can be cut simply by grouping residential properties in a single class or a few tiers. However, it must be cautioned that using tiers or several "classes" requires data on each parcel that will allow the County to assign the single family home to the correct tier or class.

Although the principal motivation for using a simplified residential rate is usually to reduce costs, equity does not necessarily suffer. Detailed cost of service analyses conducted in Cincinnati, Tulsa, and Louisville all indicate that the cost of stormwater management services and facilities actually declines as the gross area of residential lots increases. The analyses suggest that an inverted residential rate structure might even be warranted. This is primarily due to the type and size of drainage facilities required for intense, small lot residential development in the core of urban cities versus large lot suburban and rural styles of subdivision. Small-lot neighborhoods typically require underground structural stormwater systems, whereas large-lot residential areas often have less expensive open ditches and natural drainage courses. However, this is not easily understood by the general public or by politicians and can cause great difficulty in communication with the rate payers on how their individual fee was generated.

Implementation of a simplified residential rate would only require that single-family residences be "tagged" in the master account file. This could probably be done from tax records. File maintenance would involve minimal upkeep costs to track the addition of new single-family residential development. Compatibility with existing or additional data processing systems should be easily assured. No problems of compatibility are foreseen even if two or more tiers of flat-rate charges are used for single-family residences.

During policy discussions with the Technical Committee there was an interest in distinguishing between smaller impervious single family residential (SFR) properties and the significant number of single family residential properties with large amounts of imperviousness.



b. BASE RATE FOR CERTAIN UNIFORM FIXED COSTS

Fairfax's stormwater management program will incur certain fixed expenses that are not related to the amount of runoff generated by individual properties or the level of service that is provided. Expenses such as administrative overhead, risk management (insurance), master planning, maintenance of a system inventory, and water quality education are difficult to allocate specifically to individual properties or classes of properties. For example, it costs the same to send a bill to a residence as to a shopping center.

In distributing fixed costs among ratepayers, a common "base rate" may be charged to every account. It is generally a more equitable allocation of such costs apportioning them based on parameters like impervious area. Other Utility rates often include two elements, a "service" charge and a "quantity" or "usage" charge. For example, the service portion of a water or electric utility fee usually covers meter reading, meter maintenance, and some administrative and overhead costs. The quantity portion of the charge recovers generation, treatment, distribution, collection, and capital costs. A stormwater base rate modification for stormwater service fees is simply an extension of the same concept to stormwater management rate design.

Relatively few stormwater service fees include base rates. Those that do tend to use base rates averaging between \$.25 and \$1.00 per month. Citizens and businesses alike usually view this type of modification as an equitable refinement of a rate structure. The impact on service charges is minimal, usually creating a slight increase in residential charges and a very minor reduction in charges to larger, non-residential properties.

This type of modifier is more advantageous for a large commercial property that has many billing units than for a single residence. Non-residential accounts would tend to receive a larger reduction in their differential service fee because most have more than one billing unit for imperviousness. Since they would pay the same charge for base rate costs, but less on each billing unit for imperviousness, their net change would be a comparative decrease in fees. The amount of the comparative decrease would vary with the size and/or impervious area of each property and the rate methodology used.

The impact on total revenue resulting from a base rate is negligible. Proportionately residential rates are higher than when "base rate" is used and the charges to very large and/or heavily developed properties decline minimally (depending on the rate parameters employed). The impact of such a shift needs to be carefully considered.

c. LOCALIZED SURCHARGE FOR CAPITAL IMPROVEMENTS

One of the more significant modifications that might be made in a basic rate structure would be to shift from area-wide funding of major stormwater system capital improvements to a localized surcharge. The most common approach to this is a basin-by-basin (or watershed) allocation of capital costs.

While localizing capital costs appears on the surface to be both proper and practical, potential flaws must be carefully considered. Property owners would pay for the stormwater management systems necessary to serve their area only, and would not bear the cost of facilities elsewhere in the community. However, a potential equity



problem exists in using this methodology in Fairfax County. A portion of the community's prior investment in stormwater management facilities has been made with County-wide financial support. The remainder was built by developers or other public agencies such as VDOT without similar County support.

Stormwater improvements funded by the County from general revenues have been made on a priority basis in the past without necessarily considering which watershed was involved or where the revenues were generated. The costs of many stormwater capital improvements built in the past have been distributed throughout the community. The cost of others, especially contributed capital built by developers, has been localized by incorporating the costs into the sale of residential lots or rental rates for commercial properties. Shifting to localized allocation of capital costs at this time could mean that areas now in need of system improvements would have to bear the entire cost after having shared in the previous public infrastructure investment that was made in other neighborhoods.

A few communities have enacted stormwater service fee surcharges for properties located in their floodplains, based on the rationale that those properties are receiving a greater degree of service than less flood-prone areas in the form of reduced risk exposure. Boulder, Colorado, for example, employs a modifying factor in its stormwater service fee rate structure by applying a forty (40) percent surcharge to its normal service fees for properties located in its floodplains. The justification, originally expressed in the Town's Ordinance No. 3928, is that stormwater and flood management facilities "above and beyond those needed to protect other parcels of land within the Town", will need to be constructed by the Town in the floodplain.

Boulder determined that a differential of forty (40) percent is consistent with engineering estimates of the difference in cost between lowering flood levels to the historic level versus lowering them below the historic level to protect properties within the historic floodplains. Boulder's Ordinance No. 4946 simplifies the justification, simply citing the need to compensate for additional facilities to protect and serve floodplain properties by adding the flood-prone property surcharge to the stormwater bill.

A floodplain surcharge would generate additional stormwater management revenue, but more refined data would have to be assembled on the flood-prone areas of the County and the amount of additional revenue that would be created to quantify the revenue potential. The amount of additional revenue cannot be accurately projected at this time because of the limited data that is available on floodplains and the cost of service attributable only to service requirements of properties located in floodplains.

The best guide for a decision on this type of modification may be found in the local practices related to funding of water and wastewater system improvements. Similar differences in the cost of comparable service also exist in those systems, and capital costs are not allocated area by area. For example, substantially more investment has been needed to serve areas remote from the water and wastewater treatment facilities than those that are nearby, yet rarely will you find water and sewer rates that include a factor for utilization of the capital investment in distribution or collection systems.

The data requirements for this type of rate modification would be somewhat complicated. Each property would have to be located in its proper major drainage basin and/or sub-basin using topographic maps. The GIS system might enable this to be done





relatively easily. This information could be coded in a stormwater master account file, allowing the service fees to be adjusted basin-by-basin (or in some other rational manner) to generate the revenue required to meet capital improvement needs for each watershed. Impact on the data processing systems would include modifications to the file structure and the rate algorithm.

The compatibility of this concept with existing capital funding policies in Fairfax County is rather low. The long-term impact of this type of rate structure modification might be to restrict revenue capacity of a service fee methodology well below its overall potential. As localized capital costs are applied to charges in a given drainage basin, the willingness-to-pay of ratepayers in that area could be exhausted. Experience in other communities, including Louisville, Kentucky and Tulsa, Oklahoma suggests that funding stormwater capital needs on a basin approach might ultimately hinder the full build-out of the needed capital projects. The cost of stormwater improvements in many areas is simply more than can be borne by local property owners alone, yet the projects may have County-wide significance.

d. SERVICE FEE CREDITS

Perhaps the most widely practiced modification to basic stormwater management rate structures is the application of a credit adjustment. Credits are commonly provided for properties that have on-site detention or retention facilities to control the peak rate of stormwater runoff and safely store the excess stormwater temporarily or for an extended period. Such controls reduce the capacity requirements (and cost) of downstream systems to attain a given service level and may enhance water quality if properly designed and maintained.

In most cases detention or retention systems are designed to approximate pre-development conditions or the capacity of downstream facilities. Detained stormwater is released at a controlled rate after the peak runoff has receded. Retained stormwater is infiltrated into the soil or allowed to evaporate, so retention is usually practiced only in areas with excessively drained sandy soils and high temperatures such as Florida and some portions of the western United States.

Service fee credits have also been adopted in some jurisdictions for properties subject to and in compliance with NPDES permits and for public and private secondary and high schools providing approved water quality education programs. The rationale for the latter credit is that education is an emphasized program component in many NPDES stormwater discharge permits. If not provided by the local schools it would have to be performed by the stormwater management entity at additional cost to the ratepayers.

Various means are employed to provide service fee credits to properties having on-site detention.

- Boulder, Colorado's rate ordinance directs that stormwater service fees be reduced for properties providing on-site detention, but the amount of reduction is not specified. The Town's administratively adopted practice is to reduce the normal service fee twenty (20) percent for an on-site detention system that meets its standards for a 5-year storm event detention facility. Systems that meet the 100-year storm event detention requirements are eligible for an eighty (80) percent reduction in the service fee.



- Bellevue, Washington changes the intensity of development classification of properties with detention systems to that of very lightly developed land, resulting in a variety of percentage reductions, depending on the intensity of development classification normally applied to the subject property.
- Charlotte, North Carolina allows up to fifty (50) percent credit for peak runoff attenuation and up to twenty-five (25) percent credit for total flow volume reductions.
- Practices elsewhere are to reduce service fees between twenty-five (25) and seventy-five (75) percent.

The primary intent of credits for on-site detention or retention is to recognize reductions in the cost of public stormwater services and facilities that are attributable to private systems or activities. Typical detention/retention credits against monthly service fees provide a relatively modest economic incentive to developers. Rarely do they offset the loss of space such facilities occupy or the degree to which on-site systems disrupt the layout of commercial properties and subdivisions. Nor do most credits consider the water quality impacts of on-site systems, or their influence on the cost of stormwater quality management.

The structure of credits sometimes changes over time with shifting program priorities, authority, and legal limitations.

The balance of fees with the level of service required and provided is, at least in theory, improved by the use of credits. On-site control of the peak flow of stormwater runoff means that a property requires less service (in terms of downstream capacity) from the stormwater management system. Downstream reductions in peak runoff allow a higher level of service from a given size of facility or enable a community to build smaller systems in the future to attain a given level of service objective, reducing capitalization costs. A detention credit could be valid in Fairfax in terms of stormwater quantity management, as well as stormwater quality management controls for water quality protection. A reduction in pollutant discharges into the public systems should translate into lower NPDES permit compliance costs, but it is unclear whether any elements of the County's current program might possibly be reduced or eliminated by virtue of the private properties' compliance with their permits. In addition, it is appropriate public policy to consider whether all structures should be eligible for credits if they are required by the County's current engineering requirements in order for construction of impervious surface to occur. This is a key public policy that must be considered prior to initiation of any credit program.

An additional administrative cost would be incurred to assemble and maintain the data to support credits, especially with regard to existing on-site systems or activities performed by property owners. Developers' engineers can provide the information required to incorporate a credit for on-site detention and other mitigative measures on properties that are developed in the future. Credit calculations are relatively easy. An allowable runoff release rate based on pre-development conditions and required on-site storage capacity can be used to determine the effectiveness of on-site detention facilities for crediting purposes.



No substantial data processing capability would be required to enter a credit into a property's stormwater service fee billing file. The adjustment could be made to the data in the billing file addressed by the rate algorithm rather than by adjusting the parameters used in the basic service fee calculation, or a percentage reduction could be applied to the service fee. This would allow the credit for any specific property to be rescinded easily if an on-site detention facility is altered or is not maintained in proper operating condition, or if a property owner ceased adhering to the conditions of an NPDES permit.

In most communities the long-term impact on revenue resulting from this type of adjustment factor is minor compared to the basic revenue capacity of a stormwater service fee. Credits elsewhere have not diminished long-term revenue capacity more than five (5) percent. Ratepayers who do not have on-site systems (or NPDES permits if a water quality credit is adopted) would have to pay slightly more to cover the revenue reduction resulting from the credits.

e. WATER QUALITY FACTOR

The water quality impacts of stormwater discharges are becoming a much greater concern than in the past. Historically, municipalities have focused on flooding, erosion, and sedimentation problems resulting from stormwater runoff because of their direct and visible impact on people and property. As the general public's concern for the environment and interest in water quality have grown in recent years, the attention given to stormwater quality has also. As noted above, stormwater service fee credits for water quality control are now being adopted in some jurisdictions. In the same spirit, a water quality "factor" might also be applied within the basic rate methodology to allocate increased County costs associated with water quality impacts to those properties having the greatest influence on the need for pollutant control services and systems.

The key difficulty in administering this type of fee factor is that the attributes, characteristics, or conditions of properties which degrade water quality are hard to conclusively identify and may change quickly. It is difficult to assign such costs specifically to individual properties on the basis that their on-site conditions or actions might cause water pollution if they did something wrong.

Quantifying their impacts on the cost of public services and facilities at an acceptable level of accuracy for cost allocation purposes is virtually impossible at this time because of the limited data available. In addition, much of the cost of stormwater quality management is preventive or speculative, i.e. local governments must attempt to identify potential sources of pollution and regulate in various ways to prevent impacts from occurring. Many of the necessary components of an effective program are applied community wide (for example, education) rather than isolated to specific properties.

Analyses conducted during the National Urban Runoff Program (NURP) research project suggest that the single most significant factor influencing pollutant loadings in stormwater is the percentage of impervious coverage. This is logical, considering the typical development patterns and runoff characteristics of intense industrial, commercial, and transportation land uses. Such properties are frequently covered almost totally with roofs and pavement. They are also subject to truck and heavy equipment traffic, and potential pollutants are commonly used, created, or transported on such sites.



Thus, imperviousness could be used to introduce a water quality component into service charge rates, even if that parameter was not used in the basic rate methodology. The actual use of the land, or the presence or use of pollutants on individual sites might be another consideration. However, these can vary from time to time and would require a great deal of monitoring and data management. Other mitigative conditions are equally hard to track, such as the presence of a grass buffer between paved areas and storm drainage ditches or streams.

In order to minimize the initial expense and data management demands of a water quality factor, most communities seeking to incorporate water quality costs into a stormwater rate methodology opt for imperviousness as the most suitable single measure. Some simply increase their basic stormwater service fee rates to meet the additional cost of service without changing their rate methodology.

f. DEVELOPMENT AND LAND USE FACTOR

The act of developing land and the long-term land use both impact stormwater runoff. A rate modifier could be used in conjunction with one or more of the basic rate structure concepts to account for the temporary impact of development and/or the permanent effects of land use on the quantity and quality of stormwater discharged to the public systems. The objective of this type of modifier would be to improve the equity of the distribution of the cost of services and facilities, especially as it pertains to properties undergoing development and those that have unusual impacts associated with their land use.

A development and land use factor can be designed to reflect the influence of site conditions that may vary among otherwise comparable developments, especially conditions which impact stormwater quality or quantity only temporarily during the development process or when certain activities are underway. The challenge is to define such influences with reasonable accuracy and quantify their impact. The balance between charges and the level of service provided is not precisely definable at the present time. Efforts to refine basic rate structures by introducing this type of factor have to be designed with the limitations in mind.

Data requirements for a development and land use factor should be minimized to the greatest extent practicable if one is employed. The cost of this type of modifier is primarily associated with the expense of assembling data and maintaining it. The expense could be minimized by using qualitative rather than quantitative attributes and by grouping properties in similar categories. Development activities could be assigned to groups by degree of impact on stormwater systems and water quality. A rate modification value could be assigned to each group. Land use, which is an on-going condition, could be broken down into groups of uses that have similar potential impacts.

The key relationship to be reflected in this type of factor involves the impact of development activities and land use conditions on the cost of services and facilities. Ostensibly, it would include consideration of water quality as well as runoff quantity impacts. Data from planning, tax, hazardous and toxic materials inventories, and other existing sources may be sufficiently detailed to define groupings of land uses.

Virtually any approach would be compatible with the service fee calculation and billing options being considered, even if a secondary formula or reference to the another file



was required to generate this type of modifying factor. Financial sufficiency is not as critical a consideration in modifying factors as in the case of basic rate concepts. A development and land use modification to the basic rate concept would create only minor changes to the service fees for most properties, and would generate a limited amount of additional revenue. The revenue stability of this type of modifying factor is only moderately good because a portion of it is associated with the underlying pace of development. A modifier reflective of temporary development activities would generate only an interim addition to the revenue stream. One related to land use conditions could generate a permanent addition that would reflect the overall impact of certain land uses on stormwater management costs.

The flexibility associated with a development and land use factor is relatively good, since engineering judgment would normally be used in assigning modifying factors to individual properties or dividing similar properties into groups and assigning factors to the various groups. This type of modifier also is very adaptable to changing conditions as local areas are developed or redeveloped. It could create a minor shift in the distribution of stormwater costs of service related to development by assigning a greater portion of those costs to the development community.

g. LEVEL OF SERVICE FACTOR

Stormwater service levels vary across Fairfax County. Although the County's long-term objective is to provide a consistent level of stormwater services and facilities to similar areas and similar properties throughout the area, it is likely that actual service levels will continue to vary for the foreseeable future. The County may wish to consider a level of service factor that would reflect the status of services and facilities in certain areas relative to the County's service objectives in general, which could be adjusted over time as improvements in service is made. A better balance between the charges and the level of service actually provided to individual properties would improve the equity of cost allocations. However, the cost of doing so at this time through a modification factor may be higher than the additional degree of equity would warrant.

The primary objective of a level of service modifier is to improve the equity of charges when a broad range of service levels is being provided. In general, the County is providing a minimal level of day-to-day service. The County has not consciously adopted specific levels of service on a geographical basis, yet it is the nature of the problem that some low-lying or other physical areas may require higher levels of service.

The greatest obstacles to implementing a level of service modifying factor are that the County has not yet formally defined its service level objectives and does not have the data necessary to determine if specific areas are deficient, meet service objectives, or exceed them. It would be difficult to assign an economic value to incremental shortfalls in service level that now exist.

A great deal of preparatory work would have to be done to institute a level of service factor as part of the rate structure. First, detailed information about all the stormwater management systems would have to be gathered so that present conditions could be verified and a realistic service level objective could be defined. Second, the level of service actually provided to individual properties would have to be quantified in some way. Differing levels of service may be justifiable for some areas and/or for individual reaches in a watershed in terms of benefit/cost relationships and efficiency. Third, the



value of a diminished level of service below the objective would have to be quantified. The data requirements would be expensive to meet at the present time, given the limited amount of information that is presently available about the drainage systems and equally limited knowledge regarding levels of service.

Compatibility with existing databases and billing systems would not be a problem. A modification factor might be applied to areas or to individual properties based on service level information. This type of modifying factor would not significantly alter the financial sufficiency of a basic stormwater rate concept unless service fees were dramatically reduced to reflect service level deficiencies. Underlying rates might have to be increased to generate adequate revenue to meet the service level objectives. Properties receiving a fully adequate level of service might be charged substantially more in order to meet the overall stormwater revenue objective.

Overall revenue sufficiency and stability could be decreased by introducing a level of service factor into the rate structure as a modifier. It would give ratepayers another basis on which to appeal service charges, citing deficiencies in service level or differences in level of service relative to other comparable properties.

The flexibility added to a rate concept by introducing a service level factor might be substantial. Engineering judgment would have to be employed to define the various levels of service achieved in the current systems, the desired full levels of service that serve as objectives, the value of incremental deficiencies that exist, and how they should be incorporated into rates.



CHAPTER VI

COMMUNICATIONS PLAN SUMMARY

A. CHAPTER SUMMARY OF COMMUNICATIONS PLAN

The goal of developing a communications plan is to establish specific public involvement and education efforts that will assist Fairfax County in communicating stormwater needs and goals to the public and to build public support for the stormwater program and funding strategy. The public information and involvement effort supports several of the key objectives of the overall funding analysis plan. The Communications Plan (detailed Plan is Appendix IV of this report) addresses the following goals:

- To assess the resident's desired level of service for stormwater.
- To educate various stakeholders on the stormwater services provided by the County and to provide information on challenges for protection of water quality and quality of life for residents and businesses.
- To build a compelling case for establishment of a dedicated funding source to support stormwater management in Fairfax County.

1. SUMMARY OF PLAN - COMMUNICATIONS NEEDS

The Communications Plan considers the communications elements needed to address a change in stormwater services, expanding capabilities of the County for the management of drainage and protection of water quality, including a change in funding strategy. The Plan identified how specific methods and messages will relate back to the ongoing communications program in Fairfax County. The Plan targets the next 18 months in specific terms with suggestions for continuing processes to ensure an on-going strategy is maintained.

The Communications Plan specifically addresses the following issues:

- Recommendations on strategies for public involvement to gauge the level of service desired by Fairfax residents from their stormwater program.
- Effective strategies for engaging County officials regarding long-term solutions for stormwater related issues.
- Effective methods of engaging the public to maximize participation in decision-making.
- Process for development and utilization of a Resident-based advisory committee upon authorization of the implementation phase

The plan is divided into three phases, which evolve as more in-depth information is available and as the funding strategy decisions are finalized. In these phases, the kinds of information delivered become more specific, the audiences more broadly defined, and the media more widespread into the general community. Full details of the plan by phase starts on page 8 of this document.



2. ACTION ITEMS SUMMARY

There are several key communications needs that should be addressed within the activities and information tools that need to be developed within the next 60 days and targeted for the next eighteen (18) months. These communications needs fall into three categories – 1) written materials to be used throughout the program; 2) briefing key groups to start building support for the ideas; and 3) creation of a stormwater Advisory Committee to begin a dialogue with residents regarding the stormwater program needs and recommended levels of service. In addition, the County should maintain on-going outreach efforts within the watershed study process as well as other more routine activities, incorporating information from this study to reflect the project focus, status and potential outcomes.

Summary of Activities		
Activity/Audience	Now to 9-2004	9-2004 to 12-2005
Written Materials Audience: Staff Board of Supervisors Key stakeholders Media General Public	<ul style="list-style-type: none"> - Develop FAQs for use with staff, Board of Supervisors, County Leadership, general public and the Citizen Advisory Committee, targeting specific subject matter regarding key issues; roles; priorities; study outcomes and recommendations. - Provide customer service staff and appropriate field inspectors with names/contact information to refer questions to the correct person. 	<ul style="list-style-type: none"> - Update Web site to include FAQs and other briefing materials developed during the work of the Citizen Advisory Committee. - Prepare media briefing materials for use when critical decisions will be made. - Prepare monthly summaries of activities/progress for use by County Leadership and staff who are interacting with the public. - Develop printed materials that can be distributed to general public, placed in key County buildings and used in presentations, based on final decisions of County Board regarding changes in program and funding.
Briefings Audience: Board of Supervisors County Leadership Staff General Public	<ul style="list-style-type: none"> - Provide briefings on the status of the project, including a report to the Board of Supervisors, including the process, milestones, rationale of recommendations, implementation process. - Update County leadership, key Board members, staff, and the Board's Environmental Committee. 	<ul style="list-style-type: none"> - Maintain update for County Leadership, briefings of Board prior to key decision points, key staff leadership using written tools developed through the process. - Create an outreach program to take the message to the public through presentations to civic groups, community groups, watershed study teams, and other identified stakeholders.
Citizen Advisory Committee Audience: Committee Board of Supervisors County Leadership Media General Public	<ul style="list-style-type: none"> - Create structure for the committee and present in briefings of the County Leadership and Board of Supervisors. - 15-20 people to serve; identify specific recommendations on who should serve. - Identify mission for Committee - Develop schedule of meetings - Define process for committee operation. - Identify policy issues for their consideration. - Set date of first meeting. - Identify County staff support to the Committee. 	<ul style="list-style-type: none"> - Prepare briefing materials and potentially meet with each member prior to first formal committee meeting. - Provide Board with names and/or organizations recommended for appointment. - Prepare FAQ for Committee regarding role, mission, schedule, process and results of initial study. - Prepare meeting minutes and policy discussion papers and provide one week prior to each meeting to ensure effective discussions.



