Town of Chapel Hill, North Carolina

Comprehensive Report

Implementation of a Utility-based Stormwater Management Program

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February 12, 2004

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Summary

In January 2003, the Town acquired the services of AMEC Earth and Environmental, Inc. to assist them in developing the program and funding scenarios that would allow implementation of a comprehensive stormwater management program in Chapel Hill. This report is a comprehensive summary of the progress made to date in developing a utility-based comprehensive program for the Town. This report recaps the key items that have been accomplished and those that will be accomplished based on near-term policy determinations to be made by the Town. It also points to the factors that would allow the Town of Chapel Hill to begin its utility implementation for the 2004-5 fiscal year and the timing and decisions necessary for that to happen.

History

The Town of Chapel Hill has long recognized that it requires a more coordinated approach to its stormwater management to meet regulatory and community expectations. The Town continues to grow and additional resources have not been available to handle the increased workload related to stormwater. Over the past several years, Federal, state, regional and local government regulations continue to tighten and to create more mandatory stormwater management programs. The Town has studied these issues since 1992 with three separate stormwater advisory committees providing input. Each of the three committees recommended that the Town develop a stormwater management program funded through a utility.

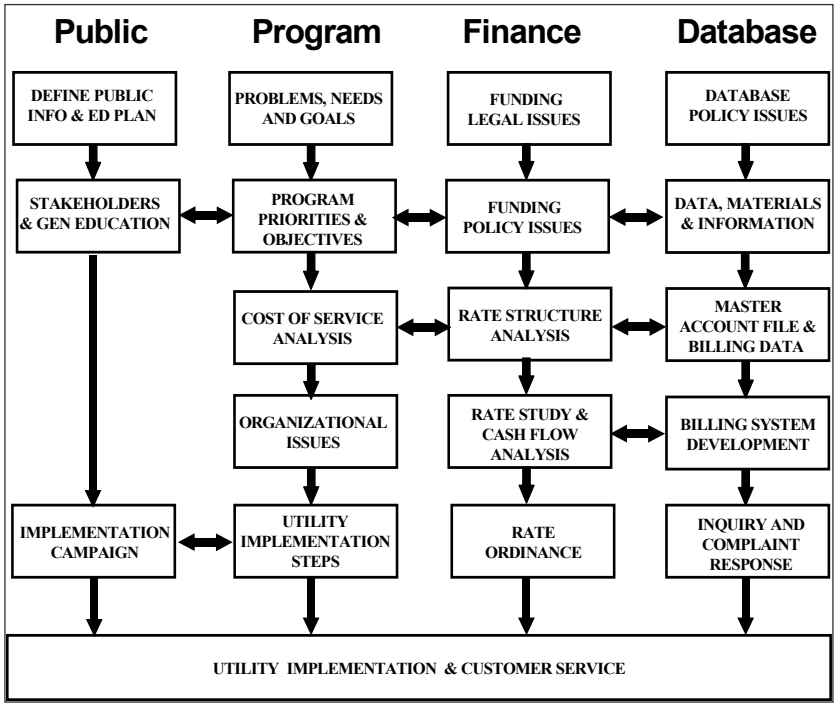
After years of study it was clear that inadequate funding has been a major impediment to attaining solutions for the Town's drainage problems for many years and has been documented through analysis by three previous initiatives during the 1990s. The Town has not had a cohesive, coordinated program or a single organizational entity or budgetary account for stormwater management. Operations and budgets have historically been dispersed among several departments. Infrastructure improvement needs have been identified, but have largely gone unmet for lack of consistent funding. Federal water quality mandates now require that the Town also focus resources on stormwater quality. There is a compelling need to provide better stormwater management services Town wide. To do so the Town must increase revenues from current sources, adopt other sources to supplement or supplant them, or do both.

In 2002, the Town Council, in recognition of the growing concern for providing appropriate services to citizens, and with the information gathered through staff and these committees, authorized the development of a Utility-Based Stormwater Management Program Business Plan that outlined the process to be undertaken to develop an appropriate stormwater management program. On the basis of that Plan and other information over time, on June 24, 2002, Town Council received a Manager's Recommendation to proceed to develop the program and passed a resolution to begin the investigation. A copy of the Utility-Based Stormwater Management Business Plan is included in Section 1 of this report.

Utility Development Process

Implementation of a utility is a complex endeavor as many various tracks must be integrated throughout the process. Many of the decisions are contingent upon other decisions. The process being used in Chapel Hill is derived from the overall process depicted in the figure on the next page.

The implementation of Chapel Hill's utility has been developed using a building block approach, with the Town making decisions related to how the utility will operate and how work will be accomplished, with the help of the consultant and a stakeholders group. The process is collaborative and iterative, with one decision leading to the next in a logical order.



The Chapel Hill Stormwater Management Business Plan (completed in 2002) provided the foundation for the process that has been used to develop the stormwater utility. It recommended 14 Steps that have been, or are being followed, toward developing a utility program that will *be legally defensible, provide equity among users, and provide Chapel Hill with a solid and stable funding source for its stormwater management*. The plan called for completing these fourteen steps in two phases, with completion of steps #1 through #7, followed by the Steps #8 through #14.

1. Form a Stormwater Policy Review Committee to review the program and to provide feedback on program and policy issues
2. At the same time, develop a Program Strategy, make policy decisions, with the Stormwater Policy Review Committee input
3. Develop data for establishment of a rate structure, including new aerial photography
4. Perform a Cost of Services Analysis
5. Establish Enterprise Fund and separate Cost Code Centers
6. Perform a Preliminary Rate Study
7. Implement Customer Service Programs, Public Information Program
8. Create the Comprehensive Stormwater Management Program (passage of an ordinance to establish a utility and comprehensive program)
9. Create Master Account File
10. Determine Credit Program
11. Revise Rate Study to match Account File and Credit Programs

12. Continue Implementation of Public Information Program
13. Create Billing Process
14. Create Rate-based Program (passage of rate ordinance)

This approach offers several advantages. First, it has allowed opportunities for the citizens to provide input as the Town Council considers the new stormwater management program changes. Secondly, it separates the revenue generation consideration from the program/service development consideration.

Implementation Process

The work on the implementation of the utility began with the establishment of several working groups within the Town structure. These groups are:

The Core Group – this is a small internal working group responsible for making recommendations that will result in the utility becoming reality; the Core Group consisted of George Small, Director of Engineering; Fred Royal, Stormwater Management Engineer; Engineering; Richard Terrell, Field Operations Superintendent, Public Works; Robert Sykes, Drainage Right-of-Way Supervisor, Public Works; and Maureen Hartigan, Project Manager, Utility Implementation, AMEC Earth & Environmental, along with AMEC personnel responsible for various parts of the project. This team has met several times a month since March 2003 on the various issues to be covered.

The Staff Advisory Group – this group included various Department heads within the Chapel Hill Town staff who are stakeholders in the stormwater utility project by virtue of the potential impact of the enhanced program of services on their operations. The group met on as updates and issues needed to be coordinated. Members included Florentine Miller, Assistant Town Manager; Bruce Heflin, Public Works Director; Bob Avery, Information Systems; Ralph Karin's, Town Counsel; and Bill Stockyard, Public Information.

The Policy Review Committee – this citizens' group was instituted in April 2003 by appointment of the Town Council to provide input and comments on the stormwater management program and to help craft the comprehensive services for the Town of Chapel Hill. The Policy Review Committee's role was to make comment to and provide thoughtful input into policies that impact the Town's citizens. See Section 2 for Committee details.

The use of these and other groups as needed provided the Town with continual involvement of citizens and staff in the development of the process. In this way the process was iterative and recognized the various inputs of many groups.

An important goal for this project was an outcome that creates a program that will be sustainable, that can be managed efficiently, and that supports the changes that are needed in the Town's program. To this end, AMEC with the help of Town staff performed a gap analysis between what is currently provided in stormwater management and what is desired by the community and mandated by law. The process also included determining how the resources can reasonably be managed to build a sustainable program over time. The resulting five-year work plan is based on the strategic goals and the broad priorities defined by the staff and by the Policy Review Committee.

Policy Issues

A series of policy issues that are the foundation for the stormwater program and the utility structure were addressed to establish an appropriate level of service for stormwater management . The issues have been carefully documented since they directly impact the validity of Town Council actions related to the establishment of the enterprise fund and adoption of rates and other funding methods that are associated with it.

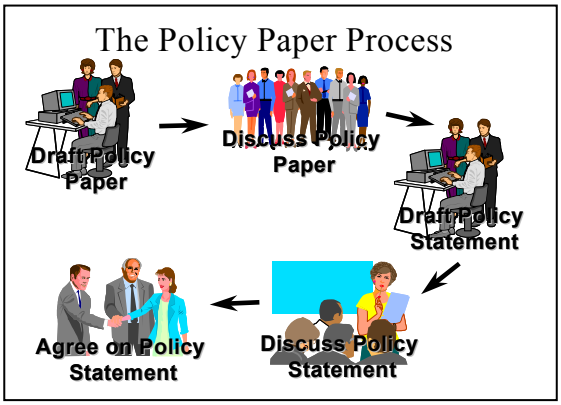
As had been previously noted by other stakeholders groups, there were several gaps identified that Chapel Hill needs to address in a comprehensive stormwater management program, including but not limited to the following key issues:

- There is a defined desire and need for more ability for stormwater program Master Planning. Because of the limited resources and the continuing growth of the population and development in the Town, the ability to have a coordinated and planned program is vital. Such planning includes infrastructure management (i.e., watershed and basin plans for water quality and water quantity controls and strategic business planning for effective program implementation strategies).
- In response to the Clean Water Act, the EPA has issued the National Pollutant Discharge and Elimination System (NPDES) Phase II rules. As a Phase II community, the Town of Chapel Hill must adhere to these regulations and mandates and has applied for a NPDES Phase II permit (March 10, 2003).
- In addition to NPDES Phase II requirements, there is a local, regional and State watershed planning issues needing attention.
- Due to limited resources, the Town is currently operating on a reactive basis for much of its drainage maintenance. There is a need to create objective performance criteria for the drainage system and provide maintenance services in a more proactive manner.
- Chapel Hill has an identified drainage capital improvement needs for various projects. Many other projects likely exist but have not been identified or have not yet reached critical stage for repair or replacement. Currently there is limited dedicated funding for remedial or new construction needs.
- With the diverse community of citizens that resides in Chapel Hill, there is great opportunity for raising community awareness of water quality issues. Currently there is a minimal public education effort, mainly through the Town's website and some community activist groups.
- There are many private residences that have stormwater issues that may react with the public right of way or otherwise impact the stormwater system. Currently the Town has a Drainage Assistance Program that could potentially solve many of the issues for relatively minor investment, but the program has been unfunded for several years.
- The Town participates in the National Flood Insurance Program in good standing. The administration of this program requires increased staff resource needs.
- FEMA –mandated Hazard Mitigation Plans must be developed and adopted by November, 2004 to ensure the Town's eligibility for non-emergency grand funds for property acquisition

These and other like issues, identified over the past decade of study, were taken into account as the five-year resource allocation plan was developed.