B. OVERVIEW OF THE PLAN

The goal of developing a communications plan is to establish specific public involvement and education efforts that will assist Fairfax County in communicating stormwater needs and goals to the public and to build public support for the stormwater program and funding strategy.

The Communications Plan is designed to work in concert with the overall Watershed Community Needs Assessment and Funding Options study. In some cases, the public effort leads development of the overall program by feeding relevant information to it (i.e. surveys and interviews); in some cases it validates the program by checking resident expectations (i.e., the Stormwater Advisory Committee), and in some cases it follows with public information and education that supports or explains the findings (i.e., bill stuffers and newspaper articles regarding the program).

A significant element of a public information strategy is to involve in a meaningful way specific stakeholder groups whose support is important to the success of the stormwater program and financing strategy. This Communications Plan is designed to incorporate internal and external communications strategies, to raise awareness of the issue of stormwater program needs and then to introduce the various audiences to the need for stable, adequate funding for stormwater programs in Fairfax County. Once awareness is raised, the communications strategy is to present a rationale and a convincing justification for the funding targets and level of service for the stormwater program. The strategy will define the compelling case for change.

The Communications Plan targets specific messages to specific audiences and is designed to take advantage of current, already-effective communications methods utilized in Fairfax County, as well as develop new communications tools/strategies to address gaps in current knowledge and interest regarding stormwater. Research takes place early to determine public knowledge of stormwater management services and their ranking of the importance of the service. The specifics of level of service for stormwater comes from this research, as well as from secondary research from earlier studies of the County, and are melded with strategic plan goals, overall program goals, VPDES Phase I and other regulatory requirements for public education and involvement, and builds the final plan to meet those requirements and desires. The plan also considers the spirit and intent of the Fairfax County Comprehensive Plan and the Board of Supervisors' Environmental Agenda and ties these efforts into the overall County vision.

This Communications Plan will be carried out in collaboration with the Fairfax County Office of Public Affairs. The Office of Public Affairs has great expertise in the Fairfax County audiences, media, and culture and it is anticipated will provide on-going advice and leadership into the implementation of the Communications Plan. In addition, OPA communicates regularly to and with the County Board of Supervisors and serves as a public information consultant to DPWES. They coordinate County outreach efforts utilizing a variety of media, including print, audio, visual, and Internet-based resources. In addition, where it is possible, the Office of Public Affairs can service Fairfax County's needs for printing, publication and support of the Communications Plan, as well as serving as the spokespersons for the program.



While developing the stormwater management program to meet level of service needs in Fairfax, the current public information efforts the County uses should continue. This is important for several reasons: 1) the public needs to know and understand their roles and responsibilities in terms of stormwater, and 2) the County has an obligation to provide public information, education, involvement and participation opportunities as part of the VPDES Phase I permit and other efforts. For example, residents participating in the “Explore Your Watershed Walks” sponsored by the Audubon Naturalist Society, Fairfax County Stream Protection Strategy and Northern Virginia Soil and Water Conservation District learn about organisms living in Fairfax County streams and could also be taught about how many streams in Fairfax County need restoration and how that is accomplished, along with how much it costs the County on an average year to keep up with the needs. In addition, there may be excellent opportunities with the current partners (the Northern Virginia Soil and Water Conservation District, the Northern Virginia Regional Commission, the Potomac River Greenways Coalition, watershed groups, etc.) to present public information regarding a specific communications campaign as it evolves. It may be appropriate to conduct a forum with all these groups to determine how they could become greater advocates for the County’s program due to their inherent interest in stormwater management issues.

This plan is built on an assumption of favorable action by the Board of Supervisors to move forward with enhanced stormwater services within the County, including a change in funding strategy that may involve the implementation of a countywide fee for service. The Communications Plan will follow the overall plan and date and/or strategies may change based on the program chosen by the Board of Supervisors.

1. PLAN STRUCTURE

The communications strategy for this project is based on continuing the basic ongoing communications program discussed above for stormwater management activities and developing a series of strategies that cover the various phases of public understanding of stormwater services, each one building on the last, growing and deepening public knowledge and, eventually, support for funding a strong stormwater management program.

In order to develop a plan for the public information and education program, we must first identify: (1) **the phases of the program**, (2) the relevant **target audience**, (3) **the message(s)**, and (4) **the media**, i.e. different ways available to the County to communicate its messages to the public. These elements are described in general terms in this section of the report. Specific information about how the communication plan uses these four elements is contained in Section 3 of this report, where the plan is divided by phase.

The development of a public understanding of the stormwater program funded by a user-fee has three phases: Community Outreach for Program Development, Program Adoption and Implementation (Year One), and the On-going Outreach and Communication period.





Phase	Community Outreach for Program Development	Program Adoption and Implementation for Year One	On-going Outreach and Communications
	JULY 2004-APRIL 2005	APRIL 2005 through FY 2006	FY 2007-ON
Timing	The process for gaining public input on needs, issues, level of service and funding options starts immediately and is completed at the time of action taken by the Board of Supervisors.	Developed during the finalization of the program recommendations and implemented during the initial changes in the program strategy and funding methodology.	Begins during implementation of changes in program and funding and continues through the life of the stormwater program.
Focus	Gathering and disseminating data and information, identifying and meeting with certain key stakeholders, educating the media, and developing new stormwater management program policy. Supporting Citizen Advisory Committee process, continued updates of County Leadership and staff.	Broad coverage of the needs and responsibilities of the stormwater program and reasons for the change in funding and program, examples of the effectiveness of the stormwater program and customer service responses to those with inquiries and complaints. Requires a strong customer service capability to address specific questions and general input.	Blends into the long-term public education program concerning stormwater, water quality, drainage management, customer service and regulatory compliance.

2. IDENTIFICATION OF TARGETED AUDIENCES

Target audiences are selected to bring in significant segments of the community at the appropriate time. There are consistent messages for the entire County (see item 3 below, “The Messages”). In addition, certain audiences that require special attention at varying times and varying depth during the process.

It is important to craft a public information strategy that targets specific stakeholder groups whose support is important to the success of the program and financing strategy. The target audiences are both internal and external and form the initial critical mass to gain acceptance of the program. These audiences may also potentially provide the main advocates for the program once the final recommendations are complete and ready to be implemented. The stakeholder groups described below are primary audiences throughout the communications process.

Targeted Audiences	Summary of Approach
Board of Supervisors	Ongoing communication with the Board of Supervisors is a critical component of the approval process for the comprehensive stormwater program. Development of proposed changes in program and funding strategy include several specific milestones at which the elected leadership will be directly engaged. Use of monthly written project summaries is one effective tool in sustaining interest and understanding by the Board of Supervisors over the next year. Briefing County Leadership on a 60-day basis will also support communication with the Board.
Citizen Advisory Committee –	Fairfax County has an established pattern of using citizen’s committees to gauge public reaction and review proposed County actions that affect citizens’ lives. The Committee plays a pivotal role in providing valuable community input on level of service and community expectations and provides a method of documenting the discussions and draft policies with residents. The Committee should be appointed by the Board with recommendations on structure from the staff. A 15 to 20 member Committee will provide sufficiently broad representation to ensure inclusiveness.





<p>The Media -</p>	<p>The news media can be a great ally to the County. When the media are educated and informed early, they are generally supportive of stormwater agencies and the utilization of user fees based on equity and program needs. With Fairfax County's wide geographic area, it is especially important to find ways to develop relationships with media in all parts of the County, especially those who are favorable to publicizing environmental stories. The County will also have to cultivate media outlets (most likely radio) that cover some of the diverse groups where English is a second language, such as the Hispanic and Asian media outlets.</p>
<p>Fairfax County Employees –</p>	<p>There are several levels of employees who should be contacted and trained throughout the course of this program. The attention paid to the employees is dependent on their role and their influence on the program. For example, senior employees and supervisors in other departments may be asked questions about the funding analysis and need to know some general information with which they can respond. STW employees need to support to the process and front-line employees, like the maintenance crews, need to be able to successfully answer questions of the public as they make their rounds. The program targets each level of internal audience to develop specific messages for internal newsletters, meetings, and training that match their levels of need.</p>
<p>Public Information Officers Within the County, Cities, and Towns within Fairfax County Limits –</p>	<p>It would be useful to build a relationship among the Public Information Officers (PIOs) of area jurisdictions, targeting them as an outlet for accurate information for their elected officials, leadership and general public. This will help limit distribution of misinformation and enable them to respond as necessary to their publics.</p>
<p>The General Public–</p>	<p>There are a number of ways to effectively engage the general public in issues that they can help control, particularly through the County's on-going program for public education and involvement. As part of this more focused and specialized outreach, however, the initial general public education should be limited to why stormwater management is important and why it should concern them. During this process, a gauge of the public's perception about stormwater issues in Fairfax County is useful and can be obtained through surveys or focus groups, gaining a greater understanding of the expectations of the public and their support for an expanded program of services to address water quality and water quantity challenges. The Citizen Advisory Committee is one way to develop the appropriate messages to the general public, using their focused input into crafting messages on program needs, policy and change.</p>

3. OVERVIEW OF THE THEMES – IT'S ALL ABOUT CHANGE

What is driving changes in the overall management of stormwater, both water quality protection and runoff controls? Answering this question is the foundation of the message that supports the changes needed, including a change in the funding strategy to ensure that expectations are met.

The message must first address why change is needed. It is the change in program or levels of services that creates the basis of understanding. Stress the goals of the expanded stormwater program and demonstrate those improvements in service are critically needed by focusing in on the expectations of the County residents. Care should be taken to focus on the environmental benefits that directly affect the County residents instead of on federal policy that is mandating the changes. It is also important to create a reasonable level of expectation about what the stormwater program can accomplish.



It is the program that must be presented and the drivers for change must make sense to the public. In summary the messages for all the public education activities should be clear and direct and should include the following themes, which highlight the program and build upon each other:

- There are drainage, water quality and other stormwater runoff needs in the County that are currently not being met and may cause flooding, stream degradation, and erosion if they are not addressed (with specific examples that are readily identifiable).
- We have a plan (program) to meet these needs that is well thought out, effective and not extravagant.
- Government must take the lead in managing stormwater for the County's benefit.
- The changes and resulting stormwater program costs more money in the short-term, but this additional investment is well worth it due to the problems that will be solved and additional expenses avoided.
- The method to generate additional revenue is fair, adequate, equitable and stable.
- There are highly visible projects as a demonstration that the program is a reality.

4. METHODS/TOOLS OF COMMUNICATION

Once the County has decided on the timing of its message, the target audience for the message, and the content of the message, we can focus on the tools for conveying the message effectively. The first opportunities will come within the first 60 days as the Stormwater Advisory Committee is formed and a decision regarding appropriate information to be shared is accumulated. Later the meetings of the Stormwater Advisory Committee and the decisions by the Board of Supervisors will provide direction. As the Buildup Phase reaches an end, potential rates are determined, the Stormwater Policy Committee provides its recommendations and the presentations to the Board of Supervisors all provide opportunities for more detailed media coverage. The following types of communication tools or methodologies are recommended for Fairfax County and are discussed in detail in Section C below.

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • Frequently Asked Questions Memos • Customer Service Staff updates • Presentations to Civic Organizations • Update of Web site • County TV Channel • NewsLink • Courier • Articles in Board of Supervisors newsletter • Create micro-site for project | <ul style="list-style-type: none"> • Monthly Summaries of Project Progress • Briefings of Board, County Leadership, staff • Policy Paper Process for Citizen Committee • News to Use • Radio spots • Weekly Agenda • Mailings to HOAs • Materials in libraries and other County facilities | <ul style="list-style-type: none"> • Multilingual publications • Community meetings • Brochure for use in presentations • Speakers Bureau • Media Summaries • News Releases • Letters to Industry • Special events, such as Fall for Fairfax |
|--|--|--|



APPENDIX I

STORMWATER MANAGEMENT BENCHMARKING REPORT

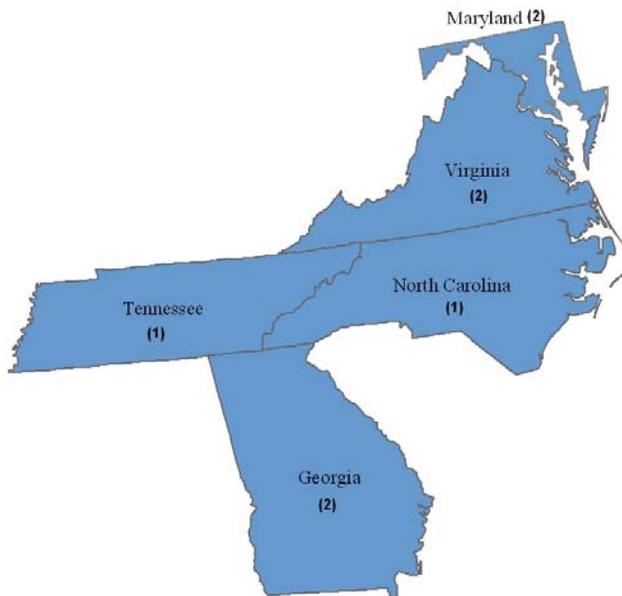
INTRODUCTION

The purpose of this stormwater management program benchmarking report is to gain a better understanding of the current state of the Fairfax County Stormwater Management Program and how Fairfax's program may compare to other major urbanized communities from around the mid-Atlantic region and the eastern United States. The desired end result of this exercise is the compilation of information on what a variety of municipal stormwater programs accomplish and how they measure or track their success. Examination of these benchmarks provides Fairfax County with a tool to measure its own programs' successes and challenges and to highlight potential programming decision points that may lead to policy and programming adjustments.

FAIRFAX COUNTY

Fairfax County is a large and diverse community located on the south shore of the Potomac River in the northern Virginia region just south and west of Washington, D.C. Fairfax has a growing population that totaled roughly 969,749 in the 2000 Census and covers approximately 399 square miles of land. The County's population projection through 2003 shows growth to 1,012,100¹, a 4.4 percent increase over the three-year period. The County's terrain can best be described as "piedmont," with a mix of rolling hills away from the Potomac shoreline and some coastal characteristics closer to the lower Potomac River, which is brackish and tidal along its Fairfax County shoreline south of the City of Alexandria. The County is comprised of 30 watershed sub-basins, which all eventually drain to the Potomac River. County staff estimates that the County is now

approximately 90 percent "built out," with only certain portions of the County remaining available for development and still other portions' sensitive watersheds protected by regulation.



Benchmarking Study Process

For purposes of this benchmarking exercise, the study examined a group of localities from the eastern United States, with a concentration on the mid-Atlantic and southeastern United States, that, in the estimation of the County staff, are reasonably representative of the conditions found in Fairfax County and will provide a defensible measuring stick

¹ Weldon Cooper Center for Public Service, 2003 Provisional Population Estimates for Virginia. February 2, 2004.



against which to benchmark the County's stormwater services. The list of communities is found in Appendix I-1. The geographic breakdown of the study area is shown above.

The survey was completed through the use of a benchmarking questionnaire that sought to measure a number of different stormwater management practices, characteristics, policies, procedures, and funding strategies. The benchmarking questionnaire used for this study is found in Appendix I-2. Information pertaining to the survey questions was collected from each community, with follow-up telephone calls made to many communities so as to clarify answers received.

Several key points about the survey process and the subsequent results shown in this report warrant comment. While the survey questionnaire sought only community specific data, several of the categories of questions and their answers are necessarily affected by conditions or political structure outside the control of a given jurisdiction. For instance, in states utilizing a home rule form of government, where the municipality has some individual latitude regarding programming and policy development, results in subsequent programming may differ from those states that utilize a "Dillon Rule" structure, whereby localities can only act up to a certain threshold without approval from the state legislature. Virginia is a Dillon Rule state. Secondly, the local City/County construction and relationship varies from state to state. In Virginia, cities are completely independent entities from the counties in which they may reside. Towns are incorporated, but do not have the independent authority of cities. In other states, such as North Carolina, cities and towns are almost always part of the overall county structure, with counties exercising a certain amount of oversight and jurisdiction over city and town activities. These organizational issues impact the way in which local governments administer their municipal stormwater management program.

In addition to the overarching impacts of state and local governmental structure and function, other assumptions and assertions have been made in this survey to address like issues and options. As witnessed through the questionnaire in Appendix I-2, the survey sought fairly detailed information from the selected communities relating to specific operations, maintenance, regulatory compliance, and capital improvement programming. Each community's response differed based on the exact types of activities and priorities addressed in that particular jurisdiction. As such, the consulting team gathered the responses and categorized those responses as consistently as possible to capture the broader conclusions offered from the data.

In order to organize the results in a way that facilitates report presentation, the questions included in this survey have been cataloged into four broad categories:

- **Basic Data:** including demographic, topographic, hydrologic, and land use characteristics;
- **Program Data:** including a number of topics related to services provided by the communities examined, including regulatory programming, operational services and policies, and capital improvement programming;
- **Physical System Data:** including an inventory of the system that the participating communities manage, as well as some of the physical characteristics of that system;
- **Budget and Funding Data:** including community budget allocations for stormwater services as well as community funding approaches for those services.



A summary of the results of the surveyed data from each of these categories follows.

BASIC DATA

The jurisdictions surveyed for the benchmarking study all share certain characteristics and features, as well as certain unique conditions. The following tables, charts and discussion demonstrate the basic characteristics of the surveyed communities as well as those same characteristics for Fairfax County.

Basic Data tables and charts include:

- Population and population served by community stormwater management program
- Area of jurisdiction in square miles
- Annual precipitation
- Physiographic regions (riverine, tidal, etc...)
- Land cover characteristics

PROGRAM DATA

Each of the jurisdictions surveyed provide some level of stormwater management services to their citizenry. The survey questionnaire detailed a number of programmatic activities that define a typical municipal stormwater management program. Broader definitions of program areas assessed include Customer Service, Erosion and Sediment Control, Floodplain Management, Dam Safety, Roadway Drainage, Inspection Services, Capital Improvement Program, Environmental Mandates, Watershed Management, Geographic Information Systems (GIS), and GASB 34 Asset Valuation. Table 4 presented below demonstrates the range of programmatic activity, by category, for each of the studied jurisdictions.

PHYSICAL SYSTEM DATA

Each of the jurisdictions polled for this survey manage a unique physical stormwater management system. Some deal with more closed pipe systems, others with more open channels and ditch systems, usually depending on topography and historical land development patterns. In addition, each jurisdiction utilizes a variety of stormwater best management practices (BMPs) to manage stormwater impacts, both quality and quantity. Among the common themes that evolved through research on physical system inventories, one of the most common was the difference in the way communities tracked or attributed system data. For instance, some communities track stream miles only in terms of the stream mileage listed on their respective FEMA Flood Insurance Studies and Flood Insurance Rate Maps. Other communities classify stream miles by the number of miles of perennial stream found in the community, often utilizing a different regulatory definition. Finally, and perhaps most importantly, the task of tracking and updating a given community's stream and stormwater system is daunting. Many of the communities polled, even those with fairly progressive stormwater management programs, do not necessarily have an accurate accounting of their physical infrastructure.

The task of gathering and managing that information continues to prove difficult. Some communities polled could provide accurate data on their physical system, others could not. However, the survey did demonstrate that among the jurisdictions polled, almost all noted the existence of both closed (i.e. piped) and open (i.e. ditched) stormwater



conveyance systems. In addition, of the communities that responded with specific data about BMPs in use, a wide variety of practices were listed. BMPs typically employed in the studied communities included the following:

- Oil/Grit Separators
- Infiltration facilities
- Wet ponds
- Underground storage facilities
- Filtration Devices
- Dry ponds
- Extended detention facilities
- Low Impact Development practices (i.e. rain gardens)

FUNDING AND BUDGET DATA

The level of service provided for physical infrastructure maintenance, stormwater management planning, regulatory compliance, and capital construction and improvement programs in each of the surveyed jurisdictions can be traced directly to the amount each community budgets for stormwater-related service and the availability of funding to provide those budgeted dollars. Table 6 details the budget information and per capita spending of each community surveyed.

The surveyed communities receive funding from various sources such as the general tax fund, stormwater taxes, user fees, permit fees, pro rata shares and other fees. Table 7 summarizes the funding mechanism data.



APPENDIX I-1

The communities in the Benchmarking Study are:

- Prince Georges County, MD
- Montgomery County, MD
- Cobb County, GA
- Fulton County, GA
- Charlotte-Mecklenburg County, NC
- Nashville-Davidson County, TN
- Chesterfield County, VA
- City of Virginia Beach, VA





APPENDIX I-2

SURVEY QUESTIONNAIRE

Basic Data:

1. Population of jurisdiction – total:
2. Population of area served (total plus/less any incorporated areas or other jurisdictions served/not served by County if appropriate):
3. Area of jurisdiction: total area
4. Area served by stormwater program (square miles)
 (identify area of other jurisdictions served, if appropriate)
 (identify unincorporated area served, if appropriate)
5. Precipitation (annual average)
6. Topography (i.e., riverine, tidal, coastal, piedmont, mountainous)
7. Land use by category: (in percent of total area)
 - Commercial retail
 - Office park
 - Warehouse
 - Industrial
 - Open space
 - Park land (if tracked separately)
 - Conservation land
 - Residential – single family
 - Residential – multifamily

Program Data:

1. Identify services provided

Program Area	Yes No	Quantity/Frequency	Public System	Private System
SW Plan Review				
SW Facilities Inspections				
Floodplain management				
NPDES Permit (date of issuance – can we have a copy?)				
TMDLs (give purpose)				
Watershed management strategy – mandated				
Water quality monitoring: biological/ chemical/ physical				
Public education program				
Public involvement program				



(inserts/sand filters, etc)		
WQ Structures - constructed (permanent wet facilities, ponds etc.)		
WQ Structures - constructed (dry ponds, LID facilities, rain gardens, green roofs)		
Stream miles		
Open systems (ditch, man-made channels)		

4. Best Management Practices Authorized/Allowed (Identify type)
5. Do you have policies/design standards/design manual for authorized BMPs? Are they available on web? Can we get a copy?
6. Maintenance policies:
 - a. Internal policies or standards for maintaining system? Can we get a copy? Do your policies address small scale BMP maintenance (LID measures, i.e. rain gardens) on individual lots?
 - b. Are there standard of performance for Privately owned drainage system features? Do you have agreements in place? Are standards enforced? What enforcement procedures do you utilize?
7. Do you have an infrastructure replacement schedule or policy? How did you establish it?
8. General age of drainage system?
9. Do you have a CIP program? If yes:
 - a. how many years are projected in the plan?
 - b. what is the dollar value projected for year year?
 - c. do you have a prioritization plan or policy with rating factors? Can we obtain a copy?
10. Funding:

Primary: General Fund, Utility for stormwater (user fee), bonds for capital improvements
 Secondary: Impact fees, developer fees, plan review fees, system development charges, inspection fees

If you have a utility, what is the rate structure? When was the utility created? What is the annual revenue generated? What other revenues are included in utility structure (grants/fees/General Fund)? How are residential and non-residential units handled in your utility rate structure?

If you have a utility, how do you deliver the bill to the customer? Frequency of bill cycle?



What key political, legal, and technical issues resulted before/during/after utility implementation, if any?

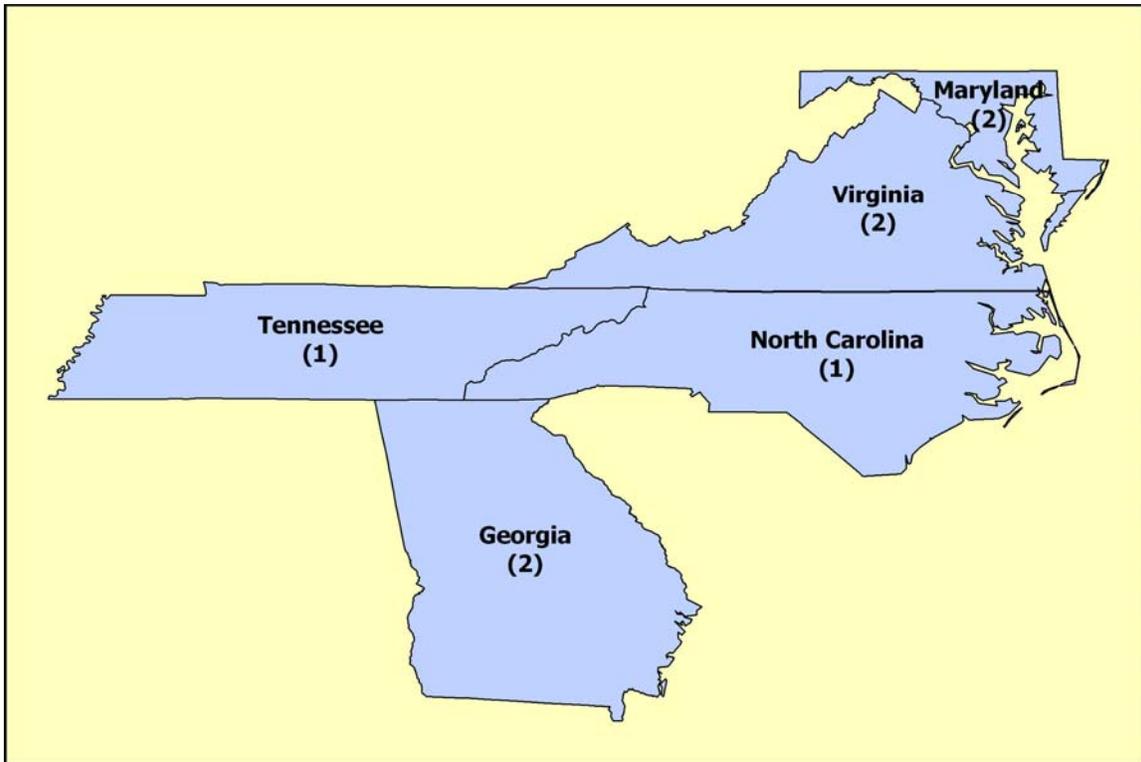


APPENDIX I-3

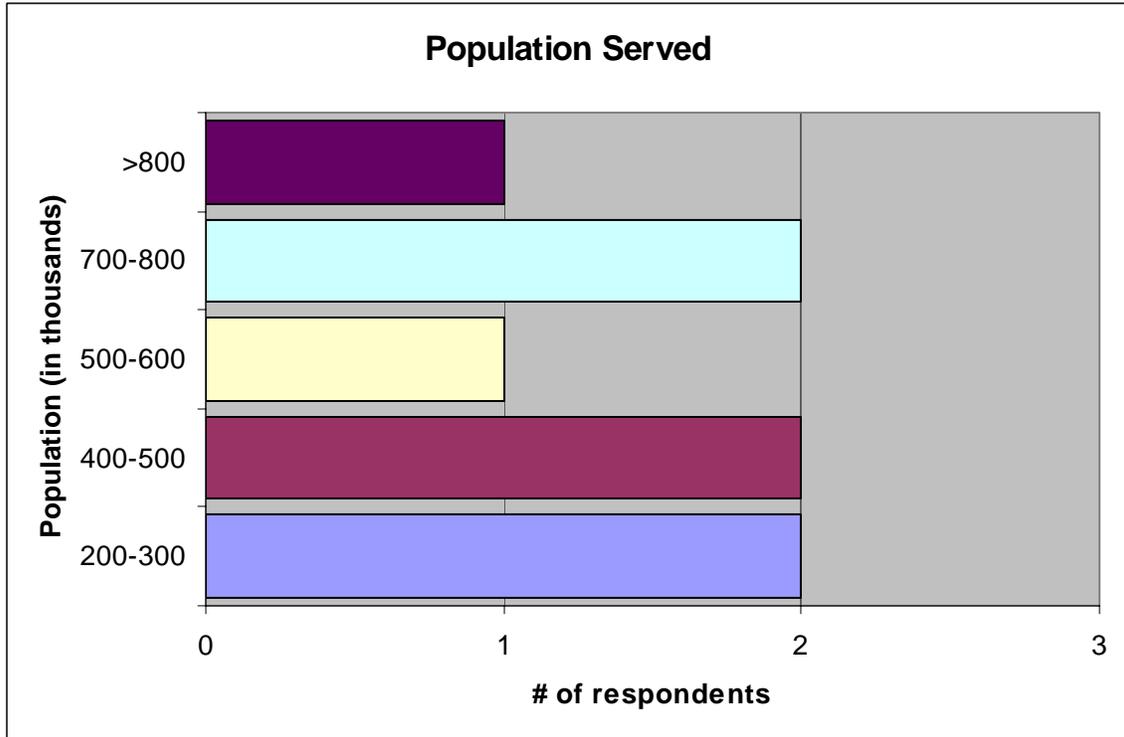
TABLES AND GRAPHIC REPRESENTATION OF DATA

DEMOGRAPHIC INFORMATION

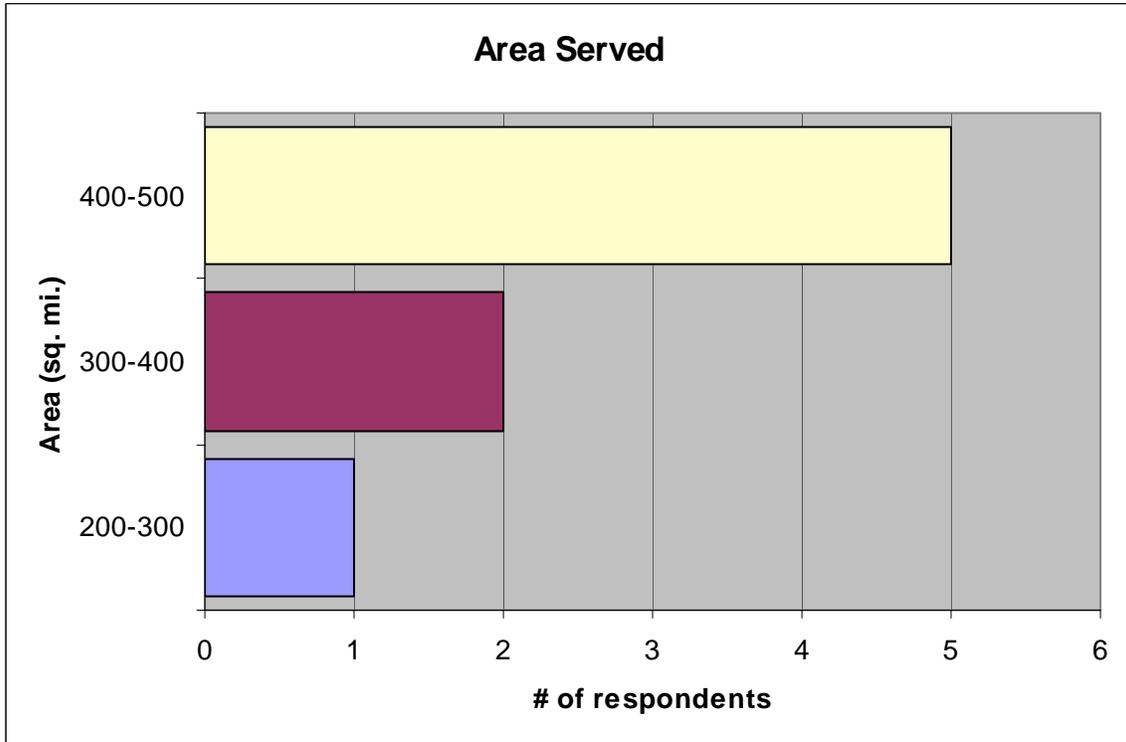
There were a total of eight respondents to the Stormwater Management Benchmarking Survey. The respondents were all from the Southeastern United States. The number of responding municipalities from each of the states is depicted in the map below. The responses in this survey do not include Fairfax County data.



The size of the municipalities included in the survey varied in size. The following graph depicts the different ranges of the population served by the different Stormwater Organizations. The range of populations was from a minimum of 231,370 to a maximum of 826,000. The population served for Fairfax County is 997,600.

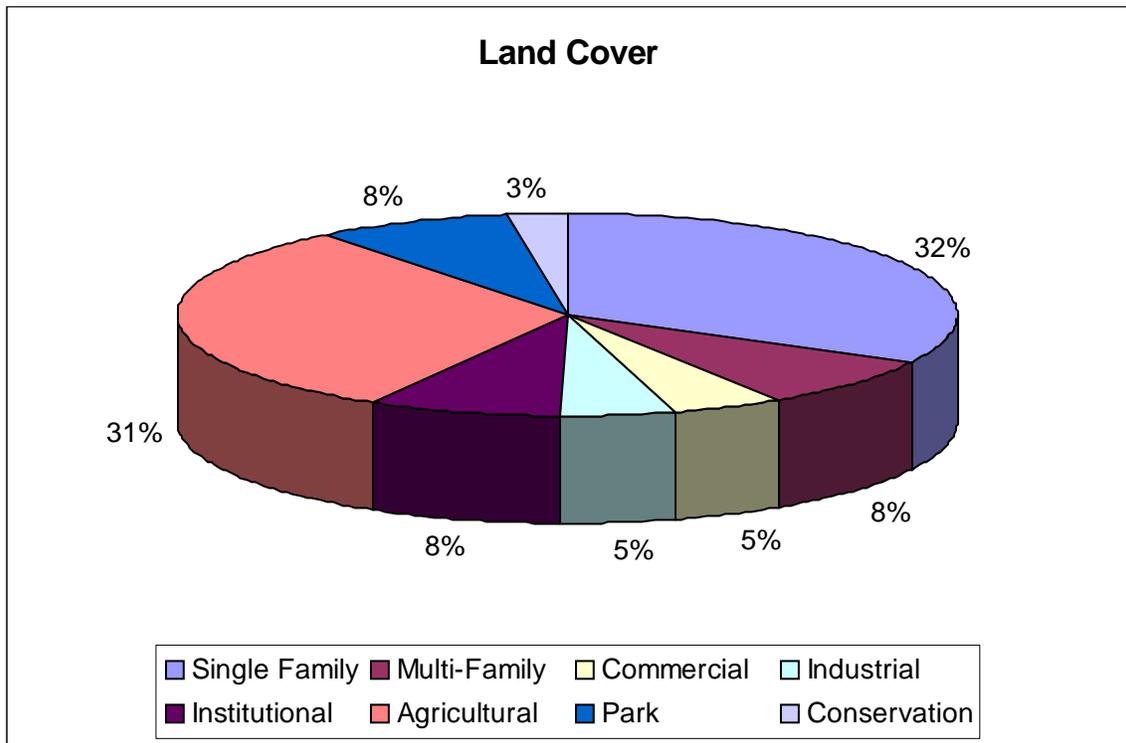


Below is a graph depicting the different sizes of the area served by the different Stormwater communities. The range of areas served varied from a minimum of 281 square miles to a maximum of 497 square miles. The service area for Fairfax County is 378 square miles.



Land Use

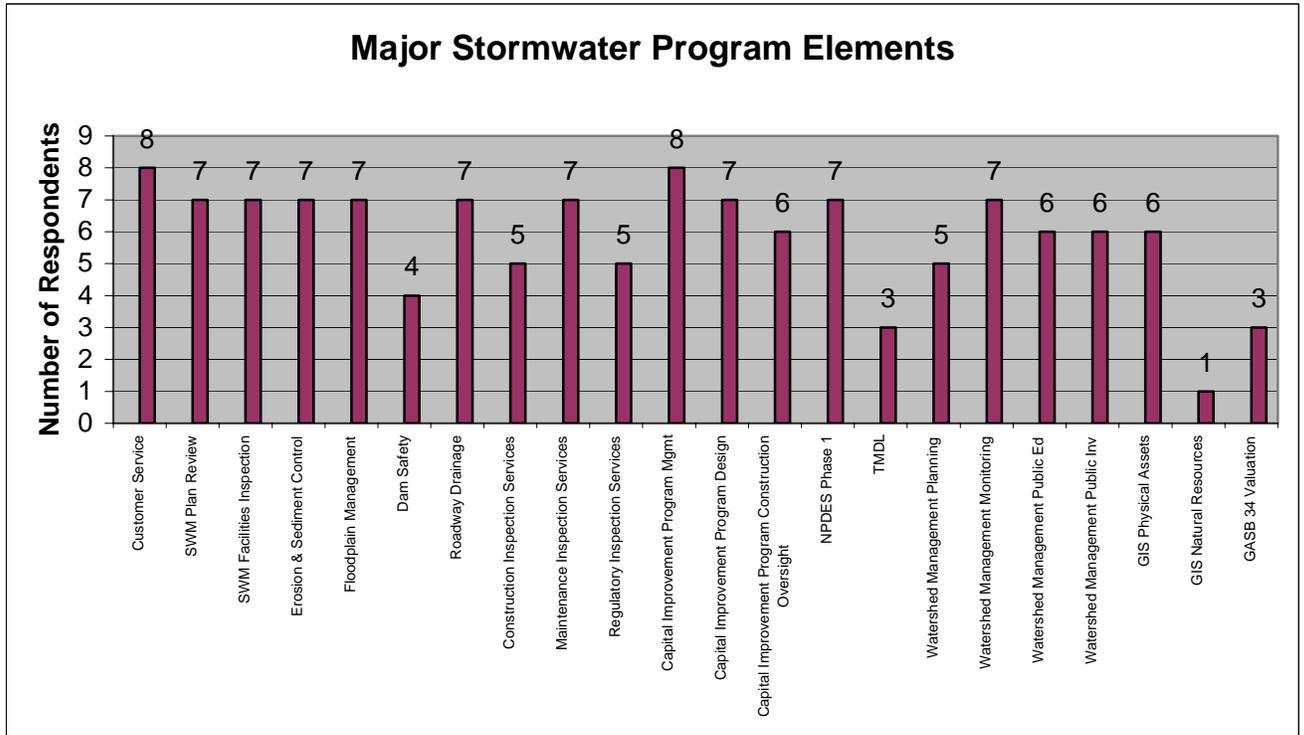
Below is a graph depicting the different average land covers for the respondents. The greatest land cover, on average, was for single-family development and the smallest land cover, on average, was for conservation.





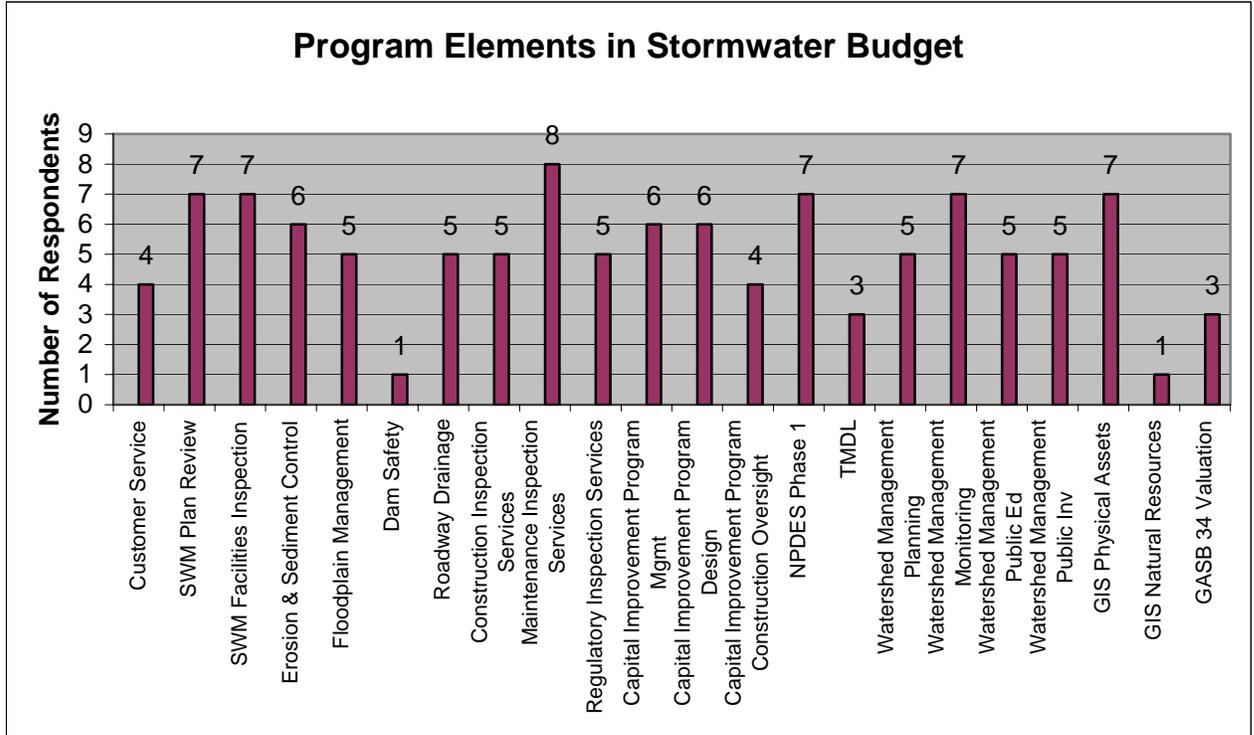
Major Stormwater Program Elements

The graph below depicts the number of respondents that include each Major Stormwater Program Element in their list of provided services. All eight respondents provide a Customer Service Function and Capital Improvement Program Management. However, only one respondent captures Natural Resources in their GIS. Fairfax County includes all 22 Stormwater Program Elements except Roadway Drainage and Natural Resources in their GIS.



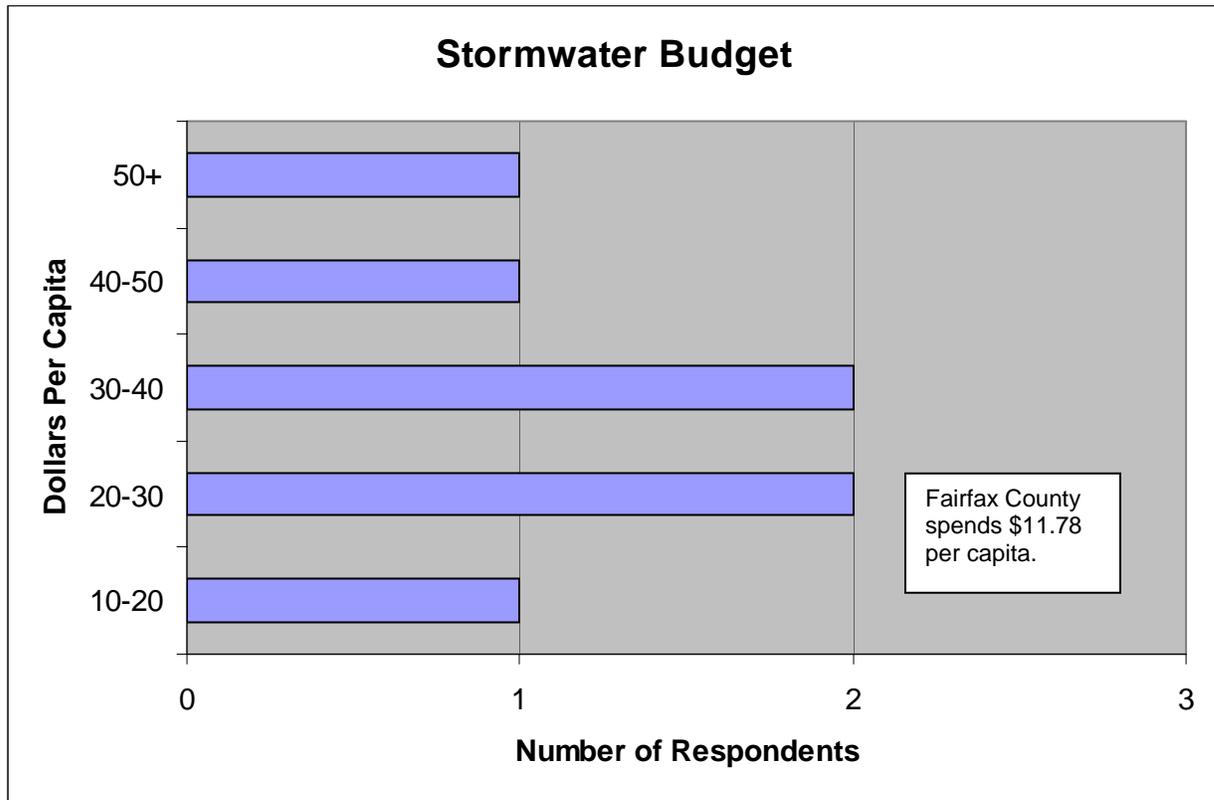
Program Elements in Stormwater Budget

The graph below depicts the number of respondents that include each Major Stormwater Program Element in the Stormwater Budget. All eight respondents include the cost of Maintenance Inspection Services in the Stormwater Budget. However, only one respondent includes the cost of their Dam Safety Program and includes Natural Resources in their GIS. Of the 20 Stormwater Program Elements provided by Fairfax all are included in the Stormwater Budget except Customer Service.