Policy Paper Process

The Policy Paper Process is a way to ensure that there is a comprehensive review of important issues and policies relating to the utility implementation. The process is used for both internal operations and for those of community focus. The policy review process begins with a policy paper developed by the consultant that is delivered to the Core Staff Group. The Core Group provides a review and comments to the paper and determines that the policies are in keeping with Chapel Hill's current policies. The discussion paper is provided to other stakeholders (other internal staff, the Policy Review Committee, or the Town management) for review and comment. When the policy paper is agreed upon by all reviewers, it is turned into a policy statement. These policy statements build upon each other, leading to a complete body of work that supports the program and funding strategy ultimately adopted by the Town Council.



The Policy Review Committee plays a pivotal role in providing valuable community input to development of a stormwater program and funding project. It adds a level of rigor and integrity to the decision-making process. The summary report from the Committee's work is found in Section 2 of this report and includes recommendations to the Town related to program priorities, the importance of master planning, recommendations on balance of services that address both water quantity and water quality, potential user fees, rate structures, and other related surface water program issues.

Funding Analysis

The financial analysis to identify resources needed to address the long-range program plan for stormwater followed the structured analytical process employed over the past year. This included the following steps:

- The general nature of stormwater problems and needs in Chapel Hill were evaluated through interviews with Town staff and field investigations.
- Numerous meetings and interviews were held with Town staff to assess the current status of stormwater management activities and associated funding, and identify future needs.
- Program components were identified, and a strategy was developed for growing an effective program. The key components include operations and maintenance, regulation and enforcement, engineering and master planning, public education, capital improvements, NPDES Phase II compliance, and program administration, finance, and support services.
- A full range of funding mechanisms and revenue sources were identified and screened for suitability, including various taxes, service fees, and other funding mechanisms. Nine were deemed potentially practical and subjected to detailed analysis during the Business Plan development and in this portion of the Cost and Rate analysis. Alternative service fee rate methodologies were identified and evaluated.
- Databases and data processing resources were evaluated to determine their usefulness in implementing various stormwater funding mechanisms.

Based on the decade of work of Council appointed committees, in concert with staff, priorities were developed that have been important in the establishment of a business plan and in the definition of a program of services. This portion of work is intended to identify, recommend, and assist the Town in implementing a long-term financial solution for its stormwater management program. This element of the study report focuses on the scope of needed stormwater management services and drainage facilities, the magnitude of associated costs, the funding options available to the Town, and the structure of service fees that could be used to support an effective program for a five-year period. It satisfies due diligence standards and supports adoption, by the Town Council, of a municipal stormwater utility rate methodology and service fee rates pursuant to the authority and powers provided in North Carolina Statutes and the Town Charter.

The full report, found in Section 6 contains the following.

Application of service fees requires a ***Rate Structure Analysis***, which identifies and evaluates methods of apportioning the cost of services and demand on drainage facilities. Five basic rate concepts were examined. Seven modifying factors were identified that might be used to fine-tune the basic rate concepts. In addition, integrating the service fee rates with eight other funding mechanisms was evaluated.

The ***Cost of Service Analysis*** projects the estimated resources needed over the five-year planning period for operating, non-operating, and capital expenses, based on the recommended program strategy. Significant enhancements in the operational program, including Program Planning, watershed master planning and drainage system capital projects can be accomplished in that period. It should be stressed that the stormwater program is expected to extend indefinitely to ensure that the Town's drainage systems are improved, maintained, and operate properly and that water quality is improved and protected. The Cost of Service analysis provides an overview of all the resource needs by stormwater program area. These costs are based on known levels of expenditure currently obligated by the Town as well as the experience of the consultant team and staff in forecasting the anticipated cost of new expenditures to address the planned program.

The ***Rate Study*** describes the rate base available to support stormwater management through service fees in Chapel Hill, and presents pro forma cash flow analyses of four scenarios for the initial five-year period. The recommended rate is $35.04 annually for each 2000 square feet of imperviousness on developed property in Chapel Hill, using a tiered approach for single-family residential properties.

<u>Funding Analysis Conclusions and Recommendations</u>

After evaluating all the funding options available to the Town, we conclude that a user-based service fee is the only practical funding option capable of generating an equitable, adequate, and stable revenue stream commensurate with the program objectives. We recommend that the Town adopt service fees to fund the program. Service fee funding has several advantages, foremost being the equity and flexibility it offers in apportioning the cost of services and facilities across the community, and the dedication of resources that can remove this important priority from competition for limited General Fund revenues. The Town Council can structure the rates to fit the program strategy and achieve a cost distribution they deem to be appropriate.

We recommend a strategy that will enable the Town to stabilize the initial service fee rates while evaluating the rate structure at the end of year 2, once planning is underway and the significance of program elements is defined. We evaluated an option of raising rates in Year 3 and those details are discussed in the full report. **The recommended rate is $35.04 annually ($2.92 a month) for every 2000 square feet (the recommended unit of billing) of imperviousness on developed property with a cap on single family residential rate of 3 billing units.**

Finally, we recommend that the Town continue to pursue other sources of funding from state and federal grant and loan programs and use program funds to leverage these highly competitive grant resources.

CONCLUSIONS/RECOMMENDATIONS

While there are many conclusions that can be drawn from the various elements that are discussed in this report, four important recommendations are presented for consideration:

- A Stormwater Utility needs to be created - There is overwhelming evidence for the need for a stormwater management program that is funded through a utility in Chapel Hill. The enormity of the work to be accomplished and the demands on the Town's funds creates the need for a stable funding source that is not in competition with other Town priorities.
- Continue Citizen Involvement – the public in Chapel Hill is interested and cares about their environment and is supportive of preserving that environment over the long-term.
- Create a strong Public Educations program – many of the problems and issues created in stormwater management come from the fact that the general public is unaware of the potential harm they may be creating through their actions. Stormwater management can be helped greatly by well-informed citizens.
- Continue to build a strong working relationship with the University – we believe it would be greatly in the Town's interest to work with the University to come up with a way to recognize their continuing work on stormwater management and to enlist them in the support of the Town's stormwater management program. It may be possible to develop a credit system that would relieve some of the University's contribution to the utility because of their significant stormwater management efforts.

<u>Summary of Decisions Currently Outstanding</u>

- Billing – AMEC recommends that Orange County Tax billing system be used to bill the fee. If the Town wishes to begin billing for stormwater services for the 2004-5 fiscal year, we recommend that the inter-local agreement process begin with the County.

- Review Standing Committees/Board – Distribution of this report to and a review by standing Committees and Boards should be completed over the next 45 days.
- Ordinance Adoption –Adoption of an ordinance defining the utility structure, the program of services to be addressed, and the rate structure should be adopted during the normal budget process, along with appropriation of the first year operating budget that is supported by the user-fees from the utility.

Business Plan

Town of Chapel Hill

Pro Forma Business Plan –
Utility-Based Stormwater Management Program
I-1 Program and Issues Assessment

Introduction

The Town of Chapel Hill is located primarily in Orange County and slightly in Durham County in the north central portion of North Carolina in the Piedmont Plateau, approximately equidistant between Washington, D.C. and Atlanta, Georgia. As of July 2001, the Town's population is 51,600. Chapel Hill is the largest town in Orange County, which has an estimated population of a little more than 118,000 and a projected population of 147,800 by the year 2020.

Land Use

- Chapel Hill is nestled in the rolling, wooded hills of North Carolina. The town is ideally situated in the state, three hours from the coast and three hours from the mountains, allowing residents to enjoy a variety of recreational activities.
- Chapel Hill, along with Raleigh and Durham continually receive accolades for being a top location to live and do business. Most recently the A & E television channel recognized Chapel Hill as the #2 city in their "Top Ten Cities to Have it All." Previous accolades have included *Money* magazine's selection of the Triangle as the "#1 Best Place to Live in America," *Fortune* magazine's rating of the Triangle as #1 for "The Best Cities For Knowledge Workers," and *Sports Illustrated*'s nod as the "number one college town in the United States."
- The Town is the home of the University of North Carolina at Chapel Hill, the nation's oldest public university, established in 1789. Today, the University enjoys a reputation as one of the best public universities in the United States.
- The area of the Town is 20.16 square miles.

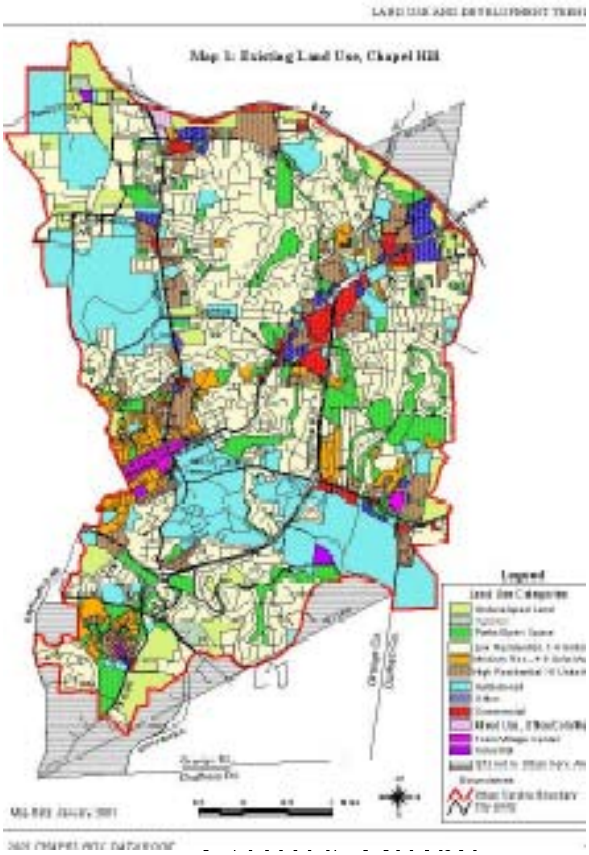


Figure 1 Map of Chapel Hill

- Chapel Hill's land use patterns are profoundly influenced by a policy enacted in 1986. This policy established an Urban Services Area, the area within which growth is expected to occur at urban intensities using Town standards. The Town has extended urban services within this area, and is annexing all land within the area as it develops and qualifies for annexation. The eventual ultimate boundary of Chapel Hill shall be identical with the established Urban Services Area boundary. The Town will not extend any urban services beyond this boundary; will not annex beyond this boundary; and plans to maintain very low densities of development in a Rural Buffer that surrounds the Urban Services Area. This is a fundamental Town policy to which the Town has strictly adhered since it was enacted.

Figure 2 Downtown Chapel Hill

The Existing Land Use Map, Figure 1, shows current land uses in the Town's Urban Service Area and Transition Area. There are approximately 12,900 acres within the Town limits. The Urban Services Area includes about 16,000 acres.