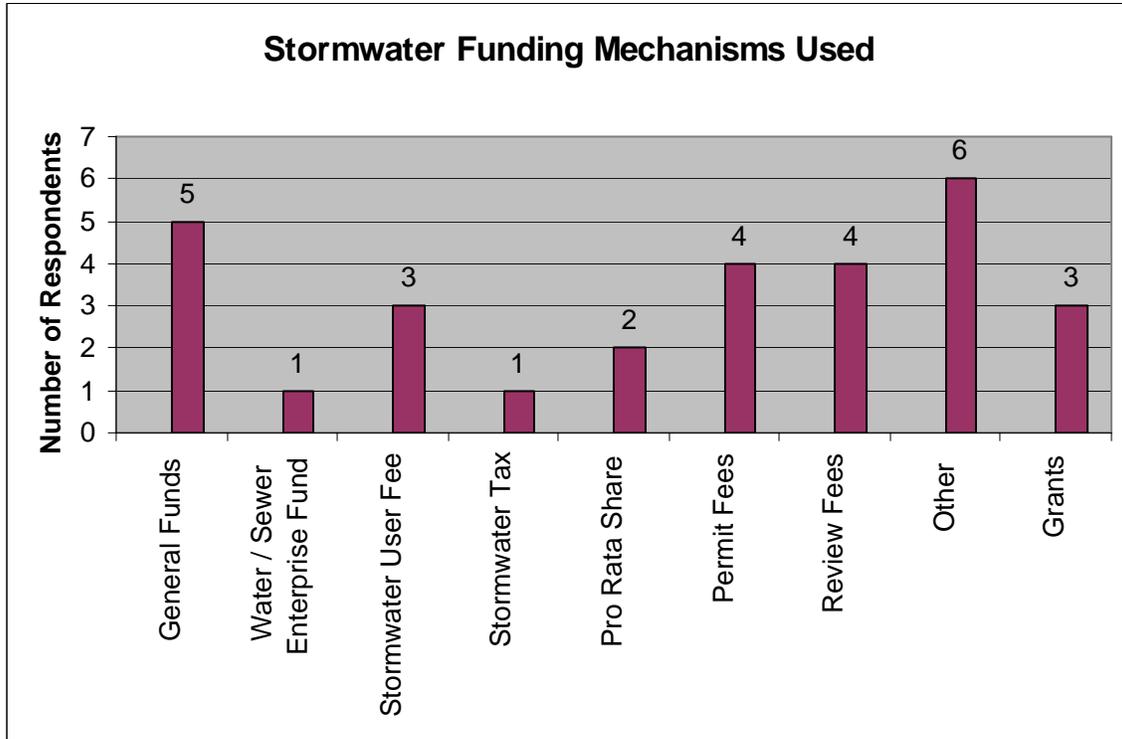
Stormwater Program Per Capita Expenditure

Below is a graph depicting the per capita expense of the Stormwater Program for the respondents. The range of expenses was from a minimum of \$13.88 per capita to a maximum of \$50 per capita. The expenses for Fairfax County are \$11.78 per capita. One community reported a per capita expense of only \$3.97; however this expense only included maintenance activities and watershed planning and this information is not included in the graph below



Stormwater Funding Mechanism

Below is a graph depicting the funding mechanisms used by the respondents for stormwater programs. Only two respondents relied solely on one funding mechanism. One relies on a Stormwater User Fee and one relies only on General Funds. It should be noted of the eight respondents three have a Stormwater User Fee in place and two are considering a Stormwater User Fee.



APPENDIX I-4

The following pages summarize the information provided by each of the eight respondents.

Virginia Beach, Virginia (Community ID #1)

Virginia Beach is located in Riverine, Tidal and Coastal Physiographical Regions in southeast Virginia, contiguous to the Chesapeake Bay. It has a population of 435,000 that resides in an area over 406 square miles.

Major Stormwater Program Elements (Table 4):

- Customer Service
- Stormwater Management: Facilities Inspection
- Erosion and Sediment Control
- Floodplain Management
- Dam Safety
- Roadway Drainage
- Inspection Services: Maintenance and Regulatory
- Capital Improvement Program: Management, Design,
- NPDES Phase I
- TMDL
- Watershed Management: Planning, Water Quality Monitoring, Public Education, Public Involvement
- GIS: Physical Assets

Virginia Beach does not provide Stormwater Management Plan Review, Inspection Services for Construction, CIP Construction Oversight, or GASB 34 Valuation, all of which are provided by Fairfax County.

Virginia Beach has a stormwater budget of \$17,465,800.

- Public System Components:
 - Roadside Ditches
 - Off Road Ditches

The Virginia Beach CIP program includes road drainage, master planning, water quality, and dam safety projects.

Virginia Beach utilizes a Stormwater Utility Fee and Other Fees to fund stormwater programs. They implemented their Stormwater Utility Fee in July 1993. It is currently a separate bill, but will be merged with the water/sewer bill in August 2004. The Utility Fee is based upon the Equivalent Residential Unit (ERU = 2,269 square feet). Each SFR is charged one ERU. NSFR and Non-residential are charged by amount of impervious surface. Roughly 26% of their other funding coming from VDOT road maintenance.



Chesterfield County, Virginia (Community ID #2)

Chesterfield County is located in Riverine, Tidal and Piedmont Physiographical Regions in central Virginia. It has a population of 284,000 that resides in an area of over 440 square miles.

Major Stormwater Program Elements (Table 4):

- Customer Service
- Stormwater Management: Plan Review and Facilities Inspection
- Erosion and Sediment Control
- Floodplain Management
- Dam Safety
- Roadway Drainage
- Inspection Services: Construction, Maintenance and Regulatory
- Capital Improvement Program: Management, Design, and Construction Oversight
- NPDES Phase I
- TMDLs
- Watershed Management: Planning, Water Quality Monitoring, Public Education, Public Involvement
- GIS: Physical Assets

Chesterfield County does not provide GASB 34 Valuation, which is provided by Fairfax County.

Chesterfield County has a stormwater budget of \$3,941,000.

Public System Components:

- Ponds
- WQ Structures: Mechanical – Sand Filters
- WQ Structures: Constructed – Wet ponds, wet marshy bottom ponds, dry detention ponds, rain gardens, Filterra Units
- Stream Miles

Private System Components:

- Commercial ponds
- Underground storage units.
- One storm filter

Chesterfield County allows very few BMP types due to high groundwater and aquatic weeds (water mill). They strongly discourage the use of high maintenance BMPs in residential areas. They have a strong emphasis on ponds. Chesterfield follows the Virginia State BMP manual. Residential BMPs are maintained by the County after certification of proper construction. Commercial BMPs are certified after construction and require three year inspection reports that are certified by a professional engineer. If they are not maintained, then the County fixes them and places a lien on the property.

Chesterfield County uses \$200,000 from CIP each year; this funding level is “guaranteed” by the County Board in lieu of a stormwater utility. They also spend \$200,000 annually on stream restoration.



Chesterfield County utilizes General Funds, Pro Rata Share, Permit Fees, Review Fees, and Other Fees to fund stormwater programs. They place a strong emphasis on cost recovery for plan review and related services. The proposed stormwater utility fee was viewed as a “rain tax” by the public; therefore, the County Board created a “guaranteed CIP fund.”

Montgomery County, Maryland (Community ID #3)

Montgomery County is located in the Piedmont Physiographical Region to the north of Washington DC. It has a population of 873,300 that resides in an area of 496 square miles.

Major Stormwater Program Elements (Table 4):

- Customer Service
- Stormwater Management: Plan Review and Facilities Inspection
- Erosion and Sediment Control
- Floodplain Management
- Dam Safety
- Roadway Drainage
- Inspection Services: Construction and Maintenance
- Capital Improvement Program: Management, Design, and Construction Oversight
- NPDES Phase I
- Watershed Management: Planning, Water Quality Monitoring, Public Education, Public Involvement.
- GIS: Physical Assets
- GASB 34 Valuation

Montgomery County does not have TMDLs, which are monitored in Fairfax County.

Montgomery County has a stormwater budget of \$3,276,150.

Public System Components:

- 765 Dry Ponds
- 353 Wet ponds
- 353 Filtration Systems
- 616 Infiltration Systems
- 1,033 OW separators
- 294 underground detention structures
- 259 other BMPs

Private System Components:

- Commercial: 255 dry ponds, 92 wet ponds, 140 Filtration Systems, 537 separators, 215 underground detention structures, 77 other
- Residential: 342 dry ponds, 144 wet ponds, 161 filtration, 89 infiltration, 187 separators, 26 underground, 141 other.
- Parks and Planning: 86 dry ponds, 42 wet ponds, 9 filtration, 95 infiltration, 29 separators, 20 underground, 13 other.



- Schools: 26 dry ponds, 4 wet ponds, 16 filtration, 83 infiltration, 129 separators, 29 underground, 9 other.
- Government: 39 dry ponds, 53 wet ponds, 10 filtration devices, 43 infiltration, 123 separators, 7 underground, 12 other.
- Unknown: 17 dry ponds, 18 wet ponds, 17 filtration, 12 infiltration, 28 separators, 5 undergrounds, 7 others.

Montgomery County follows the State of Maryland BMP Design Manual and the Prince Georges County LID manual. The County will not maintain small structures on individual lots unless the County deems on an individual basis that it would be important enough (like a school or other private institution). They do not have standards of performance for privately owned drainage systems. They do have regulations that require maintenance through easements and covenants.

The average age of stormwater facilities is 15-20 years. No other CIP information is recorded.

Montgomery County utilizes a Water Quality Protection Charge to fund stormwater programs. The State enabling legislation allows a system of charges. The charge is based on an ERU of 2,406 square feet (sidewalk, driveway, and rooftop); the initial rate was \$12.75 per annum. Associated non-residential properties are based on imperviousness as well as multi-family and condos, and others. Townhomes are based on 1/3 of square feet rate or \$4.24. The Charge generates \$2.8 million annually, with all of the funds dedicated for stormwater facility maintenance program and street sweeping. While some money goes to maintain stream restoration projects, no money goes to the CIP to actually build projects.

Prince Georges County, Maryland (Community ID #4)

Prince Georges County, Maryland is located in Coastal and Riverine Physiographical Regions to the north of Washington DC. It has a population of 833,100 that resides in an area of over 485 square miles.

Major Stormwater Program Elements (Table 4):

- Stormwater Management: Plan Review
- Erosion and Sedimentation Control
- Floodplain Management
- Inspection Services: Regulatory
- Capital Improvement Program: Management, Design, and Construction Oversight
- Watershed Management: Planning, Water Quality Monitoring, Public Involvement

Prince Georges County does not provide the following elements, all of which are provided by Fairfax County:

- Customer Service
- Stormwater Management: Facilities Inspection
- Dam safety
- Inspection Services: Construction and Maintenance
- NPDES Phase I
- TMDL



- Watershed Management: Public Education
- GIS: Physical Assets
- GASB 34 Valuation

Prince Georges County has a stormwater budget of \$26,254,600.

Public System Components:

- 500 ponds

Private System Components:

- Approximately 15,000 ponds

Prince Georges County uses the State of Maryland BMP manual and regulations; this manual only addresses water quality, so the County has its own manuals for LID and flood control.

LID on individual lots is maintained by the individual property owner; the County also holds maintenance agreements, easements, and rights of ways.

The County is spending about \$1 million of CIP funds on flooding each year. The estimated cost to remediate all known flood control problems is \$160 million. The County prioritizes mostly by flooding potential, frequency, etc. The flood control program was scaled back recently in favor of stream restoration.

Prince Georges County receives funding from several sources, including General Funds, the Stormwater Tax, Pro Rata Share, Permit Fees, Review Fees, and Grants. The largest source is the Stormwater Tax; it is actually a tax and is based on property value. However, it does go into an enterprise fund and can only be used for stormwater. There are two districts that have different rates. The first, which is 90% of the County, is at a rate of \$0.135/\$100 value. It doesn't matter if the property is residential or commercial. The second district is a strip of more rural area along the Patuxent River, which is taxed at \$0.03/\$100 value. Most of the latter goes to water quality improvement. The \$0.135 rate was set in 1987 and hasn't changed, although it may expand in near future. The \$0.03 rate went into affect in 1995 -- there was no tax in this area prior to that. The original taxing district followed the old WSSC boundaries. Another major source of funding comes from cost share grants. The County receives about \$2 to \$3 million a year for flood control and water quality improvements from State and federal sources. For instance, the County recently received \$6 million for LID retrofit from the USEPA. The County is an attractive place for the State and federal government to go because the County usually is able to come up with the cost share. Review fees generate \$1 to \$2 million per year. There is also a fee in lieu system that generates about \$1 million per year. Another very unique feature is that the County has an automated floodplain modeling tool. The County provides floodplain determination services to the development community -- which raises about \$250,000 per year. This money is used to pay for GIS staff and computer model updates. The billing system is integrated into the real property tax bill.



Cobb County, Georgia (Community ID #5)

Cobb County is located in the Piedmont Physiographical Region in northern Georgia. It has a population of 607,800 that resides in an area of over 345 square miles.

Major Stormwater Program Elements (Table 4):

- Customer Service
- Stormwater Management: Plan Review and Facilities Inspection
- Erosion and Sedimentation Control
- Floodplain Management
- Dam Safety
- Roadway Drainage
- Inspection Services: Construction, Maintenance and Regulatory
- Capital Improvement Program: Management, Design, and Construction Oversight
- NPDES Phase I
- Watershed Management: Water Quality Monitoring, Public Education
- GIS: Physical Assets
- GASB 34 Valuation

Cobb County does not provide Watershed Management: Planning and Public Involvement, which are provided by Fairfax County

Cobb County has a stormwater budget of \$10,700,000.

Public System Components:

- Pipe
- Ponds
- Catch basins/inlets
- WQ Structures: Mechanical and Constructed

Private System Components:

- Catch Basin/inlets

Cobb County uses the Georgia Soil & Water Conservation Commission Field Manual for BMP standards.

CIP funds are only used for floodplain acquisition.

Cobb County has several funding sources. The primary fund is the water/sewer fund. The secondary funds are grants and the General Fund. Cobb County is considering the application of a Stormwater User Fee.



Fulton County, Georgia (Community ID #6)

Fulton County is located in the Piedmont Physiographical Region of north central Georgia. It has a population of 816,000 that resides in an area of over 529 square miles. It is contiguous to Atlanta, the state capital. The area serviced by Fulton County stormwater services does not include several major municipalities including Atlanta, Alpharetta, and College Park. The actual service population is estimated at 231,300.

Major Stormwater Program Elements (Table 4):

- Customer Service
- Stormwater Management: Plan Review, Facilities Inspection
- Erosion and Sedimentation Control
- Floodplain Management
- Roadway Drainage
- Inspection Services: Construction and Maintenance
- NPDES Phase I
- TMDLs for fecal coliform and sediments.
- Watershed Management: Planning, Water Quality Monitoring, Public Education, Public Involvement.
- GIS: Physical Assets, Natural Resources
- GASB 34 Valuation

Fulton County does not provide Dam Safety, Inspection Services: Regulatory, and Capital Improvement Program: Management, Design, and Construction Oversight, all of which are provided by Fairfax County:

Fulton County has a stormwater budget of \$8,600,000

Public System Components:

- Pipe
- A limited number of detention ponds,
- Catch basins/inlets.

Private System Components:

- Does not manage any other private systems.

Fulton County allows the use of wet detention basin and hydrocarbon removal system BMPs. The maintenance standards are currently being developed. They do not have policies in place for the maintenance of small scale BMPs on individual lots. Privately owned drainage systems do not have performance standards, and are inspected only when violations are reported.

Fulton County does not have a CIP program currently in place.

Fulton County uses the General Fund as its primary source of funding stormwater projects. They are currently attempting to create a stormwater utility fee; they anticipate using a bi-monthly billing system using the existing water bill.



City of Charlotte and Mecklenburg County, North Carolina (Community #7)

The City of Charlotte and Mecklenburg County are located in the Piedmont Physiographical Region of North Carolina, near the center of the state. It has a population of 695,500 that resides in an area of over 526 square miles.

Major Stormwater Program Elements (Table 4):

- Customer Service
- Stormwater Management: Plan Review and Facilities Inspection
- Erosion and Sedimentation Control
- Floodplain Management
- Roadway Drainage
- Inspection Services: Construction, Maintenance and Regulatory
- Capital Improvement Program: Management, Design, and Construction Oversight
- NPDES Phase I
- TMDL
- Watershed Management: Water Quality Monitoring, Public Education, Public Involvement.
- GIS (city only): Physical Assets, Natural Resources
- GASB 34 Valuation (city only)

The City of Charlotte and Mecklenburg County do not provide Dam Safety, which is provided by Fairfax County.

The City of Charlotte and Mecklenburg County have a stormwater budget of \$35,000,000.

Public System Components:

- Pipe
- Ponds
- Catch basins/inlets
- WQ Structures (only if they serve a public good)
- 330 FEMA miles, 4000 total miles of perennial and intermittent stream

Private System Components:

- Pipe
- Ponds
- Catch Basin/inlets
- WQ Structures are repaired, but then the owner must maintain the repairs

The City of Charlotte and Mecklenburg County uses BMPs within the water supply watershed for erosion and sediment control. They follow the Town of Huntersville NC LID policy. The County is responsible for maintaining the FEMA designated floodplain. If the County must repair a failed private system, then it will maintain an easement.



The CIP is projected to 2008.

2004:\$30.5M	2006:\$36M	2008:\$37.5M
2005:\$34M	2007:\$37M	

The City of Charlotte and Mecklenburg County fund stormwater programs through a Stormwater Utility Fee, Permit Fees, Review Fees, Other Fees, and Grants.

- ◆ The Stormwater Utility Fee generates roughly \$26 million per year.
- ◆ A two tiered rate structure is employed (\$4.58 for < 2000 square feet, and \$5.91 for > 2000 square feet).
- ◆ NSFR are billed by ERU (ERU = 2613 square feet).
- ◆ The Stormwater Utility Fee is billed monthly and is integrated into the water bill.

City of Nashville and Davidson County, Tennessee (Community ID #8)

The City of Nashville and Davidson County are located in the Piedmont physiological Region of central Tennessee. It has a population of 570,000 that resides in an area of over 533 square miles.

Major Stormwater Program Elements (Table 4):

- Customer Service
- Stormwater Management: Plan Review and Facilities Inspection
- Erosion and Sedimentation Control
- Floodplain Management
- Roadway Drainage
- Inspection Services: Maintenance
- Capital Improvement Program: Management, Design, and Construction Oversight
- NPDES Phase I community
- TMDL
- Watershed Management: Water Quality Monitoring, Public Education, Public Involvement.
- GIS: Physical Assets and Natural Resources
- GASB 34 Valuation

The City of Nashville and Davidson County do not provide Dam Safety, Inspection Services: Construction and Regulatory, or Watershed Management Planning, all of which are provided by Fairfax County.

The City of Nashville and Davidson County has a stormwater budget of \$14,000,000.

Public System Components:

- Closed System Pipes
- Open Channel Culverts
- Catch basins/inlets
- Inlets
- Outfalls



- Detention Ponds
- Open Systems (ditch, man-made channels)
- Stream Miles
- Stormwater Quality BMPs

BMPs are required for all new construction sites with a grading permit (disturbing 10,000 square feet or greater). A BMP guidance manual is provided but no specific BMPs are required. Generally, the developer can pick and choose BMPs at will and they will be approved without scrutiny. The Metropolitan Nashville and Davidson County Stormwater Management Manual Volume 4: Stormwater Best Management Practices (BMP) Manual is used to set BMP standards. Private detention facilities and water quality BMPs have maintenance agreements in place. Performance standards are usually not enforced.

The CIP program includes routine maintenance, remedial maintenance, and capital projects privatized and performed by contractors. It is projected out to three years plus "out years". The CIP has the following projected values:

2005: \$5.12M,
2006: \$5.62M

2007: \$1.37M,
"Out Years": \$3.32M

The City of Nashville and Davidson County uses General Funds, Permit Fees, Review Fees and Other Fees to fund stormwater programs.





APPENDIX I-5

The following tables summarize the raw data received from the surveyed communities.

Table 1: Community Key Index

Community	<i>Multi-Jurisdictional</i>	Community ID
Virginia Beach, Virginia	N	1
Chesterfield County, Virginia	N	2
Montgomery County, Maryland	Y	3
Prince Georges County, Maryland	Y	4
Cobb County, Georgia	N	5
Fulton County, Georgia	N	6
City of Charlotte and Mecklenburg County, North Carolina	Y	7
City of Nashville and Davidson County, Tennessee	Y	8





Table 2: Basic Community Data

Community ID	Population ²		Area (mi ²)		Annual Precip (in)	Physiographic Region(s)				
	Total	Served by SWP	Total	Served by SWP		Riverine	Tidal	Coastal	Piedmont	Mountain
FFX CO	997,600	997,600	406	378	44.0	X		X		
1	435,000	435,000	312	312	45.1			X		
2	284,000	284,000	440	440	43.5	X	X		X	
3	873,300	826,000	496	483	43.1				X	
4	833,100	782,815	485	469	43.8	X		X		
5	607,800	455,100	345	281	54.0				X	
6	816,000	231,300	529	304	49.0				X	
7	801,000	700,000	526	447	43.1				X	
8	570,000	545,000	533	497	49.5				X	
Community ID	Comments									
FFX	Does not include incorporated towns (Herndon, Vienna)									
1	Independent City.									
2	Unincorporated County.									
3	Does not include towns/cities within the County.									
4	Does not include towns/cities within the County.									
5	Does not include towns/cities within the County.									
6	Does not include towns/cities within the County (Atlanta, College Park, East Point, Mountain Park, Alpharetta, Roswell, Fairburn, Union City, and Palmetto).									
7	Includes Charlotte and unincorporated areas of Mecklenburg County, NC.									
8	Includes the City of Nashville and unincorporated areas of Davidson County, TN.									

² Population numbers are for 2002, except Fulton County which is 2000.





Table 3: Land Cover (Percentage of Area)

Community ID	Residential		Developed / Non-Residential			Open Space			Other	Total
	Single Family	Multi-Family	Commercial	Industrial	Institutional	Agricultural	Park	Conservation		
FFX	43	8	5	3	10		12		19	100
1	24	16	4	1	21	34			0	100
2	34	1	2	4	7				52	100
3	44	2	2	1		34				83
4	17	3	2	2	14		4	4	47	93
5	55	3	5	2	2		19		6	92
6	29	2	3	3	2	11	1	1	48	100
7	18	29	12	21					20	100
8	34		8	4	2	42			10	100
Community ID	Comment									
FFX	Other represents other open space									
1										
2	Institutional land uses include large public parks and open space. Other included vacant land and water.									
3										
4	Other (47%) includes forested lands. Unaccounted for land area is primarily transportation infrastructures									
5	Parks (19%) is a sum of all open space uses. Other is limited access, quarries, TCU, transitional, and other urban and water.									
6	Other is a sum of 40.5% forest land, 1.5% golf courses, 3%(limited access, quarries, TCU, transitional, and other urban) & 3% water.									
7	Other is a sum of 14% vacant land and 6% other (undetermined use)									
8										





Table 4: Major Stormwater Program Elements

Program Area		Community ID								
		FFX CO	1	2	3	4	5	6	7	8
Customer Service		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Stormwater Management	Plan Review	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Facilities Inspection	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Erosion & Sediment Control		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Floodplain Management		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dam Safety		Yes	Yes	Yes	Yes		Yes	No	No	No
Roadway Drainage			Yes	Yes	Yes		Yes	Yes	Yes	Yes
Inspection Services	Construction	Yes		Yes	Yes		Yes	Yes	Yes	
	Maintenance	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
	Regulatory	Yes	Yes	Yes	No Data	Yes	Yes	No	Yes	
Capital Improvement Program	Management	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Design	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Construction Oversight	Yes		Yes	Yes	Yes	Yes	No	Yes	Yes
Environmental Mandates	NPDES Phase 1	Yes	Yes	Yes	Yes	No Data	Yes	Yes	Yes	Yes
	NPDES Phase 2				No Data		N/A	N/A	Pending	
	TMDL	Yes		Yes			No Data	Yes	Yes	Yes
Watershed Management	Planning	Yes	Yes	Yes	Yes	Yes	No	Yes	No Data	
	Water Quality Monitoring	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Public Education	Yes		Yes	Yes		Yes	Yes	Yes	Yes
	Public Involvement	Yes		Yes	Yes	Yes	No	Yes	Yes	Yes
GIS	Physical Assets	Yes	Yes	Yes	Yes		Yes	Yes	Partial	Yes
	Natural Resources				No Data		No Data	Yes	Partial	Partial
GASB 34 Valuation		Yes		No	Yes		Yes	Ongoing	Partial	Yes





Community ID	Comment
<i>FFX</i>	
1	CIP includes road drainage, master planning, water quality, and dam safety projects.
2	Dam Safety activity only undertaken on water supply reservoir dams; roadway drainage managed with VDOT, but not required by state law.
3	
4	CIP is mostly flood control projects
5	
6	
7	
8	CIP includes work on routine maintenance and remedial maintenance projects.





Table 5: Program Elements in Stormwater Budget

Program Area		Community ID									
		FFX CO	1	2	3	4	5	6	7	8	
Customer Service			Yes					Yes	Yes		Yes
Stormwater Management	Plan Review	Yes		Yes							
	Facilities Inspection	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes
Erosion & Sediment Control		Yes		Yes			Yes	Yes	Yes	Yes	Yes
Floodplain Management		Yes					Yes	Yes	Yes	Yes	Yes
Dam Safety		Yes	Yes								
Roadway Drainage			Yes		Yes			Yes		Yes	Yes
Inspection Services	Construction	Yes		Yes	Yes			Yes	Yes	Yes	
	Maintenance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Regulatory	Yes	Yes	Yes			Yes	Yes		Yes	
Capital Improvement Program	Management	Yes	Yes	Yes			Yes	Yes		Yes	Yes
	Design	Yes	Yes	Yes			Yes	Yes		Yes	Yes
	Construction Oversight			Yes				Yes		Yes	Yes
Environmental Mandates	NPDES Phase 1	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
	NPDES Phase 2										
	TMDL	Yes							Yes	Yes	Yes
Watershed Management	Planning	Yes	Yes	Yes	Yes	Yes			Yes		
	Water Quality Monitoring	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes
	Public Education	Yes		Yes				Yes	Yes	Yes	Yes
	Public Involvement	Yes			Yes	Yes			Yes	Yes	Yes
GIS	Physical Assets	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes
	Natural Resources								Yes		
GASB 34 Valuation		Yes						Yes		Yes	Yes





Table 6: Stormwater Expenses

Community ID	Stormwater ³Budget	Customer Metrics		Per Capita \$	\$ / mi²	\$ / Mile of Stormwater System
		Population	Area (mi²)			
FFX	\$ 11,752,000	997,600	378	\$ 11.78	\$31,089.95	
1	\$ 17,465,800	435,000	312	\$ 40.15	\$55,980.13	
2	\$ 3,941,000	284,000	440	\$ 13.88	\$8,956.82	
3	\$ 3,276,150	826,000	483	\$ 3.97 ⁴	\$6,782.92 ³	\$4550
4	\$ 26,254,600	782,815	469	\$ 33.54	\$55,979.96	
5	\$ 10,700,000	455,100	281	\$ 23.51	\$38,078.29	\$4638
6	\$ 8,600,000	231,300	304	\$ 37.18	\$28,289.47	
7	\$ 35,000,000	700,000	447	\$ 50.00	\$78,299.78	
8	\$ 14,000,000	545,000	497	\$ 25.69	\$28,169.01	\$3431

³ Budget numbers are based fiscal year 2004 spending projections.

⁴ Budget and costs shown for #3 are for maintenance activities and watershed planning only and are not included in calculations on average per capita costs used in report.





Table 7: Stormwater Funding Used

Funding Mechanism	Community ID								
	FFX	1	2	3	4	5	6	7	8
General Funds	✓		✓		✓	✓	✓		✓
Water / Sewer Enterprise Fund						✓			
Stormwater User Fee	⊕	✓		✓		⊕	⊕	✓	
Stormwater Tax					✓				
Pro Rata Share	✓		✓		✓				
Permit Fees			✓		✓			✓	✓
Review Fees			✓		✓			✓	✓
Other		✓	✓		✓	✓		✓	✓
Grants	✓				✓	✓		✓	
✓: Active Funding Mechanism ⊕: Under consideration									
Community ID	Comments								
FFX									
1	26% of funding from VDOT road maintenance								
2	Two drainage districts utilize pro-rata funding, including Upper Swift Creek. Pro-rata fee is set at \$5010 per impervious acre.								
3	Water Quality Fee only funds the County stormwater maintenance program.								
4	Dedicated stormwater tax generates \$22.5 million of \$26.2 million budget for stormwater management								
5									
6									
7	Stormwater utility generates roughly \$26 million of the jurisdictions' \$35 million annually.								
8									





APPENDIX II

EXISTING STORMWATER PROGRAM COSTS

Introduction

The following cost information was developed in consultation with Fairfax staff and is meant as a snapshot of stormwater spending in FY' 04. These are not budget numbers but are an estimation of spending by function to demonstrate how stormwater costs are distributed across the agency.

FAIRFAX COUNTY, VIRGINIA FY 2004 STORMWATER PROGRAM COST ALLOCATION												
Program Element			Maint & SW Mngt (MSMD)		SW Planning (SWPD)		Public Works (DPWES)		Miscellaneous (MISC)		Combined	
			Costs	FTE	Costs	FTE	Costs	FTE	Costs	FTE	Costs	FTE
Administration & Management												
<i>Labor Costs</i>												
General Administration	---	----	\$ 169,024	4.0	\$ 22,962	0.6	\$ -		\$ -			
Purchasing			\$ -		\$ -		\$ -		\$ -			
HR Functions			\$ -		\$ -		\$ -		\$ -			
General Program Planning & Development			\$ 84,512	2.0	\$ 19,134	0.5	\$ -		\$ -			
Budget and Cost Controls			\$ -		\$ 19,134	0.5	\$ -		\$ -			
Contract Management			\$ 84,512	2.0	\$ 53,575	1.4	\$ -		\$ -			
Legal Services			\$ -		\$ -		\$ -		\$ -			
Facilities Management			\$ -		\$ -		\$ -		\$ -			
Other Support Services			\$ 42,256	1.0	\$ -		\$ -		\$ -			
			\$ -		\$ -		\$ -		\$ -			
<i>Benefits (percent of labor cost)</i>	24%		\$ 92,832		\$ 28,024		\$ -		\$ -			
<i>Subtotal</i>			\$ 473,136	9.0	\$ 142,829	3.0					\$ 615,965	12.00
Contractual Services												
<i>Operating Expenses</i>			\$ 301,875		\$ 20,245							
<i>Capital Outlay</i>			\$ 74,175		\$ 60,000							
<i>Combined Cost Center Total</i>			\$ 849,186		\$ 223,074						\$ 1,072,260	
Special Programs												
Public Education/Outreach	---	----			\$ 11,480	0.3						
GIS, Mapping and Database Management			\$ 105,640	2.5	\$ 19,134	0.5						
Inter-Agency Cooperative Activities					\$ 7,654	0.2						
					\$ -							
<i>Benefits (percent of labor cost)</i>	24%		\$ 25,787		\$ 9,341		\$ -		\$ -			
<i>Subtotal</i>			\$ 131,427	2.5	\$ 47,609	1.0	\$ -		\$ -		\$ 179,036	3.50
Contractual Services												
<i>Supplies</i>	---	----										
<i>Capital Outlay</i>	---	----										
<i>Combined Cost Center Total</i>			\$ 131,427		\$ 47,609		\$ -		\$ -		\$ 179,036	
Billing and Finance												
Billing Operations	---	----										
Financial Management			\$ 105,640	2.5								
Capital Outlay												
<i>Benefits (percent of labor cost)</i>	24%		\$ 25,787									
<i>Subtotal</i>			\$ 131,427	2.5	\$ -		\$ -		\$ -		\$ 131,427	2.50
Supplies												
<i>Capital Outlay</i>	---	----										
<i>Combined Cost Center Total</i>			\$ 131,427		\$ -		\$ -		\$ -		\$ 131,427	

(continued on next page)





FAIRFAX COUNTY, VIRGINIA FY 2004 STORMWATER PROGRAM COST ALLOCATION											
Program Element	Maint & SW Mngt (MSMD)		SW Planning (SWPD)		Public Works (DPWES)		Miscellaneous (MISC)		Combined		
	Costs	FTE	Costs	FTE	Costs	FTE	Costs	FTE	Costs	FTE	
Watershed Management - Planning											
Master Planning	---	----	\$ 114,803	3.0							
BMP Development			\$ 7,654	0.2							
MS4 Monitoring			\$ 19,134	0.5							
Comprehensive Monitoring Program			\$ 172,205	4.5							
Stream Protection and Restoration			\$ 38,268	1.0							
BMP Programs and Activities			\$ 19,134	0.5							
Used Oil & Toxic Materials			\$ -								
Spill Response and Clean Up			\$ -								
Program for Public Education & Reporting			\$ 7,654	0.2							
Illicit or Cross Connections			\$ 7,654	0.2							
Illegal Dumping			\$ 7,654	0.2							
Multi-objective Planning Support			\$ 7,654	0.2							
Zoning Support			\$ 19,134	0.5							
Landfills and Other Waste Facilities											
Benefits (percent of labor costs)	24%		\$ 102,753								
Subtotal			\$ 523,701	11.0	\$ -		\$ -		\$ 523,701	11.00	
Contractual Services	---	----	\$ 50,000								
Supplies											
Capital Outlay	---	----	\$ 1,591,035								
Combined Cost Center Total			\$ 2,164,736	11.0	\$ -		\$ -		\$ 2,164,736		
Engineering Design											
Design Criteria, Standards and Guidance	---	----	\$ 38,268	1.0							
BMP Analysis & Design			\$ 191,339	5.0							
Design, Field and Operations Engineering			\$ 76,535	2.0							
Hazard Mitigation			\$ 19,134	0.5							
Dam Safety Program			\$ 38,268	1.0	\$ 46,872	0.80					
Retrofitting Program			\$ 38,268	1.0							
Flood Insurance Program			\$ 38,268	1.0							
Community Rating System			\$ 19,134	0.5							
Benefits (percent of labor costs)	24%		\$ 112,094		\$ 11,441		\$ -				
Subtotal			\$ 571,308	12.0	\$ 58,313	0.80	\$ -		\$ 629,622	12.80	
Contractual Services	---	----									
Supplies	---	----									
Capital Outlay	---	----	\$ 712,346								
Combined Cost Center Total			\$ 1,283,654		\$ 58,313		\$ -		\$ 1,341,968		
Operations and Maintenance											
General Maintenance Management			\$ 253,000	6.0							
SW Management Facilities Maintenance			\$ 520,348	12.3							
Conveyance System Maintenance			\$ 1,090,205	25.8							
General Remedial Maintenance											
Emergency Response Maintenance			\$ 173,250	4.1	\$ 5,954		\$ 888	0.03			
Infrastructure Management											
GASB 34			\$ 21,128	0.5							
Field Data Collection (inventory)											
Public Drainage System Inspection/Regulation			\$ 169,024	4.0							
Private Facilities Inspection/Regulation			\$ 105,640	2.5							
Public Assistance/Complaint Response			\$ 84,512	2.0							
Benefits (percent of labor costs)	24%		\$ 580,106		\$ 1,429		\$ 213		\$ -		
Subtotal			\$ 2,997,213	57.2	\$ 7,383		\$ 1,101	0.03	\$ -		
Contract Services	---	----	\$ 175,000								
Operating Expenses	---	----	\$ 573,125								
Capital Outlay	---	----	\$ 60,843								
Capital - Equipment			\$ 210,000								
Combined Cost Center Total			\$ 3,955,338		\$ 68,226		\$ 1,101		\$ -		
Plan Review & Erosion Control											
General Code Development & Review	---	----					\$ 420,000	6.0			
Stormwater System Inspections - new dev.							\$ 350,000	5.0			
Regulatory Enforcement											
General Permit Administration							\$ 70,000	1.0			
Erosion & Sediment Control Program							\$ -				
Benefits (percent of labor costs)	24%						\$ 205,044				
Subtotal							\$ 1,045,044	12.0	\$ 1,045,044	12.00	
Supplies	---	----									
Capital Outlay	---	----									
Combined Cost Center Total			\$ -		\$ -		\$ 1,045,044		\$ 1,045,044		
Construction Services											
Major Capital Improvements	---	----			\$ 119,763	2.0					
Minor Capital Improvements					\$ 54,771	1.0					
Land, Easements, and R-Q-W Acquisition					\$ 67,543	1.1					
Benefits (percent of labor costs)	24%				\$ -		\$ 59,091		\$ -		
Subtotal					\$ -		\$ 301,168	4.1	\$ -		
Contractual Services	---	----									
Supplies	---	----									
Capital Outlay	---	----	\$ 75,689		\$ 1,416,105						
Combined Cost Center Total			\$ 75,689		\$ 1,416,105		\$ 301,168		\$ -		
Department Total			\$ 5,143,066	71.2	\$ 5,203,404	27.0	\$ 360,583	4.93	\$ 1,045,044	12.0	
Combined County Total									\$ 11,752,097	115.13	

Note: 1.) Calculation of benefits based on actual audited rate of 24.41%
 2.) Plan Review and Erosion Control expenses under Miscellaneous include 100% of costs. It is recognized that 80% of these costs are currently covered by fees.



APPENDIX III

POTENTIAL BILLING OPTIONS

A. INTRODUCTION

In order to assess the best method to allocate the costs for a stormwater program to potential payers within a user-fee system, a number of issues must be evaluated in detail. The task of creating a stormwater fee and distributing that fee to all customers in the service area is a two-part effort. First, an account database must be created that contains all potential customers and their associated calculated fees. Secondly, the fees must be billed to the customers through a new or existing billing system formatted specifically for the stormwater fee. This report will focus on both the creation of the account database and the billing mechanism used to implement the fee.

1. CREATING THE INITIAL MASTER ACCOUNT FILE (MAF)

a. ESSENTIAL DATA ELEMENTS

At a minimum, the initial MAF is a database of customer accounts containing associated stormwater fees for each account. Generally, stormwater user fees are parcel-based calculations involving the amount of impervious area (IA) on the parcel, or a combination of IA and another quantifiable measure, such as gross area (GA) of the parcel. The IA of the parcel is often made up of existing data layers maintained by the City or County and often augmented by the use of current aerial imagery.

Because of the parcel-based nature of the fee, additional information describing parcels must also be obtained. The Tax Assessor database is often used to identify property land use, owner name, and tax-exempt status. These property characteristics help steer how various stormwater fees are calculated and potentially how the fees are actually billed. In some instances, a land records database or other property-related database may be more appropriate than the assessor information.

There are four basic data elements: 1) parcels, 2) impervious features, 3) aerial imagery, and 4) the tax assessor database, that comprise the fundamental pieces needed to construct an account file. Other data may be used to augment the calculation of bills or differentiation of property types, but these four elements typically provide the basis for the stormwater MAF.

I. PARCEL DATA LAYER

The parcel data layer represents the foundation for billing stormwater fees in a typical methodology designed to estimate the amount of impervious surface per individual parcel. The spatial integrity and horizontal accuracy of the parcel layer is essential to the accuracy of the calculated fee. Only that area within the boundaries of a parcel will be considered for IA calculations. Parcel boundaries that actually encroach upon adjacent properties create slivers of area that are potential areas of billing dispute.



However, stormwater fees are not based on measurements of impervious surface accurate to the square foot.

Fairfax County GIS maintains a parcel data layer containing over 342,000 parcels, including parcels for the cities of Clifton, Herndon, and Vienna. The County does not maintain parcels for the cities of Alexandria, Fairfax, and Falls Church. The GIS group processes about 4,200 parcel updates per year. Most parcel updates are processed and completed in the parcel data layer within two weeks of official recording with the Register of Deeds.

In Fairfax County, the Parcel Identification Number (PIN) associated with each parcel is a character field based on map, quad, and lot number. This is a unique identifier for parcels and is generally a 13-character item such as:

0022_01_0003A

Duplicate testing of the PIN field revealed no duplicates in the entire group of 342,462 parcels.

Common areas associated with condos and other attached properties contain a partial PIN. Partial PINs contain a map, quad, and subdivision number such as:

0481__07__B1

The map and quad numbers correlate to the map and quad numbers of the lots within the subdivision or common area.

Overall, the parcel data layer is aggressively maintained and would serve as an adequate basis for billing for stormwater in the County.

II. PLANIMETRIC DATA LAYERS ASSOCIATED WITH IMPERVIOUS FEATURES

Fairfax County acquired aerial imagery and planimetric data in 1997. Planimetric layers contributing to a potential impervious layer include both major and minor transportation layers and the building layer. These layers contain impervious features such as building footprints, roads, commercial driveways, and parking lots. The layers do not contain other impervious features such as large sidewalks, patios, hardened plaza areas between buildings, athletic courts, or other miscellaneous impervious features. Of course, there was no intention on the part of the County to acquire a complete impervious data layer for stormwater purposes back in 1997.

Although a great deal of impervious data exists in the existing geographic information captured in 1997, two challenges exist concerning using this data as the starting point for a comprehensive impervious layer. First, the data was captured in 1997 and has been updated (building footprints) somewhat by the GIS group for new development. However, because of the size and scope of the development in Fairfax County, many of



the changes occurring in the County over the last seven years have not been captured. Secondly, those “missing” impervious features mentioned in the previous paragraph represent a substantial amount of impervious surface (potential revenue) for many parcels. For example, the government center parcel contains over 45,000 sq. ft. of IA in sidewalks alone. Given a theoretical ERU of 2,500 sq. ft., the sidewalks represent 18 billing units. This “missing” data could potentially represent hundreds of dollars in lost annual stormwater revenue, depending on the rate.

Measurement of impervious surface and the horizontal accuracy of parcel boundaries need to be reliable, but not exact, as the size of the base billing unit will compensate for the inherent inaccuracy issues of parcels and impervious data. Impervious surface data is usually captured manually using photo-interpretation techniques. Parcel data is often “off” horizontally by 3’ – 10’ when merged with ortho-rectified aerial imagery. So, a property line that is “off” by 8’ and is 100’ in length might attribute 800’ of IA to the wrong parcel. Utilizing a billing unit will often compensate for these and others inaccuracy errors inherent in GIS data layers. In some areas, parcel boundaries in Fairfax County are “off” the horizontal position of the ortho-rectified imagery by 8’ to 10’. This horizontal accuracy level is at the upper end of the tolerable limit for use in generating a fee but should not affect a significant number of the fees calculated.

In order to understand the magnitude of incomplete impervious surface data, several examples are included:



Approximately 19,500 sq. ft. of IA not in current planimetric data



Approximately 35,000 sq. ft. of IA not in current planimetric data



Approximately 131,000 sq. ft. of IA not in current planimetric data

III. AERIAL IMAGERY

Initial aerial imagery acquired by the County in 1997 has been updated on an annual basis for ¼ of the County area over each of the past several years. This revolving update program is still in place, so that imagery for any portion of the County is never more than three years old. These imagery sets are flown at a scale of 1:1200 and contain a pixel resolution of 0.5'.

In addition, the County has access to Virginia Geographic Information Network (VGIN) imagery captured during 2002 at a scale of 1:1,200 and a pixel resolution of 1.0'. A small portion of this imagery near Mason's Neck was captured at a scale of 1:2,400 and a pixel resolution of 2.0'. Although the VGIN imagery represents a contiguous set of imagery captured on the same date, this data will soon not be as current as imagery being acquired through the revolving program.

IV. DEPARTMENT OF TAX ADMINISTRATION

The assessor database has been reviewed and determined to be an acceptable means for classifying properties for stormwater billing purposes. Fields relating to zone class and building use have been identified as the keys in property classification. Information relating to vacant properties is also available, as this is crucial to identifying residential subdivision properties that have not yet been developed.

B. RATE METHODOLOGY ISSUES

Because the impervious data needed to generate stormwater fees is incomplete, a number of issues begin to surface when determining an appropriate rate methodology for a potential stormwater utility. Since the impervious data available does not include all impervious surfaces and since Fairfax County is a large, diverse and highly-developed county, other options will be considered.

The discussion of data needs to support the Master Account File is correlated to the Rate Structure Discussion Paper. Rate modifiers involve consideration of the ability to support the cost allocation to a single rate payer through the data available. It is critical that a rational relationship be supported by the data sets chosen for this analysis. Single family residential properties are one key rate base and modifiers in rate policy can be established to address this significant portion of the account file. As presented in the Rate Structure paper, two primary approaches to single family residential properties are being considered. One is to "flat rate" all properties creating an Equivalent Residential Unit (ERU) as the basis for analysis of all parcels. The other approach is to set a base billing unit, perhaps 2000 square feet of imperviousness, called an Equivalent Rate Unit, where each single family residential parcel is evaluated for the number of billing units found on the parcel, often with a cap on the number of billing units for this category of properties based on policy considerations identified during the analysis.

Data Analysis Using an Equivalent Residential Unit: The ERU is the amount of impervious area on an average or typical single-family residential (SFR) parcel. The ERU is usually based on a sample of various SFR properties, resulting in a median value of IA for the sample, which then becomes the ERU for the utility service area. The ERU can be a combination of IA and GA where the IA is often a percentage of the GA



based on a sample of SFR properties. In both cases, the ERU is based on a median value of impervious area for either a sample of SFR properties or the total population of SFR properties. When non single-family residential (NSFR) properties are billed, the total amount of IA per parcel is divided by the ERU, resulting in a number of billing units that are multiplied by the rate to obtain a monthly fee. So, if an NSFR property contains 20,000 sq. ft. of IA and the ERU is 2,500 sq. ft., the property is billed for 8 ERUs (or billing units) per month.

1. SFR PROPERTIES

Since significant gaps are present in the impervious data for the County, the first issue that should be addressed is that of using a flat rate or base billing rate for SFR properties. A flat rate is the concept of charging each SFR property with a single, flat billing unit as discussed above. In the flat rate scheme, SFR properties are not reviewed individually and do not require impervious data to support the calculation of a fee. When using a base billing unit in terms of imperviousness, SFR properties are “tiered” by assigning each parcel a number of billing units (or tiers, such as one billing unit equals “tier one”).

If tiers are to be implemented, then data must be available to fit all SFR properties into their appropriate tier. In the absence of impervious data, there is usually no accurate method for directly assigning individual properties to tiers. However, there are less conservative methods involving sampling and interpolation that may allow SFR properties to be assigned. For example, AMEC has used fields in the assessor database to mimic impervious features on the ground. This is not as precise and could result in too large a variance to actual field measurements. This option was evaluated for another client and we discovered:

- For 50% of the sampled parcels, the tax-derived impervious values differed from the GIS-derived values by 50%.
- For only 13% of the sampled parcels, the tax-derived impervious values were within $\pm 10\%$ of the GIS-derived values.

Options for data to support single family residential account analysis:

1. Since driveways and other features (patios, large utility buildings, tennis courts, etc.) are the missing elements for impervious data on the SFR property side, an option exists for sampling driveways and other features and assigning an average driveway and “other feature” IA to the total IA for each SFR property. Using this impervious estimate option, the house footprint becomes the only variable in the total IA per parcel. The driveway and “other features” impervious components are constant values or percentages for all SFR properties. It should be noted that studies by AMEC have shown that driveways alone represent 30% to 40% of the total impervious area on an SFR property. This option could potentially oversimplify the impervious area for SFR properties, but could be accomplished without developing a complete impervious coverage and can be substantiated as a reasonable and rational method for cost allocation.