The Town maintains a small-town feel with the downtown the center of activity. The presence of the University of North Carolina lends a distinguishing quality to the Town in keeping with its history.

The predominant land use is low to medium density residential use, comprising nearly half the Town. The second largest category is institutional use, which includes the university and includes almost 20 percent of the Towns land. Privately owned commercial, office, mixed-use, and industrial areas combined, total approximately 5 percent of the Town's land. The amount of commercial space (office, retail and warehouse), measured in terms of square footage, has increased by about 18.5 percent in Chapel Hill since 1992.

Planning

The Town conducts an ongoing planning and programming process through which it implements orderly expansion and management of the growth and development of the community. At present, the Town exercises zoning and building controls over a 27.5 square mile area that includes the corporate limits and a 7.36 square mile planning jurisdiction.

The growth of the Town has been directly related to the expansion of the University of North Carolina at Chapel Hill. Enrollment at the University has risen from 8,791 in 1960 to 24,872 in 2000. It is anticipated that expansion will continue to occur in University-related health facilities such as the University of North Carolina Hospitals. The University and its hospital continue to be the town's largest employer.

Government

Incorporated in 1819, the Town has a Council-Manager form of government. The Town Council is comprised of a Mayor and eight-member Council. All Council Members serve four-year terms. The Mayor and four Council Members are elected every two years. All elections are on a non-partisan basis and at large. The Council appoints the Town Manager and Town Attorney. The Mayor presides over the Council meetings and has full voting privileges. The Town Manager is the chief administrative officer of the Town. Town departments are responsible to

the Town Manager for the provision of public services. The Town is governed by a Code of Ordinances that contains the Charter of the Town of Chapel Hill, and lists the duties and responsibilities of its elected officials, Town officials, Town departments, and advisory boards. Town Council meetings are normally broadcast live over the Time-Warner Cable channel 18.

Financial

The financial condition of the Town is solid. It has a Triple A rating from Moody's, a Double A rating from Standard & Poors, and debt obligation under 1%.

- Currently, general fund revenue comes from the following sources:

Table 1. Sources of Current General Fund Revenue (2000-01)

Source	Amount ($ millions)	% Of Revenues
Property Taxes	16.1	48.3
Other Taxes	0.9	2.6
Licenses, Permits, Fines	1.4	4.2
State-Shared Revenues	10.9	32.8
Grants	0.5	1.4
Service Charges	1.0	3.0
Interest on Investments	0.6	1.8
Other	0.2	0.7
Interfund Transfers	0.9	2.7
Appropriated Fund Balance	0.8	2.4
Total Revenues	33.3	100.0

Source: Town of Chapel Hill

- Nearly half the land in Chapel Hill is devoted to low to medium density residential use. This will have a positive impact on the revenue-generating potential for stormwater user fees although it is clear that there will be concern as well about a new fee, in light of a 6.6 cent proposed tax increase from the Town for the next year as well as a tax increase from Orange County.
- About 20% of the land use base is non-profit organizations, in particular UNC-Chapel Hill and the University Hospital. Since the University may be reluctant to participate in the program, this issue must be handled carefully if a user fee based on impervious area is to be established. It will be important to ensure it is clear that this is not a tax but a user fee. Since the University has been involved in several of the stormwater advisory committees over the past several years, past knowledge of the potential for a user fee will be beneficial.
- A substantial increase in multi-family units over the recent past presents a separate challenge, as these units are either condominiums in which the separate owners must share a fee, or rental units in which a commercial owner will carry the user fee.

Current Stormwater Program

The current stormwater program can be categorized as a "minimal" program, as compared to other communities of similar size. Due to resource constraints, the Town is often in a reactive

mode in terms of system maintenance. Current work programs include routine drainage system inspection and maintenance, street sweeping, removal of debris from three major waterways within Town, small drainage improvement projects, drainage assistance to private property owners, and inclement weather flooding response and recovery. The Drainage Assistance Program is the one program that exists to address issues on private property. However, there is no clear policy in place about how maintenance will be performed, or who will maintain or pay for continuing maintenance.

Currently (2000-01) the Town allocates about $950,000 in operating funds (including some salary costs) to stormwater management divided into the following categories:

- Engineering $250,000
- Drainage, maintenance and sweeping $700,000

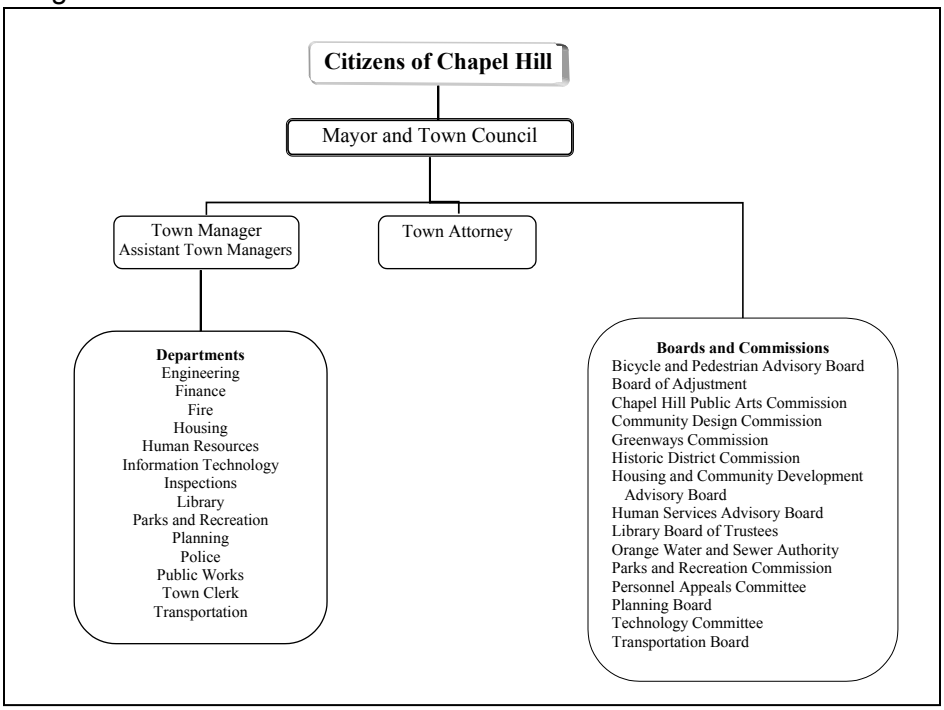
The current stormwater management program is handled between two Departments, Engineering and Public Works.

Engineering

The Town Engineering Department's principle role in stormwater is responsible plan review, including stormwater infrastructure associated with development activities. For projects funded directly by the Town, they will conduct field reviews of small projects to assist with the decision to undertake in-house design activities. In some cases, they may be called upon to go with the Public Works personnel to diagnose a problem. They are staffed with a Stormwater Engineer, and a part-time, temporary position entitled Engineer Intern. The Intern has served many roles, including performing water quality monitoring, miscellaneous GIS database work, elementary school education, North Carolina Big Sweep (annual stream cleanup) coordinator, general assistant to the Stormwater Engineer with projects. In addition, the Department has had two technicians who have assisted during the summers with the completion of the storm sewer inventory program and gathering GIS data.

Public Works

The Right-of-Way/ Drainage section of the Field Operations Division within Public Works primarily performs Stormwater maintenance. Some assistance is also provided by the Construction and Streets sections within the Field Operations Division. The Public Works Department sets priorities and provides the maintenance and operations resources to the stormwater



management program. Section managers have a list of guidelines and standards on maintenance of drainage and right-of-way areas, and keep records of daily activities.

Maintenance

There is one work crew that is designated to focus on stormwater and drainage. Due to the limited staff and other pressing needs, the crew currently does not spend 100% of its time doing stormwater type activities. The crew is made up of three individuals, who have several pieces of equipment available to them. Crew cost is estimated to be approximately $140,000 per year; equipment cost is approximately $40,000. Total crew cost is $180,000 annually.

Capital Construction

In 1996 the Town issued Street Improvement Bonds allocated for drainage projects of $500,000; $453,491 of the bonds have been spent, leaving a balance of $46,409. In addition, the Town has identified more than $252,000 in unmet drainage improvement capital projects and a second list of drainage assistance capital projects where the dollar values have not been determined. For reference, just two of the major current needs (assistance to Eastgate Shopping Center and Burning Tree Drive) require funding of more than double the funds available from the bonds. There do not appear to be any other funds earmarked to handle another emergency if it arises.

Stormwater Problems and Issues

Overview

City staff has described the current approach being taken to address stormwater management as often reactive. The stormwater system has evolved over the course of many years – well beyond the anticipated useful life. The aging drainage infrastructure, some of it over 60 years old, may require significant maintenance, replacement and/or improvement in coming years to comply with water quality requirements, to mitigate flooding problems, and to safely convey increasing quantities of stormwater runoff.

The system has not received the resources it has needed, both in terms of capital construction and maintenance. Thus, collapsing pipes, nuisance flooding, erosion, gullies, broken headwalls, clogged systems, undersized systems, etc. are likely to occur within the drainage network. Without additional attention and investment, the system will become more antiquated every day.

Additional resources become even more necessary as Chapel Hill and other local governments are facing increasing stormwater quality requirements due to NPDES (National Pollutant Discharge Elimination System) regulations as well as other State and local regulations regarding soil erosion and sedimentation standards.

Complaints

Chapel Hill has a serious commitment to citizen satisfaction. At the same time, there is considerable anecdotal evidence that stormwater is a serious issue for the citizens of the Town. Until the Stormwater Management Engineer was hired in March 2000, there was no long-term tracking of complaints, thus trends and repeat calls are not recorded and cannot be analyzed to obtain a comprehensive picture of conditions within the Town. The Town estimates they currently receive approximately 50 stormwater related complaints a year, mostly about drainage

water (quantity). In addition, the Town receives approximately four formal petitions from neighborhood groups or associations with requests for larger projects each year. These have included a request for assistance for stream bank erosion and flood mitigation assistance, assistance with funding the replacement of obsolete major infrastructure draining public property runoff through private property, assessment of the watershed above a man-made impoundment to determine how to reduce severe deposition of sediment in a lake and ways to improve the lake, and assistance with on-going flooding problems at an apartment complex. Also, citizens raise drainage issues with Town Council at many of their meetings.

It appears that both Engineering and Public Works are strongly aware of the issues existing around drainage issues. Public Works has segregated types of complaints into: public infrastructure, public maintained streams, high water problems, North Carolina Department of Transportation (NCDOT) public infrastructure, and private property.

The complaints are tracked by Engineering and most are re-directed to Public Works. The issue is reviewed and a decision is made if maintenance crews can address it. If so they schedule the work. If not, the *Citizen Request for Assistance* is forwarded to the Town Engineer with a recommendation.