2. To fill the gaps in the impervious coverage and to most accurately place SFR properties in tiers in Fairfax County, the county could develop a current, complete, and



comprehensive impervious data layer for all SFR properties. Though this is a costly option, it will provide the most reliable and defensible data.

3. A flat rate for all single family residential properties could be created through analysis of a sample of properties.

2. NSFR PROPERTIES

The issues for NSFR property fees are similar to those for SFR properties, but not identical. Because of the diversity of IA within NSFR properties (multi-residential, commercial, industrial, institutional, etc.), there is an even greater need for a current, complete, and comprehensive impervious data set.

The first option to consider would be to acquire an updated impervious data layer for NSFR properties only. A complete impervious data layer for NSFR billing would represent the most conservative method. This would also require the implementation of a methodology to capture new imperviousness created the day after the flight is flown for new photography if that is done OR a methodology must be put in place to capture new imperviousness built since the most recent capture of digital images.

The second option, with somewhat more risk, would be to obtain impervious data for adequate samples of different land use types. The median impervious percentage for each land use would then be applied to the GA of each parcel to estimate IA per NSFR parcel. This option is often less reliable because many property land use types vary greatly within a single land use in terms of percentage of impervious surface. For example, consider the following two NSFR properties classified with a land use of "Commercial and Office". Both properties are similar in GA, however, the first property contains about 40% of impervious surface while the second example clearly demonstrates a more urban example of the same land use with greater than 95% impervious surface area.





“Commercial and Office” land use – approximately 40% impervious surface



“Commercial and Office” land use – greater than 95% impervious surface

The examples above demonstrate common challenges in finding adequate indicators (such as land use) for consolidating properties based on impervious development.

C. RATE STRATEGIES

Based upon a preliminary review of existing data, the options presented below represent rate alternatives available based on the practical application of the data available to support the cost allocation. Issues and key factors for each option is described under the option. The following assumptions have been made in describing the rate options:

- Land use data found in the County assessor database is reasonably accurate for general land use classifications.
- Land use categories in the County assessor database can be aggregated into approximately 8 to 10 major categories if NSFR sampling is used.
- Vacant SFR lots can be easily identified in the assessor database.
- No field(s) exists in the County's assessor database that can be used to mimic a complete representation (buildings, driveways, parking lots, patios, plazas, and other hardened surfaces) of IA on a parcel.
- AMEC estimates that of the 342,000 parcels maintained by the County GIS group, there are 280,000 parcels associated with unincorporated Fairfax County.
- AMEC estimates that 15% (42,000) of the parcels in unincorporated Fairfax County are NSFR properties.
- The County GIS group has updated building footprint data for new development and re-development.

1. SFR OPTIONS

A1) Flat Rate – requires very limited impervious data development

- Process - approximately 1,000 SFR properties would be sampled to determine the ERU for the stormwater utility. All SFR properties would be billed 1 ERU.

A2) Partial Estimate / Tiers – impervious data development needed for approximately 1,000 SFR properties to obtain driveway and “other feature” average values

- Process – the average values for driveway and other features would be added to building footprint surface area to obtain a total IA per SFR property.
- Using average values for driveways and other impervious features introduces significant generalization to the impervious estimate but can be supported as a rational approach to the allocation of cost.
- Building footprint areas would have to be updated and entered into County GIS (see assumption above).
- The ERU would be based on the median value of IA for all SFR properties.
- SFR properties would be placed in tiers based on distribution of the IA for the total population of SFR properties.

A3) Tiers with a cap on billing units– requires complete impervious data for all SFR properties



- The billing unit would be based either on the measured median value of IA for all residential properties or on a fixed value (e.g., 1000 square feet of imperviousness).
- It would require new imagery be captured to produce complete and current data to eliminate inefficient effort to “backfill” missing impervious data for approx. 238,000 SFR parcels across quarter sections of the County where aerial imagery was captured during different years (current revolving imagery update).
- New imagery could not be captured until late 2005 and complete impervious data and imagery probably would not be available until 3rd quarter of 2006.

2. NSFR OPTIONS

B1) Combination of GA and Estimate of IA – requires sampling of approx. 4,200 properties within different land use categories

- IA would be estimated by multiplying average impervious percentage of land use by (GA) of each NSFR property.
- Significant variation will exist within land use categories impacting impervious percentage.
- The impervious data development for the approx. 4,200 properties would have to consider date of aerial imagery (current revolving imagery update) in guaranteeing that current impervious development is captured.

B2) Existing Imagery / Complete IA – requires current, complete, and comprehensive IA data for all NSFR properties

- The impervious area data development for the approx. 42,000 properties would have to consider date of aerial imagery (current revolving imagery update) in guaranteeing that current impervious development is captured.

B3) New Imagery / Complete IA – requires new imagery to produce current, complete, and comprehensive IA data for all NSFR properties

- New imagery would allow for a more efficient process to develop complete IA data set
- New imagery could not be captured until late 2005 and resulting imagery and IA data not available until fall or winter of 2006

3. RATE STRATEGY TIME AND COSTS

The following are broad estimates of the time and costs for the development of IA and the ERU only. These estimates do not include other Data Track tasks commonly associated with stormwater utility development. Options listed as A1 through A3 represent SFR labor and cost estimates while options B1 through B3 represent NSFR labor and cost estimates. An option for both SFR and NSFR development must be chosen. (Note that the expense costs for A3 are those costs associated with another vendor developing complete IA data for all properties from new imagery. The imagery costs (\$50,000) are not included in A3 but listed in B3 because this option would automatically result in B3 being chosen also.)



Resources - Option	Labor (hrs)	Expense Cost
A1 - Flat Rate SFR	100	\$0.00
A2 - Partial Estimate / Tiers	120	\$0.00
A3 - Tiers / Complete IA / New Imagery	80	\$1,400,000.00
B1 - GA and Estimate of IA	645	\$0.00
B2 - Existing Imagery / Complete IA	5370	\$0.00
B3 - New Imagery / Complete IA	4320	\$50,000.00

Time Requirements - Option	IA Development Complete
A1 - Flat Rate SFR	3 weeks after start
A2 - Partial Estimate / Tiers	3 weeks after start
A3 - Tiers / Complete IA / New Imagery	3rd quarter of 2006
B1 - GA and Estimate of IA	12 weeks after start
B2 - Existing Imagery / Complete IA	10 months after start
B3 - New Imagery / Complete IA	3rd quarter of 2006

C. BILLING OPTIONS

There are essentially three options for billing stormwater fees: billing through a local water or wastewater utility or authority, billing through the real estate tax bill, or billing through a separate 3rd party billing system. This section will discuss details about the utility authority, a third party billing process and tax bill options specific to the situation in Fairfax County. Each option has advantages and disadvantages:

1. FAIRFAX COUNTY WATER AUTHORITY (FCWA)

Using the FCWA billing system has several advantages; the use of the FCWA billing system supports the concept of a utility service for the stormwater fee; the FCWA bills quarterly which would provide a steady revenue flow for a stormwater utility; and using the established FCWA billing system could allow regular opportunities to provide stormwater information to the public.

Challenges:

The use of FCWA represents a significant challenge in merging parcel-based accounts with meter-based accounts. The labor potentially needed to successfully merge the two billing systems should not be underestimated. The fundamental issue of linking the two systems will most likely require using physical addresses as the link between both the FCWA and the parcel-based stormwater fees. Much more will be known about the details of this process when the County GIS group completes the Master Address



Repository, a standardized address system that will associate physical addresses with both parcels and point locations within parcels. This addressing system should greatly benefit a linking with the FCWA billing system. Current plans forecast a completion of the addressing system by December, 2004. At this time, there are too many unknowns to estimate the amount of effort needed to merge a stormwater master account file with the FCWA billing database, but it is expected to be significant.

Another challenge using the FCWA as a billing mechanism is the issue of service area. The FCWA currently maintains about 235,000 accounts within Fairfax County. AMEC is estimating that there are approximately 280,000 parcels in unincorporated Fairfax County that will be within the stormwater service area. The difference between these two numbers might represent undeveloped properties and properties that are developed but do not receive water or sewer (parking lots). At this time, AMEC cannot estimate the number of properties that will be assessed stormwater fees that are not part of the FCWA billing system.

Finally, the FCWA board is currently hesitant to add an additional fee to customer bills. The Board has strived to keep residential bills under \$100 per quarter, and many residential customers are close to this threshold now.

2. SEPARATE "STORMWATER ONLY" BILLING SYSTEM

Establishment of a separate billing system for stormwater only, or that may include solid waste fees or other County fees as well, is a viable but more costly system. The advantages include total control over the design of a database and delivery system, along with a customer service system, that supports the administrative accounting and management processes for the County. Its biggest disadvantage is the cost of initial setup. This cost can be built into the rate model to recover the implementation resources utilized by the County to establish the initial billing system. It provides the greatest flexibility in communication with the public and meeting unique conditions for each account, such as management of a credit program and other adjustments that may be needed on any account. This process can provide a more consistent cash flow based on the frequency of the billing cycle. More frequent billing cycles will potentially increase the administrative cost of operation.

The County can outsource the billing system and customer service program, using a 3rd party billing agent or by utilization of the billing agent handling the real estate property tax.

3. DEPARTMENT OF TAX ADMINISTRATION (DTA)

From a technical integration of the data for the Master Account File, the DTA real estate bill represents the least challenging option for billing stormwater fees through an existing system. Parcel-based fees can be translated to this bill much easier than using a meter-based account system. Similar efforts for other Counties have generally involved 4 to 6 weeks of effort. In Fairfax County, the tax bill is billed twice per year which is more beneficial for stormwater revenue flow than a typical once-per-year tax cycle. The DTA tax billing system is currently being upgraded, and the new system will allow for billing of flat fees.





It is estimated that there are approximately 5,500 (< 2% of the total parcels in the County) tax-exempt properties in the County. Many of these parcels currently receive solid waste fees through the DTA billing system, with perhaps as few as 200 parcels that would require the establishment of a stormwater only bill.

The only parcels that would be problematic for billing from the DTA system would be the properties assessed by the State Corporation Commission; however, there are less than 200 of these parcels currently in the system.

The current real estate tax bill contains a line-item fee for solid waste. Sources within DTA/RED say that additional line item fees would probably require a re-design of the bill format.

BILLING OPTION SUMMARY

Fairfax County Water Authority or Wastewater Bill

Pros:	Cons:
Supports the concept of a “utility” service for a stormwater fee.	Difficult to merge property-based MAF with meter-based billing system.
Provides consistent cash flow.	Properties that don’t have water/sewer service (i.e. parking lots) will need to be added to system.
Billing and accounting system in place that would require minimal adjustment to add additional fee.	Unoccupied properties require billing of stormwater fee though other fees may be suspended.
Can be used as a methodology for direct communication to the public.	Properties with multiple meters may require splitting stormwater fee.
Address standardization in progress will help with merging files.	Consensus needed at executive level to allow use of the Authority billing system.

Fairfax County Real Estate Bill

Pros:	Cons:
Stormwater fee is property-based making link between MAF and tax database relatively easy.	Requires high level of customer support and education to support tax office.
Bill is delivered to property owner, regardless of land use or occupancy.	Revenue is received twice a year, requiring cash flow planning.
Master account file updated annually.	May require redesign of bill format.
Billing and accounting system in place.	



Separate Billing System

Pros:	Cons:
Supports the concept of a “utility” service for a fee.	Expense of creating a new billing and accounting system (staff, hardware, software, office space, etc.)
Cash flow can be continuous throughout the year – very flexible.	Collection of delinquent accounts may be more challenging.
Can be used as a means of direct communication to the public.	Must set up new fiscal controls for receipt of payments.

POTENTIAL BILLING OPTIONS

AMEC recommends that the DTA real estate tax billing process be used to facilitate the billing of stormwater fees. This could include the creation of a separate bill for stormwater fees, managed by the DTA or the direct billing of the fees on the real estate tax bill itself. This recommendation is based on a number of factors including:

1. The FCWA board does not wish to add further fees to their bills as this might result in most quarterly residential bills to exceed the \$100 threshold that the board is trying to maintain.
2. The FCWA service area as well as the waste water service area does not cover the entire service area for stormwater management.
3. Some of the service area for stormwater management provided by the County receives water services from another jurisdiction, requiring the creation of a separate billing process to address these accounts as well as those identified under Item 2 today.
4. Until the Master Address Repository is complete, the potential success of linking stormwater accounts to FCWA accounts is unknown. Even if the new addressing system is successful, a great deal of effort will still be needed to allocate fees to parcels with multiple FCWA service locations or aggregate fees for service locations covering multiple parcels.
5. The DTA real estate tax bill provides the best coverage for billing parcels within a potential Fairfax County stormwater utility.
6. A separate third party billing system is more costly to establish and administer.



APPENDIX IV

COMMUNICATIONS PLAN STRATEGIES

A. PHASE 1 - COMMUNITY OUTREACH FOR PROGRAM DEVELOPMENT

Phase 1 of the communications strategy begins after the Board of Supervisors is briefed on the Study and authorizes the County staff to continue with program development, clarification of the levels of service and finalization of the funding options recommendation. This Phase continues through the early spring, when staff will bring to the Board the final program implementation recommendations. This portion of the Plan is designed to raise awareness in the public of challenges in Fairfax County for pollution control, regulatory compliance and program development. It is also focused on refinement of the level of service requirements to build the stormwater program to meet community expectations.

The “public” of interest in the earliest phase of the communications program includes the potential significant ratepayers, apartment/condominium owners, commercial/office property owners, developers and non-profits (i.e. those most notably affected by the new policies). In Fairfax County, it may also be useful to host a meeting with environmental advocates, concerned watershed groups, and other potential supporters of effective stormwater management. The press is a focus of attention during this period.

The goal of the message during this phase of the communications program is to educate and build support, as well as to attempt to bring opposing stakeholder groups to at least a position of neutrality toward the enhanced stormwater program. Therefore the message highlights the current problems experienced by Fairfax County residents; it notes that all properties generate runoff; it stresses the benefits of the planned stormwater program; it introduces the concept of a fairer and more stable way to pay for the program, and it gives basic information on the process that is used to determine rates and credits. Attention should also be given to educating County employees on the overall stormwater initiatives and funding strategies of the organization to meet the County’s needs in stormwater.

This plan is divided into specific initial steps that must be undertaken as early as possible and then other ongoing activities that should be consistently used throughout the Buildup Phase.

1. INITIAL COMMUNICATIONS STEPS

There are several important pieces of work that form the foundation for future communications that will be initiated simultaneously at the beginning of the implementation phase:

- Production of initial written materials for use with various audiences;
- Initial briefings of key stakeholders
- Creation of a Stormwater Advisory Committee

The product of these initiatives provides both the initial specific test messages and the vehicles from which to test them. An explanation of each of these activities follows:





- Initial Briefing of Key Audiences

During July, the County leadership, key County Board members, staff members, and the Environmental Committee should be targeted for presentations either oral or written about the program and the recommendations from the initial Study. These presentations or reports (depending on the audience) answer key questions and solicit support for the proposed changes in service and related activities. In all cases, this should be the first of several times throughout the development of an enhanced stormwater program and funding strategy that these key groups receive information regarding the proposed plan.

It is critical to involve the Board of Supervisors in a special meeting early in the process to provide information to and receive guidance from them regarding the stormwater program needs and challenges along with the kinds of funding mechanisms available, why and how they are used, and how stormwater management programs are being funded in other areas.

In addition, briefings for County leadership, impacted staff and other key stakeholders should occur prior to the briefing of the Board. These steps will ensure that all elements necessary to engage in a public discussion have been considered and addressed.

- Appointment of Citizen Advisory Committee for Stormwater

The Citizen Advisory Committee is an invaluable asset that will help the County get to the thoughts and feelings of the public regarding the program, the need for change, and funding options. It gives relevance to recommendations made by the staff (and eventually the Board of Supervisors) regarding funding strategies, levels of service and extent of service, and provides the opportunity to test reactions to rates and methods of billing.

This Committee is given a clearly defined advisory role. Upon completion of the initial work of the Committee, the Board will determine if they want this committee or another committee to continue to meet, to hear and to discuss issues regarding other elements of the stormwater program.

Role and Structure of the Committee	
Role of Committee	It is the mission of the Committee to review, through a structure process, policy and program structure for stormwater, with a final summary report prepared and presented to the Board of Supervisors. This is an “advisory” role and the Committee will not be responsible for making decisions that are the responsibility of the Board or staff.
Meeting Schedule	The first meeting of the Committee will be held on or about October 1, 2004 . The Committee will meet at least monthly and perhaps every three weeks when working on critical issues or program elements. It is the goal to have the Committee complete their work by February 2005.
Membership	The Board of Supervisors will appoint the Committee and it should be composed of 15 to 20 members . The following make-up of the Committee is recommended (suggested representatives are identified): <ul style="list-style-type: none"> • Representatives of public facilities (school system, parks system) • Representatives of non-profit organizations • Representatives of business and industry (Chamber of Commerce, Realtors) • Representatives of environmental organizations/community (MWSP, EQAC) • Representatives of the builders/developers (NVBIA) • Representatives of homeowners associations/neighborhoods • Representatives of retail/merchants • Representatives of large potential rate payers.



GENERAL BACKGROUND ON ADVISORY COMMITTEES:

The first decision in establishing the committee is how the committee members would be appointed. Direct appointment by elected officials and direct appointment by staff have been successful methods for committee formation. The choice of political appointment or staff appointment is usually based on what has been the practice of the community in the past. The Board of Supervisors usually appoints Fairfax County's committees, so it is likely that the County would choose to have the Board appoint the Stormwater Advisory Committee.

It is worth noting that in cases where staff appoints an advisory committee, communities realize the potential for more flexibility. With this approach, the group would be managed by and would report to the County Executive or his designated representative rather than the elected body. Staff-appointed committees may offer less of a perception of "political" involvement and often present a clearer understanding of the "advisory" role anticipated. In addition, it usually requires less time to set up a committee appointed by staff.

The next decision in creating a Committee is "who" should serve. One approach is to identify organizational representation for the committee (i.e., home builders, environmental groups, community groups, educational groups, chamber of commerce, etc.) and allow the organizations chosen to participate to appoint their own member or members. This approach keeps staff from having to identify specific individuals to represent the interests of any one organization. A sample list of the kinds of groups that might be of interest is shown in Attachment #1.

Fairfax County's Stormwater Management Team has developed a list of major stakeholder groups, including many of the types of organizations and associations and government agencies represented by this generic list, and that should be a starting point to consider some nominees for this committee. As a beginning list, Committee members might be composed of a combination of the following: Board of Supervisors representatives, Apartment/Condominium interests, Northern Virginia Building Industry Association, Chamber of Commerce, Fairfax County Environmental Quality Advisory Council, League of Women Voters, and others from the list of interest to Fairfax County. It is also possible to invite Technical Staff Members to join the group, including the Northern Virginia Soil and Water Conservation District, Northern Virginia Regional Commission, and Fairfax County Water Authority.

It is critically important that a staff member be identified as the coordinator for Advisory Committee meetings and for communication with members. Having one person responsible ensures that the participants know who and how to contact staff for assistance.

Every meeting will be open to the public and meeting minutes will be developed. Materials prepared for discussion along with summaries of the position taken by the Committee will be available at each meeting, as appropriate. Their meeting notices and meeting minutes should be posted on the County's website to generate additional public and media interest in the comprehensive stormwater management program. Information and handouts addressing the items to be discussed should be presented to the stakeholders and made available to the media. The press might interview individual stakeholders. Special efforts to prepare members of the group for this possibility help keep the message consistent.

Upon adoption of an enhanced program of services, as some of the most knowledgeable citizens on the issue of stormwater, some or all of the members of the Citizens Advisory





Committee should be enlisted to help in the effort to explain the role of the program and funding strategy and to help communicate to the citizens the challenges of the County in addressing level of service issues as well as the rationale for the stormwater user-fee approach.

2. ON-GOING PHASE 1 ACTIVITIES:

The Phase continues through April 2005. Activities are focused on audiences that need to know more in-depth information about the program. . The audiences are mainly internal and “partner” groups including the Citizen Advisory Committee.

Communication tools are added during this phase continues to expand the details and depth of the materials that are produced, to devise new ways in which to highlight stormwater management issues, such as with the press, and to produce materials (presentations, reports, FAQ) useful to demonstrate the current status of the stormwater management program.

a. AUDIENCE

Board of Supervisors - Status reports (Not-In-Package [NIP] Items) regarding progress may be given to the Supervisors as milestones are reached. In addition, depending on the Board's preference, minutes of the Citizen Advisory Committee may be passed to the Supervisors for their information. At a minimum, these kinds of reports should be sent to the Supervisors at least quarterly throughout the process. A Report to the Board about progress should be made in late February 2005 or early March 2005.

Upon completion of the Advisory Committee's work, the Board may wish to discuss more informally some of the Committee's proposals at the Board Committee level and in a formal Board meeting when final recommendations come forward. Video of these special meetings dealing with the issue can be useful in carrying the discussion to other organizations and can be broadcast so that the County's residents can get a better idea of the process behind the program.

Some Board members may conduct special “town meetings” in their districts to discuss important issues that have worked effectively in other communities. Each Board member could have a meeting like this for their district. These can also be videotaped for use on the County's cable channel.

When discussions turn to funding, the County could hold a public meeting to discuss the finer points of user fees, enterprise funds, and so on. This activity could be incorporated into a Board meeting or special meeting. Explaining what funding methods were evaluated and how they function in support of local programs helps to clear up any questions about the dedication of the funding source. It also provides an opportunity for the Supervisors to assure their citizens that they are strongly aware of the issues and questions regarding the importance of stormwater management.

Throughout the process, the County should also attempt to keep a representative from each of the Supervisors' staffs informed, perhaps the staff person dealing with Environmental Issues or other related matters.





Internal Staff – Many staff members will be continuously engaged in the development of the program through review of committee materials, updated FAQs, development of organizational processes regarding customer service, inspections or other related activities. In addition, a monthly one-page summary of activities/status report should be sent to the County Executive and key staff to keep everyone informed of the status.

General Public - To address the future needs of stormwater communications, it is important to determine what the County residents currently know about stormwater and stormwater management programs. In-depth interviews will be conducted to get qualitative analysis of the current communications methods and effectiveness. In addition, up to 40 additional internal stakeholders and/or partner organizations will be given an email survey and asked to return it to an independent party for a quantitative analysis of the program's strengths, effectiveness, and needs. At the same time, results of reports, citizens committees, and past stakeholder and public involvement activities (i.e., 2002 the Chesapeake Bay Program survey) will be reviewed to help determine the current levels of public awareness of stormwater management and to identify issues of concern among the general public and the various stakeholder groups that properly could be addressed through public involvement. It may be possible in the early stages of the program planning to find an event (fair, festival, etc.) where a large number of citizens would gather and, with the help of a well-crafted short survey, gather responses from at least 100 or so attendees.

b. COMMUNICATION TOOLS

Internet Microsite- Perhaps the most useful and cost effective medium for conveying information about the Stormwater Program and funding strategy in Fairfax County during the Buildup phase is the County's website, (<http://www.fairfaxcounty.gov/>). It is recommended that relevant information about stormwater and the County's funding strategy be gathered into a "microsite" within the current County domain so that citizens could access all stormwater related material from a single stormwater homepage (e.g. <http://www.fairfaxcounty.gov/stormwater/>).

This site could contain a base of information to which all other forms of public notice about stormwater could refer. There are several pieces of information that could be placed on the microsite at this time and any number of items on the current County website that could be moved and categorized in a microsite: This is also one of the first and most obvious candidates for more visibility for the County's stormwater "identity" (see below).

- An FAQ about stormwater and why it is important to care about managing it.
- The County's VPDES Phase I application and comprehensive Stormwater Management Program along with the Annual Report.
- FAQ regarding the Stormwater Management Program
- Information on Watershed studies
- Updates on regulatory issues and initiatives to address them in Fairfax

The Stormwater Microsite should include an emailing address to a County employee contact that could respond to citizen's questions. These questions could also be added over time to the FAQ. Links to the nine individual County Board Members and Chairman's Office websites, to watershed groups, and to other environmental sites that may be of interest to the viewer can also be provided. As additional information becomes available, it is easily added to the site so that the Stormwater Microsite would always be the most accessible and up-to-date source of information on Stormwater in Fairfax.



The cost of operating the Stormwater Microsite would be negligible in terms of hardware and software, since the County already has a high quality website in use. The development and maintenance effort would entail several weeks of programming time for creation of the site plus one day per month for updates and modifications.

Identity Development - This involves the actions necessary to differentiate the stormwater service from other services provided by the County. Building one look for all the stormwater materials establishes quicker recognition for citizens who require assistance or information.. The actions taken in this regard will vary depending on County preference for differentiation. It may eventually involve letterhead, vehicle decals, uniforms, department status, etc. A decision on any symbols used to represent the Stormwater Program should be made early so that there is time to establish the identity in public awareness. The cost of this process largely overlaps with exiting costs for letterhead, vehicle painting, etc. Some design costs might be incurred initially if a professional graphic artist is required.

Continuing Materials Update – As milestones are reached, new information is gathered or significant decisions are made, the FAQs and other written and website materials continuously are updated appropriately. In addition, the County can develop fact sheets regarding program status that can be placed in public places and on the website, keeping citizens informed both prior to and following special meetings of the Board to give briefs on items of interest.

Public Information Officers Within the County, Cities, and Towns within Fairfax County Limits – Arrange to make a presentation to PIOs during their regular meeting, to start building a relationship with them regarding this program, and to ask for their assistance in rolling the program out around the County. Ensuring that they have effective information on the work underway in Fairfax will help reduce any misunderstanding of the role the County is undertaking regarding these services. If other jurisdictions desire to participate in a more regional effort, this is one information conduit that will support that effectively.

News Articles - Some news organizations allow, and even appreciate, the County providing materials about the program. These should be interesting stories about challenges in addressing flooded areas, the need for a new funding method, etc. The news media should be notified of important meetings (including the Citizen Advisory Committee meetings) and be granted interviews when requested. At least one press kit should be developed once the major policy decisions have been completed that give the press details of the planned implementation, along with fact sheets about the program.

Testimonials – Testimonials (e.g. help to a local homeowner) work well in conjunction with presentations and within news articles. They are most effective when the audience can identify with the speaker in some way. A good testimonial involves someone who is perceived to be honest and appropriately emotional, who is articulate when giving the story clearly and cogently, and who can demonstrate the value of the program in fixing their particular flooding problem.

County Festivals Street Fairs, Other Civil Events - Since the County already participates in local festivals and other civic events, fairs like *Celebrate Fairfax* and *Fall For Fairfax*, it would be easy to develop a table-top presentation or other materials to depict ways in which the public can participate in complying with clean water guidelines. The Stormwater Planning Division already has a display that may work for this purpose.





Speakers Bureau – It would be helpful if Fairfax County develops a proactive speakers' bureau of stormwater professionals (senior staff members) who will go into the community and discuss stormwater issues, needs, and potentially how a rate was developed with the general public. Speakers should be trained to present stormwater information and to address questions from the audience. Where it's possible, they could be paired with a member of the Citizen Advisory Committee. All presenters should be trained and have one or two "canned" presentations that can be used with public groups.

There are many stakeholder groups who can be influential in the positive reception of an expanded stormwater program and funding strategy such as a utility if they are informed and understand the need, the way in which the user-fee is calculated, and the fee structure. It is especially useful to find a number of planned meetings in which the stormwater management story can be told; in this way, it reaches people at the places they would normally be attending and gives the stormwater management speakers a built-in audience. In these meetings it is important to demonstrate recognition of opinion leaders' positions and influence, to listen to their concerns, if possible solicit their support, and to respond quickly to questions that cannot be answered on the spot but require follow up. It is important to target presentation to include representatives of the major ratepayers, churches, public sector, and press.

The cost associated with news articles, testimonials, and individual meetings could be substantial in terms of staff time, but this effort would be dispersed over a number of employees or other contracted staff.

B. PHASE 2 – PROGRAM ADOPTION AND YEAR ONE IMPLEMENTATION

On the current schedule, Phase 2 begins in April through FY 2006. This Phase is dedicated to making the audiences aware that a change in stormwater services and funding will be coming and developing an understanding of how services will evolve over time, with more consistent and stable funding for the stormwater management program. If the Board of Supervisors adopts a new funding approach, implementing a stormwater utility, the "public" of interest during this Phase is all ratepayers, including residents, property owners, and business owners. The goal is to educate them about service changes and the new fees they are going to pay. The message must be communicated effectively, often one-on-one, and consistently. There must be a phone line for the public staffed by people that are knowledgeable and who can answer basic questions. There also must be technical personnel who can handle referred questions about the stormwater financial credits, fee management policies, rate structure, fee calculations and the bill amount. Most importantly, it is important to demonstrate that the enhanced stormwater program is active and effective.

COMMUNICATIONS ACTIVITIES AND MATERIALS:

Because the County is physically large and requires specific communications tools to address the centers where people gather, so the Communications Plan also addresses how and where face-to-face communications and general communications should take place.



Informational Brochure(s) - These brochures are designed to give a simple explanation of the program, why it is necessary, and what better stormwater management will accomplish. It should be developed to answer the most common questions asked by a large number of people yet kept non-technical. There may be several brochures that target different information (general information, answer questions on billing, how to get a complaint addressed, maintenance policies and responsibilities, etc.)

In addition, a list of planned capital improvements along with a projected schedule for construction has proven to be very successful. Such a brochure would also be helpful for Fairfax given the focus of the program on the construction of numerous smaller capital and remedial maintenance projects. It should also link the Watershed Planning initiatives to the Capital Improvement Program, with targeted materials for each geographic area, if possible.

This brochure(s) should be matched with a planned and prepared set of previously contracted capital improvements, which could be ready to break ground the day the first bills go out. These projects should be managed so that the media's coverage of the program is about progress in fixing long-standing problems and not about a new fee or charge.

Brochures and fact sheets may also be scheduled for production through the County's VPDES Phase I Program. Linking messages of water quality protection with an enhanced service capability is important. Coordination of these messages should be taken care of by communication staff in the Stormwater Planning Division.

Video-enabled Slide Presentation – A video presentation based on slides with a recorded script is an effective tool to explain the role of a Utility in funding Stormwater improvements and the impact of the Utility on ratepayers. This is useful as an adjunct to meetings with stakeholders and the press as well as County employees. With the County's already appreciable ability to produce videos, these same presentations could be video-based entirely. There is considerable footage available to provide background materials for the presentation.

Bill Stuffer- Regular bill mailings represent an economical vehicle for information dissemination. If a bill stuffer is to be used, the first one communicates the overall change in stormwater management, what programs are being initiated, and the priority of the effort. It explains that a bill will be sent in the future to pay for the program, and provides a point of contact for additional information. The second bill stuffer's purpose is to explain the residential rate structure, calling attention to specific planned projects and announcing that the next cycle's bill will include the stormwater management user fee. This technique has to be carefully coordinated with the designated stormwater-billing agent.

Customer Service - The mailing of a stormwater bill usually generates some inquiries and complaints. These communications will likely be fielded by several entities in the County, including Board of Supervisors' offices, County operational divisions, the County Office of Public Affairs, and the County billing entity (tax office, FCWA, other). Having a well-conceived and responsive customer service capability, which rapidly and effectively responds to these calls, is perhaps one of the best public relations options available. There will be a number of complaints that can be handled relatively easily by a trained customer service representative (even a temporary position for the first few months of billing). However, the County personnel should be available to handle more complex calls or particular important callers.



C. PHASE 3 – ON-GOING COMMUNICATIONS PROGRAM

The second and all subsequent years of the expanded, enhanced stormwater program requires continued communication with various stakeholders as well as the general public. An update on the progress made should be provided during each budget cycle for the Board of Supervisors as well as the general public. There should be consistent information on policies, a customer service attitude to the responses, and satisfying answers to most questions. The County staff should specifically focus communication on success of the enhanced investment in stormwater, using performance measures and project summaries to ensure continued support for the expanded activities. It will take many years to build a comprehensive program that can be absorbed into routine operations. The County leadership as well as the general public will need consistent, responsive information to sustain the program development.

During this period, the messages concern improvements in infrastructure, flooding, and water quality achieved as a result of the Stormwater Management Program. The focus is on giving those efforts maximum exposure. Progress on activities addressing the Chesapeake Bay and other key programs should be part of the on-going communications efforts. Measuring change is important so that the public understands the commitment undertaken by the County in improving overall quality of life in Fairfax.

COMMUNICATIONS ACTIVITIES AND MATERIALS FOR THIS PHASE:

School Programs- A long-term program for educating elementary school children about Stormwater would be a cost-effective way to build permanent community support for efforts to improve water quality. It might also be possible to incorporate some elements of water quality from this into the current “Investigation in Environmental Science” curriculum that is being used for the VPDES Phase I activities (and as part of the State’s Standards of Learning). This already reaches 12,000 7th graders in the Fairfax county Public School System. It might also be part of the current 9th grade Ecology curriculum that is reaching another 10,000 students. These programs are highly effective at changing the next generation’s habits and also at reaching the families of the students. The costs will not be excessive but will require the cooperation of the Science Coordinator at each elementary school in the County. Such a program is currently being done through the County’s VPDES Phase I program but could be used for both purposes. It may also be possible for the County to provide some credits to the school system for continuing its educational efforts regarding clean water.

Television and Radio Public Service Announcements – Once the stormwater funding would be in place, adding television and radio public service announcements to the mix could be quite effective. This is perhaps the best venue to provide information to citizens about particular ways they can help in water quality efforts. Some of Fairfax County’s priorities for education about oil and gasoline, fertilizers, etc. would lend themselves very well to these kinds of announcements.

County Service – Many communities now buy water-saving and conservation “tools” in bulk and provide them at low cost to citizens. For example, it would be possible to purchase a number of rain barrels and provide them on a first-come-first served basis to citizens. Some communities provide toilet and tap conservation tools through libraries and other local means on a large-scale basis to citizens.





In-house communication- The County could use training programs for employees and use internal newsletters to target messages about Stormwater. At least one such training session and/or employee newsletter should occur prior to sending the first bill.



Attachment #1 - Stakeholder Checklist

Organization or Interest	Recommendation
Chamber of Commerce	
Merchants Association	
Major Industry	
Public Schools	
Schools of High Education	
Engineering Department	
Biology/Geology Department	
Environmental Programs	
Community Groups	
Garden Council Environmental Program	
Beautification Organization	
Parks and Recreation Supporters	
Churches	
Civic Groups	
4-H Leadership	
Service Clubs	
Neighborhood Associations	
Homeowners Associations	
Real Estate Organizations	
Apartment Management Association	
Realtors Association	
Development Community	
Home Builders Association	
Developers Association	
General Contractors	
Governments	
County	
Adjacent Communities	
State Agencies	
Federal Agencies	
Professional Associations	
Engineers Association	
Landscapers/Nursery Associations	
Environmental Groups	
Sierra Club	
Local Focus Clubs	
Agricultural Groups	

This list is generic in nature and should be used to identify key community interests that should be involved in the program development for stormwater.



APPENDIX V

EXISTING DOCUMENT SUMMARY

Over the course of the last 12 years, the Fairfax County Department of Public Works and Environmental Services has considered the financial, programmatic, and public education policy aspects of the development and implementation of a dedicated funding mechanism for the County's stormwater management program. This report provides a comprehensive review of applicable background documentation on the County's past stormwater funding studies and identifies gaps and hurdles to previous implementation efforts. The documents examined in this report include a series of stormwater utility feasibility studies conducted in-house by the Department of Public Works and Environmental Services in the early and mid-1990s, as well as several utility and comprehensive stormwater management program development studies completed with consultant assistance in the late 1990s and 2000. A list of the documents examined is included in the Appendix.

A. INITIAL STUDY, JULY 1992

In July 1992, Fairfax County's Department of Public Works and Environmental Services began to assess the need for a stable, defensible, equitable, and adequate funding source for the County's stormwater management program. The 1992 study noted the need to provide stable stormwater management program funding for a number of reasons that remain true today. Competing for funding for stormwater programming through the General Fund was difficult due to a recessed economic climate. The County was planning stormwater budget cuts for FY 1993. In addition, the Department report recognized the County's bonding limitations, both from a financial standpoint and from a citizen tolerance standpoint. Even with the County's recent implementation of its Pro Rata Share Program, which collects funding from developers for use in mitigating future drainage problems from new development, DPWES acknowledged a financial shortfall in programming capability.

The County also faced the need to implement state and federally mandated water quality regulations such as the National Pollutant Discharge Elimination System (NPDES) water quality regulations of the Clean Water Act and Virginia's Chesapeake Bay Preservation Act. The County recognized the need to continue to implement water quality best management practices (BMPs); to invest in infrastructure maintenance, repair, and replacement; and to address other capital improvement needs such as streambank stabilization and regional pond construction.

The County's 1992 study examined two different stormwater utility fee program alternatives. The first option was developed exclusively for stormwater management programming dealing with water quality concerns, a relatively new concept in stormwater management at the time in Fairfax County and in Virginia. This first utility fee option would fund the construction of regional detention ponds, streambank stabilization, and the maintenance of detention and other BMP facilities. The intent of the first option was to provide funding for water quality improvements needed to meet state and federal requirements while leaving more traditional stormwater management needs, such as



conveyance maintenance, to be funded via the General Fund, Pro Rata funding, and bonds.

Expenditure projections under this first utility fee scenario were developed for a 10-year planning window and included capital costs for construction of regional BMPs and streambank stabilization projects, maintenance of existing facilities, maintenance for those facilities projected to be constructed, and stream erosion mitigation projects for severely degraded streams. Projected revenues were determined using an Equivalent Residential Unit (ERU) rate methodology and an ERU calculation of 2,500 square feet of impervious cover for the average detached, single family home in Fairfax County. The Department estimated a flat rate of \$1.15 per ERU for 10 years on approximately 521,000 ERUs (which accounts for credits) would generate sufficient revenue, roughly \$72 million over 10 years, to fund the program elements described above.

The second examined option was designed to provide revenues for the planning, design, construction and maintenance of all public drainage needs, including stormwater quality, quantity, and conveyance facilities. In this second scenario, capital projects would be implemented in accordance with the following Board of Supervisors established policy for prioritizing drainage projects:

1. Achieve state and federally mandated stormwater programs
2. Alleviate structures from flooding
3. Alleviate severe bank and channel erosion
4. Alleviate minor bank and channel erosion
5. Alleviate yard flooding
6. Alleviate street flooding

The projected expenditures for the second alternative totaled roughly \$114 million over the 10 year planning window. The revenue estimate was constructed using the same formula as was used in the first scenario, though the number of ERUs changed without explanation. Using an ERU, of roughly 546,000, accounting for credits, the Department estimated that a rate of \$1.70 per ERU over 10 years would generate the necessary funding for this program.

The 1992 study recommended the inclusion of a credit program to provide a partial reduction in utility fees for property owners that maintain private stormwater management BMPs. Property owners would be required to apply for credit. In addition, the granting of a fee credit would be contingent upon the facility having been designed and constructed in accordance with criteria outlined in the County's Public Facilities Manual. Private maintenance agreements would also be required for receipt of a fee credit.

The 1992 study also covered the available billing options for the stormwater utility fee. Three alternatives were considered: adding the stormwater fee to the existing water/sewer bill; adding the stormwater fee to the property tax bill; and creation of a new, stormwater-only billing system. The study highlighted pros and cons of each alternative as follows.





<u>Mechanism</u>	<u>Pros</u>	<u>Cons</u>
<i>Add on to Utility Bill</i>	Helps establish the idea of SW as a “utility” function and fee, not a tax.	Confusion between sewer and stormwater control charges; Not all developed parcels are included in the County’s three separate billing systems; High potential administrative costs*.
<i>Add on to Tax Bill</i>	<ul style="list-style-type: none"> • Necessary data for determining SWU fees available for most parcels already contained in Real Estate Assessment database. • Better success rate for collection. 	Easier to perceive the new SWU fee as a tax.
<i>Stand-alone SW Bill</i>	More flexibility in establishment of SWU billing system	Expensive to create and maintain.

*Billing system at the time charged a flat fee of \$3.25 per bill to cover the administrative costs associated with adding additional collections.

The study recommended the use of the County property tax bill as it appeared to be the most expedient option to initiate and the least expensive to operate.

Finally, the 1992 study discussed the need for public information and participation in establishing a stormwater utility fee system. The study recognized the need for an equitable, defensible program, and highlights the need for a public information program to be developed prior to billing. Recommended strategies included the dissemination of written materials along with informational meetings for citizen groups, industry, and other interested organizations prior to the implementation of the stormwater utility.

ANALYSIS

The 1992 study covered each of the basic building blocks of stormwater utility development to some degree, discussing programming options, rate methodology, billing and collections, crediting, and public information dissemination. The study also highlighted the basic rationale for moving to utility funding for the County’s stormwater management program, the need for stable, adequate, equitable, and flexible funding. The 1992 study’s program definition and revenue and expenditure estimates used broad estimates of land cover based on land uses, rather than a more detailed methodology such as use of aerial photography or GIS-generated impervious cover, to estimate the total ERUs available for billing. There is also an inconsistency in the number of ERUs estimated depending on which of the study’s two alternatives are being examined that is not explained in the report. However, one of the most critical pieces to the utility development process that is missing from this report is the need to involve the public during the development of a stormwater utility fee system in Fairfax County, not just educate them at the end.



B. FOLLOW-UP STUDY, MARCH 1994

Following the initial study completed in 1992, the Fairfax County Department of Public Works and Environmental Services, at the direction of the Board of Supervisors, conducted a series of briefings for citizen groups, the business community, and other interested organizations to get reaction to the initial feasibility study work. While many viewed the stormwater utility concept favorably, County staff noted the differing comments received by many groups and the difficulty in revising the initial study to reach consensus on what should be funded through the stormwater utility and what programming should be included. In March 1994, Public Works staff revised the initial stormwater utility feasibility study to craft a single program proposal for consideration.

The 1994 report included a preliminary review of the County's needs and resources for stormwater controls, noting a projected \$300 million capital and maintenance need for water quality improvement facilities and major drainage improvement projects over the next 30 years. That need, coupled with meeting state and federal water quality mandates, was estimated to cost \$11.5 million per year over the 10 year planning period.

The 1994 report sets out a single utility funded program alternative, as opposed to the two alternatives proposed in 1992. In the 1994 revision, the utility would provide funding for planning, design, construction, and maintenance of the stormwater conveyance systems stormwater detention ponds, BMPs, streambank stabilization, and major drainage improvements needed to solve structural flooding of homes and businesses and severe streambank erosion problems. It would also fund the improvements needed to meet state and federally mandated water quality goals. It would not fund minor drainage needs (storm sewer conveyance systems and projects to eliminate yard flooding). The 1994 report also notes that future revenues from storm water bond referenda were expected to be reduced or eliminated upon utility fee implementation.

Expenditure categories included capital construction, maintenance and inspections, research and monitoring, and administration (including billing). The projected expenditures totaled approximately \$115 million over 10 years, including a \$640,000 development expense pay back. Capital projects would be completed using the same prioritization plan from the 1992 study:

1. Achieve state and federally mandated stormwater programs
2. Alleviate structures from flooding
3. Alleviate severe bank and channel erosion
4. Alleviate minor bank and channel erosion
5. Alleviate yard flooding
6. Alleviate street flooding

However, only projects in categories 1, 2, or 3 from the list above would be funded through the stormwater utility. Category 4, 5, and 6 projects would be funded through other means, including the General Fund.

The 1994 report provides a much more in-depth discussion of fee credits. While the County recognized that it would be prohibitively expensive to take over maintenance of all private stormwater management structures and BMPs, the County also recognized that those private structures do provide some level of stormwater impact mitigation





depending on design and use. The report recommends the use of utility fee credits to recognize those benefits.

Utilizing the same 2,500 square foot ERU assumption and using updated County statistics on land use, the 1994 report demonstrated a total of roughly 584,000 ERUs in the County. Adjusted for credits, the total number of ERUs for rate revenue analysis was calculated at approximately 536,000. Given that total and the expenditure expectations for the level of programming proposed, a rate of \$1.75 per ERU would generate \$118 million in the 10 year planning cycle.

The 1994 study offered almost identical analysis of billing and collection options as that offered in the 1992 report. The 1994 report reiterated the earlier recommendation to utilize the real estate tax bill as the initial billing mechanism, though the report did indicate a potential snag based on the fact that the current (at that time) property tax computer billing system was operating at total capacity and may not be able to accommodate the additional line item right away.

Finally, the 1994 report offered a two-year time frame for the development of the stormwater utility. In the first year, the Department of Public Works and Environmental Services proposed conducting a study to better determine the average impervious cover on a single family residential parcel through a representative sampling of properties. In addition, the Department would establish criteria for a fee credit program for those landowners who maintain their own stormwater control facilities and then present all findings to the Board of Supervisors. Upon approval from the Board, the Department would engage in the year two work plan. The second year work plan included determining parcel fee amounts with the assistance of a consultant, establishment of a billing system, preparation and execution of a public information program, and preparation and public hearings for the utility ordinance. Developmental costs for the second year were anticipated at \$640,000, which could be recovered once the utility billing began.

ANALYSIS

While the 1994 study continued to address the central tenets of stormwater utility fee system development – program, rate methodology and rate base, billing and collection, and public input and involvement – several assumptions and factors require further consideration. By developing a program vision that did not include utility funding for more routine, minor drainage issues, the County would have had to establish its public information campaign very early in the process to educate its citizenry on what utility funds were providing in the way of projects. Without funding smaller, more localized projects, the County may have risked a utility “identity” problem without significant public outreach investment.

Secondly, by making the statement that stormwater bonding may no longer be necessary, the County basically states a position of “pay-as-you-go” for all large capital expenditures. As such, major infrastructure construction or replacement would only be done after the utility had built enough of a cash reserve to pay for the project. Building that much cash reserve may have inhibited the utility’s ability to provide other services, which could lead to increased backlogs and public perception problems. The report does not contain significant analysis of major capital replacement needs, which can offer major financial challenges without a policy decision to utilize bonding as a potential funding alternative.



Finally, while the report emphasizes the need for public meetings and outreach, the public component of the utility development process is not clearly spelled out and leads the reader to believe that the public component comes once the utility has been established rather than as the policies are being established and evaluated.