Complaints that are easy or relatively inexpensive to fix or where timeliness is important to prevent a bigger problem have a better chance of being addressed than problems whose solutions are complex. It should be noted that, while issues revolving around NCDOT public infrastructure are referred to the Town by a citizen and relayed to NCDOT for them to handle, the public typically does not understand the differences between Town and NCDOT roadways and recognize only that their complaint has not been handled in a satisfactory way.

It is likely that many property owners may simply have given up calling due to the inability of the Town to address their problems under current policy and resource allocations. A new stormwater fee would likely stimulate them to try again to obtain relief from the Town.

Stormwater Management Tools

The Town lacks up-to-date maps of the drainage system, and thus does not know the current condition of the system or its adequacy for managing future growth and demands. Master plans have not been completed for each watershed, limiting the Town's ability to be proactive in addressing both water quality and water quantity issues. Regulation of the system is a key role for the Town and currently there are not appropriate policies in place to obtain access to all parts of the system and to provide routine and remedial maintenance at a level commensurate with the need. In many areas, drainage easements do not exist, or if they do, are not identified to allow for access to off street right-of-way portions of the drainage system that cause many problems. There is no clear policy regarding who is responsible for maintenance of easements.

Program Priorities and Planned Program Changes

Program Priorities

To date (from 1992 through 2001) there have been three separate Stormwater Advisory Committees looking at the Town's stormwater management program. Each established a set of goals for the stormwater program. The issues raised above and at the Committee level show that the primary program priorities fall into six key areas:

Table 2. Stormwater Program Priorities

Program Area	Program Priorities
Administration and Finance	• Develop stable, adequate and fair funding for the stormwater program • Establish additional policies regarding the maintenance of 'private' drainage systems • Improve public education / information about stormwater • Develop cost allocation system for the stormwater program
Planning and Engineering	• Develop an accurate physical inventory of the drainage system • Identify and prioritize key problem areas • Master plan systems, areas of new development, significant redevelopment, and "problem" areas • Develop a prioritized capital improvement program • Upgrade design standards and development guidelines • Integrate stormwater master planning with urban greenway planning • Seek to coordinate standards with the County. • Develop standard for proper catch basin covers and replace
Operations and Maintenance	• Develop a systematic drainage system rehabilitation program • Implement an effective preventive maintenance program • Be more responsive to drainage complaints • Extend maintenance to off right-of-way areas • Be more proactive in generating Work Orders by inventory information and field inspectors • Perform maintenance on a proactive watershed basis
Regulation and Enforcement	• Plan for and execute compliance with State and Federal regulations (sediment and erosion control / NPDES) • Improve maintenance of private systems (on site detention) through increased enforcement
Water Quality	• Track impacts of NPDES stormwater permit • Develop and implement water quality strategies as appropriate
Capital Construction	• Resolve backlog of capital construction needs

Comprehensive Program and Cost Estimates

It is clear that there will need to be a "ramping up" period in the development of the comprehensive stormwater program for Chapel Hill. One-time activities (which may require lesser ongoing activity) such as conducting a system inventory, performing master planning, and developing a capital construction prioritization methodology will be performed on the front end of the proposed management program, and then used and maintained as tools throughout the life of the program. Caution is advised that the program concentrate on a balance of fixing

and planning. If all the initial funds go toward planning and inventory activities without a demonstrated improvement in the service, the program and staff will fight an uphill public perception battle. At the inception of the expanded program, long standing drainage problems should be targeted for repair – even the very day the first bills go out, if a utility is implemented. Initial impressions are lasting.

Stormwater Utility Implementation

Among the first activities that should be undertaken would be reconstitution of the Stormwater Advisory Committee. This Committee would now be charged with going past the theoretical discussions that previously took place and provide input on the Town's specific policies on the mission of the program, short term and long-term program priorities, level and extent of service, rate methodology, and cost of service. They would be asked to voice their opinions and come to consensus on the balance of cost versus services on behalf of the citizens of Chapel Hill.

Full consideration needs to be given to the structure of the stormwater utility, including a consideration of the additional services and structure associated with running a stormwater utility. Although the impact to the existing structure of starting a utility will be significant, it is common to find that even without that change, the organizational responsibility for stormwater management is too diffuse in its current form. With or without a utility, it is important that one person has responsibility and accountability to manage the stormwater program, to marshal resources, and to set its priorities.

Based on the stormwater program priorities developed above, a stormwater program budget was estimated to address key issues. The estimate is in very broad terms for the purpose of establishing the potential feasibility of stormwater user fee funding for a viable program. It is for a period out several years after one-time activities have taken place. It is in addition to the current $950,000 spent on the program and includes building an appropriate NPDES compliance program. The following table lists the major cost items:

Table 3. Proposed Program Costs (New Funds)

Program Area	Program Cost (Low)	Program Cost (High)
Administration and Finance	$200,000	$200,000
- Indirect allocations and billing costs		
Engineering		
- Master planning and system inventory	$250,000	$500,000
- Inspection/Regulation and enforcement	$50,000	$50,000
- Water Quality	$187,500	$187,500
Operations and Maintenance	$250,000	$250,000
Capital Construction	$200,000	$400,000
Totals	$937,500	$1,387,500
Current Budget	$950,000	$950,000
Projected Total Annual Spending	$1,887,500	$2,337,500

This amounts to at least doubling of the stormwater resources in Chapel Hill. Highlights include:

- Adding $187,500 annually to meet NPDES Phase II water quality and other regulatory program needs. This number is based on previous experience with municipalities of approximately the size of Chapel Hill, and does not differ substantially from the numbers presented February 11, 2002 to Town Council in the *Manager's Follow-up Report on Recommendations of the Stormwater Utility Development and Implementation Study Committee*.

- Adding to the annual capital improvement budget with a goal of working off the major capital and remedial needs until the backlog is worked down to a more manageable project list. This amount would change as Master Planning is completed and better information becomes available on the actual needs and the effectiveness of the program.
- Adding at least one totally dedicated maintenance crew along with equipment. It will take a year or so to create this resource, based on acquisition of equipment and hiring activities. There is a concern that the current assets dedicated to stormwater management will be pulled off for other duties when another fully dedicated stormwater crew is formed. Resources provided through a dedicated funding process will ensure that the drainage issues are addressed and that the other maintenance priorities will be covered through currently budgeted General Fund revenues. This must be accomplished or else the level of service will remain the same as prior to an identified stormwater charge, but the level of public demand for stormwater services will be significantly higher. This will result in a public dissatisfaction with the program.

Program Related Issues

Development of a stormwater management program funded through a dedicated user fee presents several issues:

- The need to educate the public about the needs and to gain their support
- The need to identify and gain the support of key stakeholder groups
- Handling and gaining the support of tax exempt property owners
- Convincing non-residential property owners that a stormwater user fee is fair and logical
- Determining internal organization and accounting changes to handle the new approach to stormwater management
- Addressing issues such as ability to pay

Each of these issues is commonplace in the development of stormwater management user-fee programs. The way these have been successfully dealt with in other communities is through a combination of:

- Effective public education and awareness
- Special efforts toward specific stakeholder groups

- Consensus building with a representative citizens group
- A well-thought-out logic as to why the user fee is the best way to go
- A fair and generous credit program
- A technically sound rate structure and approach
- A legally sound approach
- An approach that political leadership can buy into with minimized risk

Each of these points will be dealt with if, and when, the user fee-based program proceeds beyond the feasibility stage. The logic for setting up a stormwater management user fee can follow along the following line:

1. The stormwater related problems are real, under-funded, and generally unresolved.
2. We can develop and implement a plan to resolve them.
3. Government must take the lead.
4. Benefits will result.
5. It will cost more to do this for the community.
6. A stable, adequate and fair funding method is necessary.

Town of Chapel Hill

Pro Forma Business Plan –
Utility-Based Stormwater Management Program

I-2 Basic Funding Feasibility

Purpose

This section presents a recognizance-level assessment of the feasibility of funding Chapel Hill's stormwater program through an enterprise fund supported primarily by service fees. Many other North Carolina municipalities including Greenville, Rocky Mount, and Gastonia have initiated similar actions within the past few years, building on the experiences of hundreds of communities nationwide that have established such programs since 1974. The feasibility of other funding methods that might be an alternative to or complement service fees is also examined.

Conclusions on Funding Feasibility

Given the basic status of Chapel Hill's current stormwater management program, the Town clearly faces a significant "program development curve" in the next few years as administrative, operational, capital investment, and regulatory elements of stormwater management are formulated and carried out. It will take five to ten years before a comprehensive program is fully attained, and perhaps twenty years or more to plan, design, and build major capital improvements.

Funding should be expected to evolve along with the program. Throughout that time frame there may be several funding methods both primary and secondary to support various aspects of the stormwater program. Full implementation of secondary funding mechanisms associated with a stormwater enterprise fund may therefore require ten years or more.

Advantages of a Service Fee.
This feasibility assessment concludes that a comprehensive stormwater management program funded primarily by service fees offers more flexible, stable, and equitable long-term stormwater management funding for Chapel Hill than any other option. It is clear that a service fee has several significant advantages over other funding options. It is highly flexible, offers the prospect of stable funding over time, allows restrictive dedication of the revenues to stormwater management only, and enables elected officials to craft an equitable distribution of costs through a service fee rate design. A service fee rate structure can allocate costs based on the demands placed on the systems instead of property value or other factors unrelated to stormwater service needs.

A stormwater service fee has sufficient revenue potential to assure consistent funding at a level that would support development of a comprehensive program. State statute provides a mechanism to the Town authority to raise revenues in this manner. However, the Town must also support numerous other municipal services that do not lend themselves to user fee funding (such as public safety, street maintenance and fire protection). Stormwater service fee funding could relieve, partially or wholly, the demands that stormwater management now

places on the General Fund. Moving the stormwater management to a different revenue arena would alleviate some of the conflicting priorities now placed upon the budget.

Stormwater management service fee revenues can be used for any activity or improvement related to stormwater management, including revenue bond service debt for major capital investments. The use of revenue bonds could enable Chapel Hill to expedite major improvements to the stormwater systems without reducing its general obligation bonding capacity for other purposes.

Priorities change over time, and the ability for funding to change in concert with needs is critically important. A service fee rate methodology can be periodically adjusted along with major transitions in programs and priorities, especially in terms of system improvements. Other funding methods differ in their suitability for capital, operating, regulatory, and other types of costs.

Disadvantages of a Service Fee.

The major disadvantages of a service fee are that it costs money to implement and new fees might be politically unpopular. The cost of implementing a service fee is expected to be $340,000 (excluding $150,000 is new photography), depending on many decisions yet to be made by the Town. To put this cost in context, this represents less than six months of service fee revenue, depending on the ultimate rate structure.

Political acceptance is more difficult to forecast than implementation costs. Public reaction to stormwater service fees elsewhere has ranged from very positive to very negative. Given the extent of local drainage problems and need for drinking water quality, one might conclude that the community would be receptive to a workable long-term solution. A program and funding strategy that offers a realistic prospect of solutions will have to be communicated convincingly to gain public support for the approach.

Issues

If the Town Council chooses to establish a stormwater service fee it will have to address both institutional and funding issues. These include whether to establish a separate stormwater organization or integrate a stormwater management service fee funding to support the existing organization structure using separate cost centers to preserve the segregation of the revenues.

The Town Council will also have to decide how to structure stormwater service fees. One or more ordinances will have to be drafted and adopted. The experiences of other cities and counties suggest that an intensive public information effort should be conducted to explain the stormwater service fee concept to the community.

Institutional Arrangements

While this business plan is for only the Town of Chapel Hill, it is possible that other communities such as Orange County or Carrboro may want to consider joining with Chapel Hill in the utility. In that eventuality, a service fee could be applied, enabling more effective management of the many drainage systems that flow into and out of the Town.

Process and Schedule

A dedicated stormwater enterprise fund could be in place (as an accounting entity) as early as January 1, 2003. However, the work required to design a suitable service fee rate methodology, prepare a master account file, and adjust the existing billing systems or develop

a new system could require at least another nine to 18 months (see *I-3 Basic Data Feasibility* section). The actual schedule would depend on many decisions yet to be made, such as the service fee rate design. Additional information concerning implementation steps and schedule are contained in the *I-4 – Approach Development* report.

While the program can be planned to be in place at the beginning of 2004 or sometime during calendar year 2004 a stormwater enterprise fund could assume some stormwater management costs beginning in fiscal year 2003. The Town would have to find other revenues to pay for costs prior to the initial service fee billing. This could possibly include General Fund appropriations or interfund loans from other funds (General Fund balance).

What is a Stormwater Utility?

A stormwater utility can be seen as an umbrella under which individual communities address their own specific needs in a manner consistent with local problems, priorities and practices. With the expected needs for increased stormwater management programs, the stability, flexibility, and adequacy of a utility provides a great advantage over other financing methods.

Program Driven Structure

Stormwater utilities are comparable in many ways to more traditional municipal water supply and wastewater treatment utilities. Nearly all involve management of a complex system of natural and man-made physical structures, and demand continuing operational and regulatory programs as well as capital investment in the systems. Because of previous and recent federal and state mandates, most provide a comprehensive program that addresses water quality as well as quantity (flood) control. The programmatic needs eventually dictate the utility structure and function.

A stormwater utility can provide a vehicle for:

- consolidating or coordinating activities and responsibilities that were previously dispersed among several departments and divisions;
- generating funding that is adequate, stable and equitable, and dedicated solely to stormwater management ; and
- developing programs that are comprehensive, cohesive, and consistent year-to-year.

A stormwater utility provides an organizational focus for a comprehensive program such as that projected for Chapel Hill. The utility approach also offers a means to properly fund such a program through service fees. However, a utility service fee is not necessarily the only funding solution available to the Town. Many cities implementing stormwater utilities in recent years have discovered that it is desirable and/or necessary to use more than one funding source to generate sufficient revenue in a way that is equitable and publicly acceptable. Thus, the source or sources of funding to be used is a core issue to be resolved in assessing feasibility and formulating a strategy.

What is a Stormwater Utility?

- ***A FUNDING METHOD***
  A method or mix of methods for providing adequate, stable, and equitable funding for the comprehensive stormwater program.
- ***A PROGRAM CONCEPT***
  A comprehensive stormwater quantity and quality program with an effective balance of: capital, operational, regulatory, engineering, planning and administrative activities.
- ***AN ORGANIZATIONAL ENTITY***
  A legal entity with the authority to regulate stormwater management, operate stormwater management systems, and assess fees and charges.

A stormwater utility user fee methodology is **equitable** because the cost is borne by the user on the basis of the user's demand placed on the drainage system. A stormwater utility is **stable** because it is not as dependent on the whims of the annual budgetary process as taxes. A stormwater utility is **adequate** because a typical stormwater program can be financed with payments below what the normal customer is willing to pay.

Most communities find that their particular problems and needs demand a stormwater rate methodology that is tailored specifically to the local situation. No standard definition is adequate and no "cookbook" approach to funding stormwater utilities exists. Thus, the descriptions of stormwater utility funding concepts in this report should be viewed as general guidance only. The details of the funding strategy and the rate structure that best fits Chapel Hill's needs will require a more detailed analysis if the Town decides to proceed with implementation.

Basis for a Stormwater User Fee

Stormwater utilities typically generate most of their revenue through "user" fees. "Use" of the stormwater system is defined as the demand a property places on that system and the stormwater services and facilities provided which protect the property, downstream properties, and the receiving waters. Each property generates stormwater runoff that requires action by the community to provide services to ensure safer streets, cleaner water, etc. Demand is traditionally measured in terms of the peak flow of stormwater runoff generated by the property. The greater the flow, the greater the demand, and thus the greater the user fee. Sometimes the volume of runoff and runoff pollution are also included in the rationale for the user fee structure.

Two major parameters that most significantly influence the demand that a property places on the stormwater system are total property area and total impervious area within a property. A shopping mall or a University campus has a larger impact than a single-family residence, and consequently, should pay a larger amount than the residence. Many stormwater user fees do not consider total area since undeveloped property may presently have no more impact than it had before the municipality was established. Others choose to include undeveloped area, reasoning that most drainage systems are designed and built with future as well as current service demands in mind.

The financing approach developed for a particular utility is called the "rate methodology". The rate methodology is divided into three modules:

1. the basic rate methodology;
2. modification factors which can be applied to any of the rate concepts to enhance equity, reduce costs, and meet other objectives; and
3. the secondary funding methods that can be adopted in concert with the service charges.

The basic rate methodology serves as the technical foundation for the user fee charge, and different approaches have advantages and disadvantages. Basically, the user fee reflects the amount of stormwater runoff discharged from a property, as influenced by the conditions on each property or class of properties. It may also reflect the "service" rendered to a property as a result of adequate control of upstream runoff and assurance of mobility and accessibility during and after storm events. Typical methods for calculating demand on the system and the associated fee typically consist of the following:

- impervious area;

- impervious area and gross area;
- impervious area and impervious percentage;
- gross area and an intensity-of-development factor; or
- gross area with modifying factors.

Secondary funding methods (discussed in the next section) and modification factors are used to enhance equity or improve ease of utility implementation and management without unduly sacrificing equity.

Typical modification factors might include:

- a flat rate single-family residential charge;
- a base rate for certain costs which are fixed per account;
- basin-specific surcharges for major capital improvements; or
- credits against the monthly service charge for properties that have on-site detention/retention systems or best management practices.

Feasibility Assessment of Funding Options

Eleven funding mechanisms were examined during the assessment that might partially or wholly fund stormwater management in Chapel Hill. The first two, the stormwater service fee and the Town's General Fund are recommended as ways that offer revenue generation capability to support the projected program needs. Other "secondary" funding sources considered in this analysis are not recommended as funding methods. These include special assessments, special service fees, bonding, in-lieu-of-construction fees, system development charges, impact fee, and federal and state grants and loans. Although some of these might offer suitable and sufficient funding for specific elements of the stormwater program (e.g., bonding for capital projects), none has the capability of being the primary funding source for the long-term program. Thus, this report focuses on the stormwater service fee and General Fund options.

1. General Fund Appropriations

The stormwater management program in Chapel Hill has been funded from Town's General Fund. The General Fund clearly has sufficient revenue to support an increase in stormwater management funding either through a reallocation of current resources or tax increases, though neither option is likely to be popular.

The greatest inequity in using General Fund appropriations for stormwater management in Chapel Hill is that many properties that place demands on the stormwater systems are exempt from general taxes. For example, the University, government agencies, churches, and others do not generate property tax revenue. As a result they do not participate in funding stormwater management through the General Fund. Even some private properties, for example parking lots and storage warehouses that have large expanses of impervious coverage, do not pay taxes commensurate with the demands they impose on the stormwater systems. Conversely, some properties have little impact on stormwater runoff but pay substantial property taxes. They are paying proportionately more for stormwater management through the General Fund than they would through funding methods based on the demands placed on the stormwater program and systems.

General Fund appropriations are uncertain from year to year. Revenues within the General Fund are not dedicated to any specific purpose, and allocations shift with perceived priorities. Stormwater management needs are likely to receive better treatment in the budget in a year following severe storms and drainage problems than in a year following a drought. This makes it difficult to plan and consistently carry out a long-term program plan that depends on reliable funding year after year.

2. Stormwater Service Fees

Under North Carolina General Statutes Chapter 160-A municipalities are enabled to conduct stormwater management as a utility function. Specific methods of funding stormwater management are not mandated. Stormwater service fees are within Chapel Hill's authority, and could distribute the cost of stormwater management across the community as deemed appropriate by the Town Council.

The Town Council has broad latitude to structure the institutional arrangement underlying a stormwater service fee as it sees fit. It would appear that a service fee could be established either independently under a stormwater utility or within OWASA's existing utility structure. If stormwater were incorporated into the OWASA operation it would be appropriate to have a separate fee based on a stormwater rate methodology supporting a separate cost center. It is almost certain that the covenants associated with OWASA's operation presently in force would dictate that an "arm's length relationship" be established and maintained between stormwater and their services. The other North Carolina cities that have established stormwater utilities have kept them separate from other entities.

Simplified residential rates are common, with many stormwater service fee methodologies having a flat-rate charge for all single-family residential properties. Service fee charges to non-residential properties are normally higher than residential charges, reflecting the greater runoff they typically generate. An "equivalent unit" approach is often used to equate service fees on non-residential properties to the rate applied to residences. Monthly residential rates typically range between $2.50 and $4.50, although a few very advanced programs charge more than $15.00.

The revenue generated by a stormwater service fee is a function of the design of the rate structure and the make-up of the community. Based on the experiences of comparable communities, a typical rate structure might be expected to generate between $20 and $40 per gross acre annually for each $1 per month billed to residential properties.

A stormwater service fee established under a stormwater utility could be coordinated with other funding methods. Revenue from service fees and other types of fees examined in this report (and even allocations of General Fund resources) can be melded to tailor the distribution of costs as the Town Council sees fit. North Carolina law does require, however, that the rate methodology be applied to all properties within the Town, so it is not possible to selectively use the utility approach in a limited area. In other words, all properties of a type must be treated equally.

Equity of funding can be enhanced through the service fee rate design process. For example, stormwater service fees may be applied to non-taxable (public) as well as privately owned properties. Taxable (private) properties are thus relieved of a portion of the cost of stormwater management. Credits can be given against stormwater service fees to encourage and reward responsible stormwater management such on-site detention of runoff, and to compensate for

activities performed by the property owners, which are beneficial to the stormwater management program.