C. 1997 CAMP, DRESSER & MCKEE DRAFT STORMWATER UTILITY USER FEE REPORT

Following the first two stormwater utility feasibility studies conducted in house by the Fairfax County Department of Public Works, the County retained Camp, Dresser & McKee (CDM) to further refine the initial work and develop a more detailed stormwater utility feasibility study.

Similar to the prior studies conducted by the Department of Public Works and Environmental Services, the CDM report acknowledges the County's need for a stable, adequate, equitable, and flexible funding source for its stormwater management program. The CDM analysis includes only the unincorporated portions of the County (thus excluding cities and towns) and notes that a stormwater utility can enhance the current stormwater physical features by producing adequate and dedicated revenue to cover the cost of operation, maintenance, *and replacement, if necessary*, of those features, while providing future revenue to construct other capital improvements as needed.

The CDM report's account of the County's current level of stormwater service is consistent with the prior studies, noting operation and maintenance of storm drainage systems, BMPs, flood control structures, inspection and monitoring, testing, planning, research, and public education.

The CDM analysis included preliminary stormwater control program expenditures for an eight-year planning window running from FY 2001 through FY 2008. CDM developed three different expenditure scenarios to reflect three different levels of service, including a minimum needs level (Scenario A), a mid-range needs level (Scenario B), and a level of service that addresses needs on an accelerated basis (Scenario C). The average annual stormwater utility revenues over the first eight years of the program were estimated at \$12.9 million for Scenario A, \$19.2 million for Scenario B, and \$24.3 million for Scenario C.

The CDM report also explored the development of the utility rate structure and policy in much greater depth than had been pursued previously. Rather than relying on a single base unit, the ERU, the CDM analysis introduced the Single Family Unit (SFU) concept to the analysis. The ERU was investigated, but dismissed as it is based on an average imperviousness from all residential categories. The CDM analysis demonstrated that the variability in the average imperviousness from all residential categories was considered too wide to use the ERU. The SFU was established based on a statistical analysis of a sample set of the single family detached residential categories throughout the County. The parcel analysis of the County Assessor's database identified a total of 312,159 individual parcels in Fairfax County. A percentage of each of the residential parcel categories shown below was sampled to establish the SFU. The average impervious area of the single family detached parcel was determined to be 3,398 square feet, which



was established as the SFU. This base unit was used to develop a series of residential categories as follows:

Residential Category	Average Ft ² Impervious	Total # of Parcels	Sample Size (# of Parcels)	% of Total Res. Parcels	SFU Value
Tier I SF detached	1,849	174,015*	300*	62*	0.54
Tier II SF detached	3,398				1.00
Tier III SF detached	5,626				1.66
Tier IV SF detached	10,982				3.20
Townhouse	1,968	67,964	200	26	0.58
Apartment	807	3,144	120	1	0.24
Condominiums	962	Not listed	120	13	0.28
Mobile Home	2,256	17	8	>1	0.66

* total parcel number, sample size, and percentage of residential parcel statistics apply to all single family detached residential parcels.

Developed residential parcels accounted for 91 percent of all parcels and 32 percent of the total impervious area. Non-residential parcels, including undeveloped lands, made up 9 percent of the parcels, but account for 68 percent of the total impervious area in the County. These statistics do not include paved roads. Like the prior analysis, non-residential parcel charges would be based on their total impervious area divided by the SFU value of 3,398 square feet.

Based on CDM's analysis, the total number of SFUs available for billing equals roughly 454,700. This SFU number excludes federal, state, and county government properties, which were assumed to have a full waiver of the utility fee. As for the preferred billing mechanism, CDM's report recommends adding the stormwater utility fee charge as a new line item on the Fairfax County Water Authority's utility bill. It should be noted that the real estate tax bill had been the recommended billing mechanism in the two previous studies.

Much like the two prior studies, the CDM analysis also develops alternatives for the implementation of a credit policy. Based on CDM's analysis of the credit eligible impervious areas, the credit policy will reduce the total number of SFUs available for billing by 12 percent, necessitating an increase of approximately 13 percent in the user fee to account for the difference.

Projected future program expenditures were used to develop the rate ranges needed to provide necessary revenue to meet each of the three different programming conditions noted above, as follows:

Programming Scenario	Annual Fee Range	Monthly SFU charge
A – minimum needs	\$25 to \$27	\$2.08 to \$2.25
B – mid-level needs	\$38 to \$40	\$3.16 to \$3.33
C – all needs	\$48 to \$51	\$4.00 to \$4.25

The CDM study concluded with an itinerary of next steps towards the development of the County's stormwater utility, including the development of the billing accounts, verification of impervious area, matching parcels to utility accounts, field verification of some accounts, credit adjustment policy development, integration of the billing system, and general coordination and administration.



ANALYSIS

The 1997 CDM Draft Report explores the development and implementation of a stormwater utility service charge in greater detail than any of the previous studies, particularly with regard to County parcel analysis, rate structure, and rate methodology. However, as in previous studies, the 1997 report does not make significant mention of the need to engage the public in the process at some level prior to development of the program.

The rate structure developed in the 1997 analysis offers a more equitable distribution of fees, based on sampled conditions from a variety of different residential parcels throughout the County, than did prior analysis. However, the multi-tiered, multi-categorical residential rate methodology is more complex than a single, flat residential rate structure. As such, clear and effective education of the public and the Board of Supervisors becomes that much more critical. In addition, this educational effort would have needed to take place prior to the implementation of the program, rather than after the program has already been put in place.

D. STORMWATER UTILITY ADVISORY GROUP (SUAG) REPORT, DECEMBER 1998

In response to direction given by the Fairfax County Board of Supervisors in August 1996, County staff, in conjunction with the County's consultant, Camp, Dresser & McKee (CDM) coordinated and seated a Stormwater Utility Advisory Group (SUAG). The SUAG was comprised of representatives from industry, business, environmental organizations, citizens, and other interested constituents to provide input and assist staff in developing criteria, methodology, and policies for the County's stormwater management program. The SUAG, which was expanded in 1998 to include civic organization representatives, met nine times from November 1996 through September 1998 and developed position papers on a number of key programmatic issues.

As in previous studies, this report notes the need to develop a dedicated and equitable funding source for the County's stormwater management program. The report references a \$300 million capital project backlog of stormwater management obligations as well as a very substantial accumulation of maintenance deficiencies and infrastructure retrofits as a result of continuous under funding for several years.

The SUAG developed a series of specific recommendations for the County's stormwater utility program. The SUAG recommended that a uniform service charge system be developed and applied to all areas of the County. The recommended fee structure was a tiered system that required larger single-family detached homes to pay a higher fee than the fee required of condominium and townhouse owners. Non-residential property would be charged according to the actual amount of impervious surface on the property. The rate structure discussed and recommended was the same rate structure developed by CDM for the previous study, with several minor adjustments as demonstrated below:



Residential Category	Range of Ft ² Impervious	Average Ft ² Impervious	Percentile	SFU Value
Single Family, Estate	>7,597	10,982	Upper 5 [%]	3.23
Single Family, Large	5,314 to 7,597	5,626	90 to 95 th	1.66
Single Family, Average	2,094 to 5,314	3,398	10 to 90 th	1.00
Single Family, Small	<2,094	1,849	Lower 10 [%]	0.54
Mobile Homes	N/A	2,256	N/A	0.66
Townhouses	N/A	1,968	N/A	0.58
Condominiums & Apartments	N/A	875	N/A	0.26*
Non-Residential	N/A	Actual	N/A	Actual

* SUAG recommended that condominiums @ 0.28 SFUs and apartments @ 0.24 SFUs be combined to 0.26 SFUs.

The recommended service charge brought forth by the SUAG was \$57 per year per average single family house, which equates to Scenario C as prepared in the prior CDM study. This rate was projected to generate approximately \$24.3 million per year to provide for project implementation, a proactive maintenance program, preparation of watershed facility plans, infrastructure replacement, and other needs to greatly reduce stormwater pollution and enhance the quality of life in Fairfax County.

Additional SUAG recommendations included the deletion of privately owned roads and travel ways from measurements of impervious area. The report explains that in the determination of a tiered residential fee structure based on the average imperviousness of a “single-family unit” (SFU), most jurisdictions measure all impervious surfaces on private property including the privately owned travel ways, which are frequently found on multi-family developments. However, the equivalent roadway imperviousness serving single-family units are in public rights-of-way, legally exempt from stormwater service charges, and therefore cannot be measured in the SFU fee rate determination process. The SUAG subsequently recommended that the County not measure impervious surfaces associated with private roads and travel ways on multi-family residential, townhouse and mobile home park properties for the purpose of determining the SFU fee rate. This specific issue also led the SUAG to recommend that changes to the Virginia stormwater utility enabling legislation be executed in order to address this inequity.

The SUAG recommended the adoption of a credit policy that recognizes the value of privately owned and maintained stormwater management infrastructure and BMPs. The SUAG’s recommendations are largely identical to those examined in the previous CDM study. However, the SUAG also recommended that private facility owners have the option of petitioning the County for public maintenance of those facilities provided certain criteria are met. The SUAG also echoed the 1997 CDM report recommendation that the County add the stormwater utility fee charge to the Fairfax County Water Authority’s utility bill as an additional line item.

Finally, the SUAG recommended that the County proceed with the second phase of utility implementation, which centered on the development of the determination of the impervious surface for each parcel in the County.

ANALYSIS

The development and use of a citizen/stakeholder advisory committee demonstrates the County’s recognition of the need to engage the constituents of the stormwater management program early in the utility development process. The selected committee





represented a broad cross-section of the County's constituents. During the course of this committee's work, several additions were made to provide civic association representation. The report notes that the SUAG's recommendations represented the overall "consensus" of the committee but that the Fairfax County Chamber of Commerce preliminarily opposed the stormwater service charge program adoption. The Chamber was still evaluating the merits of the program and the report noted that the Chamber would make its official position known to the Board of Supervisors before or at a public hearing for adoption of a stormwater service charge program ordinance.

While it can be difficult to facilitate true consensus on the details of a stormwater utility program, overall "informed consent" from those constituencies represented on the committee is an important factor in successfully presenting the program to the Board of Supervisors and to implementation of the program. By allowing one constituent to make its position known to the Board independent of the advisory committee, the County runs the risk of that constituent announcing an adverse position in a public forum. A more desirable result would be to have opposing positions presented as part of the SUAG report, so that the County decision makers have all information available simultaneously.

E. CONCEPTUAL PLAN FOR A COMPREHENSIVE STORMWATER MANAGEMENT PROGRAM, CAMP, DRESSER & MCKEE, MARCH 2000

Following the 1998 SUAG report, Fairfax County's consultant, CDM, completed an assessment designed to frame a "vision" for a Comprehensive Stormwater Management Program for Fairfax County, describing the County's stormwater management needs and a roadmap for how to meet those needs. The 2000 report noted several key factors in the current state of the County's stormwater management program, namely that the County's program is largely reactive, driven mostly by citizen complaints and state and federal mandate compliance. As County funding for stormwater management programming had remained flat or been cut over the last 10 years, maintenance and capital projects have been deferred. The 2000 report noted that deferral of maintenance and capital projects has the potential to require even more expensive remedies down the road. Approximately 400 of the 600 capital projects identified by the County had been on the unfunded capital backlog for over 20 years. CDM estimated that the total capital backlog was \$300 million.

The 2000 CDM report also recognized the need to establish a community education program to make the citizens of Fairfax County more aware of the connection between proactive stormwater management programming, including regular stormwater maintenance activities, and quality of life in the County. The report noted that a proactive maintenance program would increase the public visibility of the stormwater program and would increase the number of residents who directly benefit from maintenance activities.

The 2000 report laid out the framework for a County comprehensive stormwater management program, noting the County's current "top down" stormwater management approach, and recommended a bottom up approach comprised of six elements. The recommended program relies on what the report referred to as a proactive approach driven by a "Stewardship Vision." The recommended elements are listed below.



1. Stewardship Vision Drives Comprehensive Stormwater Program
↓
2. Master Planning (Capital Projects, Stream Protection, and Maintenance)
↓
3. Proactive Capital Projects Program (Watershed based)
↓
4. Proactive System Maintenance Program (including Proactive Infrastructure Replacement)
↓
5. Stream Restoration Program
↓
6. Monitoring Program

The stewardship vision centered on the County's need to develop a new public education initiative that provides an illustration of how a comprehensive stormwater management program can support the broader County environmental resource stewardship vision and improve quality of life. The master planning component included the development of watershed plans to project build out conditions in major watershed, implementation of a stream protection master plan that builds on the County's Stream Protection Strategy (SPS), and a maintenance program master plan, for both the near term and long term. Proactive capital projects should have resulted from the watershed improvements master plan and recommend a phased CIP approach for each watershed and a CIP ranking system. The County should have transitioned to the recommended maintenance program as soon as funding is available so as to have an immediate, visible impact. Another visible impact would have been the implementation of a stream restoration program for heavily impacted streams in urban areas. Finally, the County should include a monitoring program that allows for evaluation of progress.

The 2000 CDM report continued to discuss the County's need for dedicated funding of the program. Public education was highlighted as a key element, not only for the conceptual stormwater management program, but also for its benefits in developing and implementing a funding option. The report highlighted the benefits of what is now referred to as the stormwater environmental utility fee. The report's fiscal needs projection for the implementation of the conceptual program included several activities:

- Master plans/Stormwater Management studies
- Billing system/Administration
- Maintenance programming
- Capital projects
- Pro-rata Share Program

The report noted the need for \$25 to \$30 million dollars each year over a five year planning window to implement the recommended approach, with maintenance and capital project implementation accounting for the majority of expected expenditures. These figures include costs associated with development of the County stormwater environmental utility fee program. To generate the necessary revenue, the report noted a need for the monthly SFU fee to start at \$4.25 in FY 2002 and increase in steps to \$4.75 per SFU by FY 2006, based upon the future SFU projections contained in prior CDM reports. Of particular note, the 2000 CDM report recommended that the SUAG





suggestion regarding the exclusion of private travelways from the impervious calculations be changed to include these impervious areas.

ANALYSIS

The 2000 CDM report examines the County stormwater management programming needs in greater detail than its previous reports, concentrating the discussion more on implementation strategies and necessary studies than on funding. The report lays out a strategy that places necessary emphasis on the development of more visibility for the County stormwater management program and focuses attention on projects that can provide the visibility that the program has lacked over its history. The report notes the need for remedial maintenance, and acknowledges that regular maintenance must be performed in order to avoid larger maintenance expenses in the future. Master planning, as documented in this report, is an extremely powerful tool for use in the development of a more proactive stormwater program, and the report presents a viable strategy for the development of necessary master planning tools.

To implement the funding strategy, the report notes the need to finalize the SUAG report that was drafted in 1998. According to later documentation, the SUAG recommendations were presented to the Board of Supervisors for consideration in December 1998. Since then, the County has continued to change, develop, and redevelop. The consensus reached in the first SUAG process may be outdated and needs to be revisited in order to make its conclusions viable.

F. 2003 STORMWATER MANAGEMENT BUSINESS AREA ENVIRONMENTAL SCAN

In 2003, the Department of Public Works and Environmental Services, with assistance from AMEC Earth & Environmental, Inc. (AMEC), conducted an Environmental Scan of the stormwater business area (STW) to promote future-oriented thinking in both the management and staff and as background to their strategic planning effort. This report was intended to provide management and staff with a "snapshot" of external and internal trends so that the STW could proactively address critical issues. The organization's direct and indirect stakeholders, e.g. employees, stakeholders, political leaders, and other interested parties were surveyed to provide information regarding the internal environment.

This report divided the information about the external environment into a separate category from the internal business of running the stormwater program. The external environment considered the macro environment, including social, technological, economic, environmental and political facts and trends that affect the future of the stormwater program in Fairfax County. Some of the external factors investigated were the economic circumstances in the County, regulatory data, demographics, infrastructure data, environmental data, public perception and citizen expectations, and other unplanned external factors.

Internal environmental factors include the County's own goals for stormwater management, available implementation mechanisms, organizational structure, programming, revenue sources, resource allocation in terms of both funding and staff resources, public outreach, and the internal organizational climate.



Presented below are conclusions that were drawn from the Environmental Scan.

- 1) External demands will continue to drive the majority of initiatives in the STW. That is, agencies outside of the STW (Federal, State, and County) will largely drive internal programming. This does not diminish the importance of short- or long-range planning; however, it does mean that planning for discretionary programming must be more strongly focused.
- 2) Fairfax County's existing tax base is not likely to increase appreciably in the short term. It is unclear how a shift from new development to infill/redevelopment will ultimately affect the County's revenue generating capacity. Therefore competition with other County programs will remain high, unless new sources of funding are identified.
- 3) There will always be more work/programs than can be accomplished by the STW. Therefore, the STW will need to think strategically about which projects or programs it will undertake in order to maintain acceptable standards of quality.
- 4) The STW's human resources have become overstressed due to taking on additional regulatory and planning functions (TMDLs, Chesapeake Bay, Regional Ponds, etc.), as well as maintaining an increasing facilities inventory without a corresponding increase in staff. The STW needs to benchmark the optimal staff necessary to achieve STW goals and find ways to increase and decrease staffing without jeopardizing programming.
- 5) Inconsistent public outreach efforts have led to misinterpretation or a lack of understanding of the STW mission and successes. A consistent program highlighting achievements and progress will bring the public to a better understanding of the need for stormwater programs.
- 6) Despite recent organizational and leadership changes in the STW and DPWES, it will be a long-term endeavor to shed old perceptions about how business is done. As a result, there will be continued confusion as to the STW's direction and mission. A consistent internal communications process within the STW is key to gaining staff-level trust in the organization's leadership.
- 7) Momentum caused by high-profile STW-related regulatory mandates, recent reports by the STW demonstrating the impacts of growth on water and ecological resources, and a generally friendly political environment towards stormwater issues can be used by the STW to enhance existing programming.

The Environmental Scan set the premise for the development of the STW Strategic Plan, which is summarized in the next section.

ANALYSIS

The Environmental Scan highlighted many of the themes that have been established relating to the Fairfax County stormwater management program in prior reports. External factors were cited as driving a great deal of the County's stormwater management programming. It also noted that resources are scarce and the needs for stormwater service are continuing to increase. Program staff continue to take on new roles while staff size and resources remain relatively static. The Environmental Scan provided the County with an introspective look at County stormwater operations and offered analysis of their perceived internal and external strengths, weaknesses, opportunities, and threats and how these factors impact the program.

The Environmental Scan focused on funding to the extent that resource availability and allocation are keys to describing the business area environment. Funding discussions





centered largely on the conceptual funding sources for stormwater programming, including primary and secondary funding sources. Primary funding sources discussed included general fund appropriations, stormwater service fees, and general obligation and revenue bonds. Secondary funding sources included special assessments, pro-rata share programs, watershed improvement districts, federal and state grant funding, in-lieu-of-construction fees, and other service fees.

G. 2003 STORMWATER MANAGEMENT BUSINESS AREA STRATEGIC PLAN

As a follow up to the 2003 Environmental Scan, the Department of Public Works and Environmental Services Stormwater Management Business Area initiated a Strategic Plan. The purpose of the Strategic Plan was to focus future decision-making within the Stormwater Management Business Area and to provide a management tool from which to judge progress towards meeting the STW's Mission Statement and its major goals regarding resources, reputation, programs, and people.

Through the Strategic Plan, the STW identified four goals, 10 strategies, and 35 tactics to form the basis for focusing future efforts. One of the four goals, "To be an effective steward of the County's resources," touches directly on the issue of establishing sustainable resources, and included as a tactic "Develop and implement a funding feasibility study for alternative methods and funding sources." Four specific tactics, where close coordination will be critical to successful implementation, will be used as performance measures for the County's Performance Measurement Budget Plan in support of the County's Strategic Vision Elements. These include:

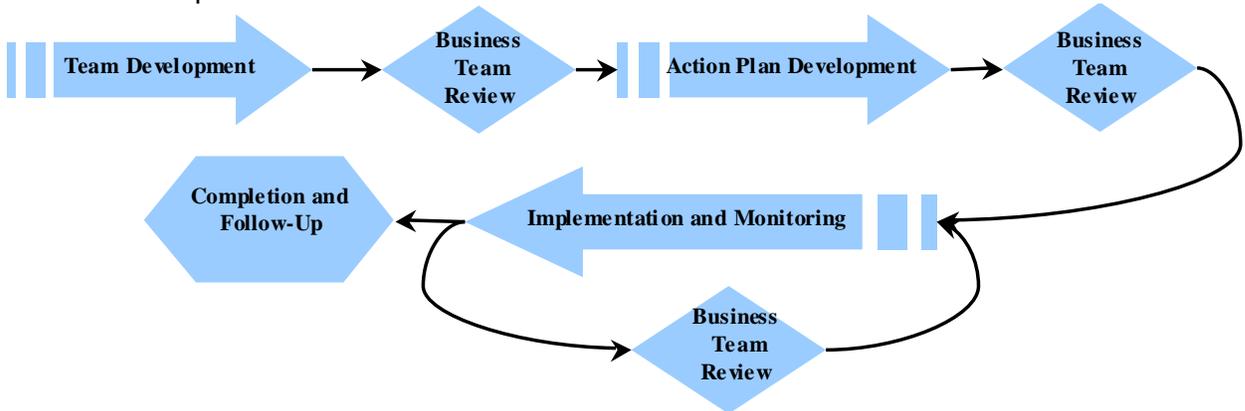
- Be a good steward in implementing the commitments of the Chesapeake Bay Agreement.
- Maintain a comprehensive watershed management program under the MS4 permit.
- Develop an integrated emergency response program.
- Support County air quality initiatives.

Each Tactic contained in the Strategic Plan will be achieved through the development of a detailed Action Plan. The directors of the Maintenance and Stormwater Management Division and the Stormwater Planning Division will be responsible for maintaining a master calendar to track Action Plan milestones.





Action Plan Implementation Process



ANALYSIS

As in the Environmental Scan, the Strategic Plan document was designed to focus on core values, mission, priorities, and action plan development for the STW. While neither document addressed program funding in detail, both establish the premise for moving forward with examining different funding options by recognizing that funding and resource availability are key elements to the County fulfilling the vision and mission established for the stormwater program.



REFERENCES

Stormwater Utility Proposal for Fairfax County, Feasibility Study, Fairfax County Department of Public Works, July 1992.

Stormwater Utility User Fee Program, Feasibility Study, Fairfax County Department of Public Works, March 1994.

Fairfax County, Virginia Stormwater Utility User Fee Program, Draft Report, Camp, Dresser & McKee, May 1997.

Implementation of a Stormwater Service Charge Program for Fairfax County, Draft report to the Board of Supervisors by the Stormwater Utility Advisory Group (SUAG), Camp, Dresser, & McKee, December 1998.

Conceptual Plan for a Comprehensive Stormwater Management Program, Final Report, Camp, Dresser, & McKee, March 2000.

Stormwater Management Business Area, Department of Public Works and Environmental Services, Environmental Scan, AMEC Earth & Environmental, Inc., April 8, 2003.

Stormwater Management Business Area, Department of Public Works and Environmental Services, Strategic Plan, AMEC Earth & Environmental, Inc., August 15, 2003.