The stability of revenue from a stormwater service fee ensures that long-range scheduling of capital improvements and operations can be done with reasonable assurance that funding will be available. This would overcome one major problem that currently exists. Dedicated funding that cannot be diverted to other uses also encourages stewardship of the resources.

Another advantage of a stormwater service fee would be to free up General Fund resources for other purposes. Shifting financial responsibility for stormwater management to a stormwater utility and instituting a stormwater service fee to fund all or a portion of the stormwater management costs would make more General Fund resources available for other needs.

The biggest potential disadvantages of a stormwater service fee are its high visibility and the cost of development and implementation. Regardless of technical distinctions between "taxes", "extractions", "assessments", and "service charges", any form of government funding will be viewed by a majority of citizens and property owners as a "tax" and will thus be potentially unpopular. In Chapel Hill's case, because of the work that's already been done with public groups on stormwater issues, the higher degree of visibility associated with a separate fee might actually be a plus. The community already sees stormwater as an issue and this is a serious effort to fix long-standing flooding problems and reduce stormwater pollution.

3. Special Assessments

For many decades capital improvements to stormwater drainage systems were commonly funded through special assessments upon benefited properties. This approach evolved from historic English ditch law concepts originally conceived to pay for drainage of farmlands. The assessment concept was predicated on allocating drainage costs to the farmers in proportion to the direct and special benefits they individually derived in the form of increased crop yields and grazing use. This led to methodologies that were associated with the value of the enhanced use of the land rather than the demands placed on the drainage systems. The ditch law assessment concept was transferred to the United States from England along with many other local government-funding practices. In time it was translated into "special assessment district" funding, and was eventually applied to many other capital improvements needs in addition to drainage.

The inherent shortcomings of special assessment funding as applied to stormwater drainage systems in an urban setting have become increasing evident in recent years. The chief drawback of the traditional special assessment methodology is that the distribution of costs must be proportionate with the direct and special benefit accruing to each property being assessed. The benefit must be definable, measurable in some economic manner, and available to the property being assessed within a practical timeframe. General benefits accruing to all properties as a result of a stormwater improvement cannot be used to justify a special assessment, for example better traffic movement along roads that are not frequently flooded.

The courts have established substantially different standards for service fees versus special assessments. Great latitude is given to local elected officials in setting service fee rates, but special assessments must comply with more restrictive technical standards based on

individual benefit. Fully complying with the standards the courts have set for special assessments requires more precise and costly data than is needed to support a service fee, which must simply be fair and reasonable in its general application.

As a result special assessments for drainage are most workable in a very localized application. 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 less suitable for capital projects that serve a wide area, and wholly unsuited to facilities providing a general service (or benefit) to the community at large as compared to specific individual properties. Because so much of what must be done to effectively manage stormwater quantity and quality in Chapel Hill is not directly and specially beneficial to individual properties, assessments are not workable as the prime source of funding for the stormwater management program strategies described in this report.

The pressure to identify new funding methods has increased as assessments have become less and less suitable for stormwater management programs and projects in recent years. The emerging "watershed" orientation of stormwater master planning and improvements accentuates the limitations associated with special assessments. Advent of an increasing local government role in stormwater quality management has further eroded the usefulness of special assessment funding, since it is extremely difficult to demonstrate the direct and special benefit of stormwater quality management to individual properties.

Under a utility a special service fee can be used instead of a special assessment to isolate certain costs to a limited number of properties or persons served by a specific capital improvement or program activity. A special service fee is much more flexible than an assessment, can be applied to large areas as well as small, and does not have to meet the more rigorous tests applicable to direct and special benefit allocations. Instead, a special service fee adopted under the umbrella of general ratemaking practices must adhere to the standards generally applied to service fees. The rate methodology for a special service fee must be fair and reasonable, and the resulting fees to individual persons or properties must bear a substantial relationship to the cost of the facilities or services, but it need not consider direct and special benefit.

When employing special service fees in situations where special assessments might have been used in the past, it is vitally important that a consistent approach be applied. A level of service provided to one portion of the service area and funded through the normal service fee should not be subject to a special service fee in another portion of the service area unless the long-term cost for that comparable level of service is clearly so different that a special fee can be justified. Just as wastewater utilities do not charge customers located farther from a wastewater treatment plant a premium over those located nearby, special service fees are rare except in cases when significant differences in the cost of providing a comparable level of service exist. The other circumstance in which special fees are sometimes used is when a capital improvement is expedited apart from normal priorities or is designed and built to a higher level of service than normal. The departure from normal priorities or service level can be translated into a special service fee. The drawback to such practices is that the public may perceive it as an elitist policy enabling more affluent customers to "buy their way up" the priority list or obtain more service regardless of what objective program priorities may be.

4. Bonding for Capital Improvements

The North Carolina General Statutes authorize the use of bonding for capital improvements to local infrastructure, including stormwater systems. A State commission vigorously oversees municipal bonding in North Carolina, ensuring that proper diligence is exercised. Bonds are not a revenue source, but simply a method of borrowing, dependent for debt service on other revenue sources. 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 be funded through annual budget appropriations, but annual revenues are sometimes insufficient 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 could be funded from annual budget resources. This is accomplished by spreading the costs over time; much like home mortgage or automobile loan enables a buyer to acquire assets they could not buy for cash. 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 cost of capital projects, land acquisition, etc.

Two types of bonding are typically available to cities and counties in North Carolina, revenue bonding and general obligation bonding. General obligation 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. All revenues, including various taxes, may be used to service a general obligation debt. Revenue bonding is supported and ensured only by revenues such as service fees. Creation of a separate source of revenue that is earmarked specifically for stormwater management (e.g., a stormwater service fee) would allow the Town to sell revenue bonds to pay for stormwater capital improvements if feasibility is determined. However, revenue bonding issued by Chapel Hill would not be backed by the full faith and credit of the Town, and would likely incur a slightly higher interest rate in the bond market.

It is also possible to issue general obligation debt that is backed by the full faith and credit of the issuer but has debt service funded from a designate revenue source like service fees. This is commonly referred to as “double-barreling” of bonds. It typically attains the same bond rating and interest rate as general obligation debt without requiring a general tax increase, although the fallback position for the bondholders is a covenant by the issuer that its full faith and credit is ultimately behind the bond.

It is not intended that bonds be used as a funding mechanism for day-to-day operations, but some costs can be viewed either as a capital or operating expense. The lack of a clear distinction between remedial repairs and new construction projects can result in bonding being used for major repairs, which might also be considered an operating expense. Given the stormwater priorities facing Chapel Hill, the most appropriate use of revenue bonding would be for capital construction and acquisition of land and easements for maintenance access to creeks and ditches. The deteriorated condition of many local creeks, ditches, storm sewers and structures suggests bonding might be justified for stopgap remedial work, even if it technically is not a capital improvement to the system.

5. In-lieu-of-Construction Fees

In-lieu-of-construction fees are not specifically authorized by the North Carolina General Statutes, but could conceivably be adopted as one element of a comprehensive stormwater service fee rate methodology. In-lieu-of-construction fees are sometime confused with impact fees. However, in-lieu-of-construction fees are usually a substitute for requiring on-site solutions even though an on-site system would work. Impact fees are generally used to pay for off-site measures to compensate for the service-demand effects of development that are not solvable on-site.

The need for in-lieu-of-construction fees stems from problems associated with requiring on-site detention systems on numerous residential subdivisions and commercial properties. Detention systems store stormwater runoff during the peak of a storm event and slowly release it afterward, and have been shown to reduce the discharge of pollutants by allowing some settling to take place. However, on-site detention requirements result in small and relatively inefficient systems on private properties, which often are not properly maintained, tend to deteriorate rather quickly, and can be easily modified or even eliminated. A proliferation of small detention facilities quickly creates an inspection and enforcement problem for local government. Fewer large systems serving many properties would be more reliable and efficient, but on-site detention involves a private developer paying for the facility while the general public usually pays for regional systems. An in-lieu-of-construction fee may offer a practical option that would be preferable to both developers and the Town of Chapel Hill if widespread use of on-site detention systems becomes an element of the long-term stormwater management plan. Developers would simply pay a fee in-lieu of building an on-site system if off-site impacts on properties immediately downstream could be avoided.

The major advantage of in-lieu-of-construction fees is that the Town of Chapel Hill (and thus the taxpayers or ratepayers) would not solely bear the capital expense for regional detention and other systems to mitigate the runoff impact created by private development projects. Developers would be required to financially participate in solutions to the impact of their projects, and the long-term regulatory problems of numerous on-site detention systems would be avoided.

The most important disadvantage of in-lieu-of-construction fees is that they rarely generate sufficient revenue to fund construction of regional detention facilities or to enlarge conveyance systems. This dictates that other revenues be used to supplement the fees in order to build regional facilities, so the taxpayers or ratepayers are burdened with the up-front cost. It is also necessary that well-refined capital improvement plans be available from which the cost of the necessary regional improvements can be determined as the basis for setting in-lieu-of-construction fees. The Town is several years away from having complete and adopted master plans.

Immediate implementation of an in-lieu-of-construction fee is not practical. Further consideration of an in-lieu-of-construction fee should be deferred until a capital improvement strategy has been adopted based on planning studies that identify opportunities for substituting regional facilities for on-site detention requirements and detail their anticipated cost.

6. Credits and Offsets against Service Fees

There is no specific legislative authority for credits and offsets as an element of a stormwater service fee rate methodology. The authority to adopt credits and offsets is generally encompassed by the basic ratemaking powers provided to locally elected officials. That authority includes the latitude to establish a variety of stormwater utility service fees and appurtenant rate modifiers such as credits and offsets to achieve what they believe is an equitable allocation of costs.

Credits are frequently included as part of a stormwater service fee rate methodology. Offsets are not. The courts have generally given great deference to locally elected officials in deciding what is appropriate for their communities. Courts in several states have also cited the existence of credits as a characteristic of service charges (as distinguished from taxes) in cases where a county or city stormwater service fee has been challenged.

Credits against stormwater service charges are designed to account for the mitigation of on-site controls and activities, and are usually predicated on a property owner's continuing compliance with an approved design and operating standards established by the stormwater management agency. Credits may also be given for activities or functions performed by individual property owners that reduce the demands borne by the public entity. Credits usually continue as long as the applicable standards are met or the activities are provided.

In comparison, offsets are one-time, dollar-for-dollar allowances for extraordinary expenses that produce a public benefit. For example, if a developer has installed a stormwater detention system that provides storage capacity in excess of that normally required (and thereby reduces the cost of upstream regional detention or downstream public stormwater conveyance systems), a one-time offset against a service fee might be granted for the additional incremental capital expense of providing excess capacity. Another, perhaps simpler way to accomplish the same objective is for the local government to buy excess detention capacity from developers by the cubic foot. Once on-site detention is required and a given amount of detention must be built for a given site, the incremental cost of each additional cubic foot of capacity is often relatively low.

Offsets should be a matter of consistent policy and not special case. They are not normally conditional or based on continuing compliance with operating standards. As stated above, however, stormwater service fee rate methodologies rarely provide for offsets.

Credits are commonly provided in stormwater service fee rate methodologies to appropriately recognize on-site measures that reduce peak stormwater runoff, total volume, and pollutant loadings. In that sense, they are like industrial pre-treatment credits for industrial wastewater dischargers. The courts also view credits as evidence that a stormwater service fee is a properly designed service fee and not a tax in disguise, making them a good policy even when their practical use is minimal.

7. System Development Charges

System development charges are also known as capital recovery charges, capital facilities fees, utility expansion charges, and by other titles. They are not specifically provided for by authorizing legislation in the North Carolina General Statutes, but are frequently be incorporated into stormwater and other utility service fee rate structures.

These capitalization charges differ from impact fees. They are usually designed to recover a fair share of the previous public investment in excess infrastructure capacity from a developer who makes use of the additional system capacity. In most cases that excess capacity has been provided in anticipation of development projects subject to the capitalization charge. This is usually a more economical and prudent long-term system development policy than attempting to increase service capacity to meet the demands of growth on a case-by-case basis as it occurs.

There are several ways of structuring and calculating capitalization charges, including the growth-related cost allocation method, the system buy-in approach, the marginal incremental cost approach, and the value of service methodology. They differ from in-lieu-of-construction fees and impact fees primarily in terms of: 1) the fundamental purpose of the charges; 2) their relationship to the point in time when improvements are made versus when the charges are collected; and 3) their relationship to specific facilities which are funded through service charges. In most cases, system development charges are related solely to capital costs, as opposed to operating expenses. However, some justification may exist in certain circumstances for incorporating long-term operating expense associated with system capacity into a capitalization charge.

System development charges basically provide a mechanism whereby developers participate in paying for excess capacity that was previously built into a public system in anticipation of their needs. In effect, a system development charge allows a deferral of participation in the capital cost of a facility until a property is developed and makes use of the provisional capacity. The use of such fees for stormwater management capital costs is clearly appropriate since most drainage systems are consciously designed to provide excess capacity to accommodate future development in an economical manner.

The need for a stormwater capitalization charge is related to basic rate methodology employed. Most stormwater service fees are based on impervious area. The obvious result is that only developed properties are charged a service fee. Undeveloped properties do have impervious area and therefore are not charged. However, capital facilities being funded by the service fee will normally be designed with future conditions in mind, including the impact of growth. This results in excess capacity being incorporated into the system and being paid for solely by currently developed properties under an impervious area methodology. A capitalization charge may therefore be adopted as a recapture mechanism to ensure a fair and reasonable allocation of the capital costs among all properties using the facilities over time. The calculation of a capitalization charge may also include a system depreciation factor so that a development built near the end of the useful life of a facility pays only for the portion of the life cycle when it is using the capacity provided.

Some communities have adopted service fee rate methodologies which bill undeveloped as well as developed properties. This is most common when extensive major capital improvements to the systems are being funded and built and it is desirable to spread the cost as widely as possible to keep rates low. If designed to properly allocate capital costs this type of rate methodology can obviate the need for a capitalization charge to recapture deferred financial participation. However, this approach also poses a potential inequity. It is based on speculation that all undeveloped properties will be developed to the design condition within the life cycle of the facilities and make use of them, which may or may not be reasonable in different settings.

8. Plan Review, Development Inspection, and Special Inspection Fees

Chapel Hill has been reviewing stormwater plans in conjunction with development approvals for several years. Although there is no specific statutory authority for special service fees for stormwater management plan review and inspections, they could reasonably be included under the scope of a stormwater service fee rate methodology since they are clearly fees for special services.

The rationale for including such fees in a rate methodology is based on the "origin of demand for service" concept, in which costs are apportioned only among those whose needs require the service. Not all "service" provided by a stormwater management program is uniform throughout a community. Some services, such as plan reviews and inspections, are provided only to a specific clientele. Instead of distributing the cost of such services among all service fee ratepayers, special service fees can be adopted which apply only to the parties who are served.

Fees of this type are often incidental to the performance of specific regulatory activities by the local jurisdiction that are intended to protect the public health, safety, and welfare. Some of the regulatory activities may be mandated by federal and/or state requirements. In other cases they are simply intended as a cost recovery mechanism that assigns the expense to a specific clientele that is served. For example, experience has demonstrated that on-site detention systems tend to deteriorate rapidly after about five years. Maintenance is sometimes deferred, or alterations may be intentionally or unintentionally made to the facilities that compromise their functionality. Annual or biannual inspections may be required to ensure that on-site systems are properly cared for and not altered from their approved design. It would seem appropriate that the cost of such inspections be assigned to the specific property owners through special inspection fees, thus relieving the general service fee ratepayers of that cost of service.

In the case of Chapel Hill, separate fees for stormwater system plan review and inspection would provide only a small additional amount of revenue, but would enhance the equity of the cost distribution by removing the costs from service charge ratepayers and isolating them to those who require these services if such costs were borne by stormwater service fee rates. Adoption of special fees to recover the costs of such functions would also require that other Town fees associated with the same reviews or inspections be evaluated to ensure that the developer is not being charged twice for the same services. This could require adjustments in other fee schedules, and accounting changes to ensure that the special fees for stormwater plan review, inspections, etc. are allocated to a stormwater enterprise or special revenue fund if one exists.

9. Impact Fees

Impact fees have been associated with a variety of public infrastructure components across the United States. They are often popular with existing residents who wish to see developers pay the entire cost of new capital facilities. Naturally, they are just as often highly unpopular with developers. Specific applications of this type of funding method have been the subject of a great deal of litigation nationally. An unusual aspect of impact fees is that state courts around the country have been notably inconsistent in their definition of them and decisions on their application.

Standards have evolved for adopting and applying such fees and been institutionalized in legislation in several states, though not yet as general legislation in North Carolina. In North Carolina the limited instances of impact fees are the subject of exclusive legislation that typically applies only to a single jurisdiction. Lacking any general legislation, the Town of Chapel Hill would most likely have to seek exclusive legislation to authorize it to use impact fees for stormwater management. Development sector interests, particularly home builders, have taken the offensive and gained adoption of impact fee laws in several states that impose so many administrative burdens and limitations on use of impact fees that they are essentially impractical as a funding source for stormwater system improvements.

Impact fees are typically limited to situations in which the impact of new development on existing infrastructure systems is: 1) measurable and certain; 2) of definable geographic or systemic extent; and 3) quantifiable in terms of the incremental capital investment that will be required to maintain (not attain) an adequate service level. The final point is critically important in terms of stormwater management systems. Impact fees cannot be used to bring an inadequate existing system up to an adequate service level, and thus are not useful in correcting the many problems that currently exist in the stormwater systems in Chapel Hill. Impact fee revenues must also be earmarked for specific projects or uses, must be expended relatively quickly, and, if not spent for the stated purpose, must be returned to the developer, often with interest.

All of this makes impact fees impractical for stormwater management in most situations and almost certainly so in Chapel Hill. The crux of the problem is that few of the local stormwater systems that have problems could be described as providing an adequate level of service at the present time. It is likely that the Town would have to bring a system up to an adequate level of service before applying an impact fee to a development or spending impact fee revenues on a project that would maintain adequacy in the face of growth.

Even though there is a good deal of new development and redevelopment taking place in Chapel Hill, most of it cannot be reliably shown to demand additional service capacity exceeding what would be provided by an adequate system (if one was in place). The Town of Chapel Hill simply does not have the engineering analyses and master plans to support such a position. An impact fee would therefore generate little revenue and place burdensome administrative demands on Chapel Hill to manage and track the use of the funds. A stormwater service fee rate structure offers better opportunities to ensure that new development participates fairly in the cost of facilities through system development charges, which differ from impact fees in several important ways (see System Development Charges, above).

10. Developer Extension/Latecomer Fees

Developer extension/latecomer fees are not specifically provided for funding extensions of stormwater systems, but might be within the authority contained in Chapter 160A of the N.C.G.S. if adopted as part of a comprehensive stormwater service fee rate structure. They are not a revenue mechanism, but rather a means of properly distributing capital investment costs among several properties when one developer builds a facility with excess capacity to accommodate adjacent or nearby properties that are to be developed subsequently. The most common use of this type of fee around the country is for water and sanitary sewer system extensions.

A developer extension/latecomer fee works in the following way. Developer "A" proposes a project that requires a stormwater (or water, or sewer) system with "x" capacity. Practical design considerations indicate that a larger system should be installed to properly serve other nearby properties that are currently undeveloped but likely to use the system when they are developed in the future. Developer "A" therefore is required to build a larger system than necessary simply to serve his or her property, and incurs an additional cost. Property owners subsequently tapping into the improved system when their development occurs are charged a one-time fee by the administering agency for connecting to it, and the fee is then transferred to Developer "A".

This type of fee is supposed to be structured so that Developer "A" and all other property owners ultimately bear a fair proportion of the additional capital cost when all properties are finally built out. The administering agency typically receives no revenue from the fee, although some do charge administrative expenses on top of the capital cost that is being distributed by this funding mechanism. This type of fee appears to be practical and feasible for Chapel Hill, but only in the future when the capital improvement needs have been fully defined for local areas and development standards are adopted requiring provision of excess service capacity as a condition of development approvals.

11. Federal and State Funding

Chapel Hill has all necessary authority to make use of Federal and State government grants and loans that might be available to help support its stormwater management program. The only action needed is for the Town Council to apply for and accept various grants and loans. However, with the exception of the funding that might possibly be available in the future from Clean Water Management Trust Funds or the State of North Carolina's revolving loan fund, there are few federal and state funding mechanisms for local stormwater management programs. Federal involvement in stormwater management (other than regulatory programs) is typically limited to advisory assistance, cooperative programs like those provided by the United States Geological Survey and the United States Army Corps of Engineers, and emergency response following devastating floods.

Conclusions

This assessment concludes that a stormwater service fee offers more flexible, stable, and equitable long-term stormwater management funding for Chapel Hill than any other option. While most cities and counties establishing stormwater service fees have done so through a "stormwater utility", it must be stressed that service fee funding does not necessarily dictate that a stormwater utility organization be established. A wastewater or water supply utility or authority in North Carolina may be able to establish stormwater service fees subject to the same limitations as a city or county. In fact the South Brunswick Water and Sewer Authority (Southport, North Carolina) has adopted stormwater service fees as part of its funding package.

Regardless of the institutional mechanism employed, only a service fee approach appears to be capable of generating sufficient revenue to meet the program needs identified in Chapel Hill. However, whether a service fee is feasible involves other considerations. This assessment concludes that a stormwater service fee will be feasible in Chapel Hill only if it: 1) results in a technically equitable allocation of costs that is understandable to the general

public; 2) ensures that the revenue is dedicated solely and specifically to stormwater management; and, 3) is packaged and presented in a way that makes sense.

It is clear that a service fee has several significant advantages over other funding options. It is highly flexible, offers the prospect of stable funding over time, allows restrictive dedication of the revenues to stormwater management only, and enables elected officials to craft an equitable distribution of costs through a service fee rate design. A service fee rate structure can allocate costs based on the demands placed on the systems instead of property value or other factors unrelated to stormwater service needs.

Needs change, and the ability for funding to change with needs is critically important. A service fee rate methodology can be periodically adjusted in concert with major transitions in programs and priorities, especially in terms of system improvements. Other funding methods can be integrated with a service fee, either as part of a rate structure or independently. Funding methods differ in their suitability for capital, operating, regulatory, and other types of costs. At this time, stormwater service fees appear to be viably only for operating and capital expenses associated with "systems". The revenue stream created by a service fee may also allow revenue bonding for major capital investments, enabling Chapel Hill to expedite major improvements to the stormwater systems without limiting its general obligation bonding capacity for other purposes.

A stormwater service fee has sufficient revenue potential to assure consistent funding at a level that would support an aggressive program. The Town's General Fund, with revenue generated by a variety of taxes and other mechanisms, has sufficient total revenue capacity. However, it must also support numerous other municipal services that do not lend themselves to utility funding (such as police and fire services and street maintenance). Stormwater service fee funding could relieve, partially or wholly, the demands stormwater management now places on the General Fund.

Under an enterprise or special revenue fund, a service fee also allows earmarking of revenues strictly for stormwater management, thus improving accountability. Money not spent in one fiscal year carries over into the following year and cannot be diverted to other uses. This encourages stewardship of the financial resources.

The major disadvantages of a service fee are that it costs money to implement and new fees might be politically unpopular. Political acceptance is more difficult to forecast. Public reaction to stormwater service fees elsewhere has ranged from very positive to very negative. Given the extent of local drainage problems and the amount of work that has been done with citizen groups, it is probable that the community would be receptive to a workable long-term solution. In fact the various stormwater advisory and technical groups have said this was an appropriate alternative and that it was time to get on with it. The program and funding strategy that offers a realistic prospect of solutions will still have to be communicated convincingly to gain public support.

If the Town Council chooses to establish a stormwater service fee it will have to address both institutional and funding issues. One or more ordinances will have to be drafted and adopted. The experiences of other cities and counties suggest that an intensive public information effort should be conducted to explain a stormwater service fee concept to the community.

Town of Chapel Hill

Pro Forma Business Plan –
Utility-Based Stormwater Management Program
I-3 Basic Database Feasibility

Introduction

At the most basic level, the rate structure for a stormwater utility can be built upon assigning rates based on contribution of stormwater runoff for a given property. Stormwater runoff can be related directly to the amount of impervious area that is built upon a property. This is a brief assessment of the data needed to support the creation of a user-fee-based stormwater management program for the Town of Chapel Hill.

In assessing GIS data for a potential stormwater utility, there are four key data components that are used to develop a stormwater utility billing database: tax parcels, the attributes describing these parcels, planimetric data, and aerial orthophotography. These form the basis for developing a stormwater management service charge rate methodology that can be applied to individual properties. The rate methodology is then applied to individual properties and bills are generated and delivered to each customer.

A key step in setting up a utility is development of a Master Account File. The Master Account file will include information on the customer, the property type, the amount of impervious area, and the rate to be billed. This account file is then integrated into the utility billing system to generate actual bills. Existing databases, such as property tax rolls and water/wastewater account files, are typically used as the foundation for building the Master Account File. Customer data contained in the Master Account File will depend on the source data used to create the file. For example, if tax rolls are used in developing the Master Account File, then the file will likely be based on parcel ownership rather than on water or wastewater customer.

Basic Database Feasibility

For stormwater service charges to be implemented, a means of billing, collecting, and accounting for the service charge revenues must be identified and instituted. Experience has been that the requirements of a stormwater management service charge billing often challenge the capacity of existing systems and can pose a potential major obstacle to timely implementation. In order to implement and properly bill, collect, and account for stormwater service charges, two main systems are required. These are:

1. **A system to generate and manage a list of charges and related data for each stormwater customer.**

Assuming the basis for charges is impervious area, this method will require that parcel lines and impervious features be established for some ratepayers. Parcel-based charges can be developed using this method. Typically, single family residences (SFR) are billed one or a series of flat rates, such that actual computed impervious areas are only required for non-residential customers. We estimate that there will be fewer than 3,000 non-residential

customers (NSFR) in Chapel Hill. From the data we've evaluated to date, our experience tells us the tax-billing database will need to be expanded to include classification fields to support the additional data needs.

2. A method to deliver bills to customers and account for payments, credits, etc.

The easiest way to satisfy this requirement is to add stormwater service charges (as a separate item) to an existing service billing system, such as a water and sewer billing system. Since the relationship between Chapel Hill and Orange Water & Sewer Authority (OWASA) is supportive and since water and sewer bills for Chapel Hill are already initiated at OWASA, the most effective and efficient way to provide stormwater user fee billing will likely be through OWASA. In this scenario, parcel-based charges must be converted to account-based bills before billing can be accomplished. Another method that might be used is to add stormwater service charges to the annual tax bill. This however will blur the line in perception between this being a user fee and being a tax.

Existing Data

The Town of Chapel Hill has access to or possesses several systems and data sets that can be used in implementing stormwater service charges. The latest aerial photographs were taken of the Town in 1998. The photographs are black & white orthophotography developed with a resolution of 0.5' pixels. The photography that was reviewed appears to be somewhat grainy, but the high resolution allows for an adequate source for generating the impervious features coverage.

However, to ensure that the billing file is as accurate as possible and to establish the Master Account File from the same source data, it is recommended that the Town be re-photographed in late fall 2002 or early winter 2003 when the trees have lost their leaves. It will then be possible to manually digitize impervious surfaces in a drafting or GIS program. It will not be possible to use the power of a GIS software package to perform the calculations by parcel until the planimetric and cadastral mapping is completed.

GIS Planimetric Layers - The Town has limited GIS data relating to impervious features, as this is information that has not been previously needed for Town purposes. There is a background coverage containing building footprints. It appears that some of these features appear sporadically and are often not as spatially accurate as the utility would demand Figures 1 and 2 on the next page show some of the difficulty that will be encountered if the Town chooses to use only existing data.

FIGURE 1 -*Limited available building footprints.*

FIGURE 2 - Many building footprints are not 100% accurate

Evaluation Criteria

Imperviousness is the single greatest factor in estimating runoff volumes from individual land parcels. Although the final decision on a rate structure might require that other factors be considered in determining stormwater charges for each land parcel, for this analysis itis assumed that impervious area will be the major factor in computing rates. Given this assumption, parcel lines and impervious features are required inputs into database development. Given the available data and systems, a stepwise process and set of evaluation criteria for implementing stormwater service charges is provided below. If Orange County and/or Carrboro decide to join the Town of Chapel Hill in improving the stormwater management program in the near future or at a delayed date, the following process can be modified to accommodate the change. **Based on existing data tools, the process for development of the Master Account File is:**

1. Acquire a digital copy of the Orange County tax database and GIS parcels coverage (coverage is a data model form shown within ARC/Info), identify parcels inside the Town limits of Chapel Hill, and identify which of these parcels are single-family residential. Set aside the single-family residential parcels to be billed by flat rate (if applicable). Set aside the non-single family parcel list for other uses. This data set must have accurate identifiers, such as parcel numbers, physical parcel addresses, and owner names. Using the non-single-family parcel list, find each of these parcels in the GIS parcels coverage. The GIS parcels coverage must have current parcels, accurate parcel numbers, and be on a coordinate grid system that is positionally accurate to within 10-15 feet.

   The physical parcel addresses from the tax database will need to be verified if addresses are used. The residential addresses tend to be less accurate than the commercial addresses. Public Utilities' site address data should be a valuable resource in verifying and updating the tax data. Even then, it will be necessary to field check some streets. Finally, there will be the need to digitally overlay these non-single family parcels on the new ortho-rectified photographs, move the parcel lines as necessary to align them with visible cues from the photographs, digitize the visible impervious features on the photographs which fall under each non-single family parcel, and compute the impervious area of each of the non-single family parcels.

2. Create a GIS coverage (polygon-based) of impervious features based on the 1998 photography for NSFR parcels only. This coverage should include building footprints, parking lots, sidewalks, patios, miscellaneous concrete/hardened surfaces, etc. This initial impervious features coverage will represent the state of imperviousness through 1998.

3. Update the initial impervious features coverage using the ongoing work performed by Deborah Squires that utilizes building plans/permits. In addition, develop methods to incorporate other impervious features not captured by Deborah Squires. Additional actions might require field visits and GPS data collection on NSFR parcels containing new impervious features. Establish the "cut-off" date for the impervious features coverage.

4. Make a decision about how roads will be addressed in the utility. This decision will affect how roads will be dealt with when creating the impervious features coverage.

5. Create a separate impervious coverage (or an additional component of the main impervious features coverage) for SFR sample parcels.

6. Intersect NSFR parcels and impervious features to determine amount of impervious area (IA) per NSFR parcel. Develop strategies for managing complex many:1 tenant-to-parcel issues.

7. Establish the initial billing file.

8. Match each parcel in this initial billing file to the parcels, accounts and addresses found in the water and sewer billing system, creating "stormwater only" accounts where necessary.

9. Adjust the water and sewer billing system to handle the additional line item charge and associated accounting needs. The water and sewer billing system must be designed such that an additional service charge line item can be added.

10. Establish data management and maintenance procedures to allow for accurate accounting, collection, and continuous updating of stormwater data. These processes can be GIS-based or manual.

Approach for Data Management and Development

Other existing data that needs to be closely examined includes:

1. The existing water and sewer billing system (OWASA), which may already have parcel numbers associated with the account number. Past experience has shown us that this is not always the case, as the billing system is account-based and not parcel-based.

2. The existing tax billing system. Orange County does all billing under contract to Chapel Hill, collects the taxes and forwards monies to the Town daily. The initial tax billing is in July, and the tax digest is set final in October of each year.

The impervious features information currently available to the City is limited. Much of the effort and cost of building the stormwater utility will go to building and refining this data component. Once complete and current, strategies will have to be developed and implemented to maintain the accuracy and completeness of this critical GIS layer.

The most important and the most difficult part of the process requires high-quality, current original data. The Town's current photography is almost five years old. This is of particularly concern considering the growth and change in the area in recent years.

The decision about how to proceed is a balance between accuracy versus time and expense. Re-flying the area (a flight of approximately 20 square miles of digital imagery) could not be done effectively until late winter when all the trees are bare. We would suggest that the entire Town be flown at 1:1200 scale in order to get very high resolution photography. (Other sources of photography may be possible to find and should be considered as a first step). It is recommended that the Town team with Orange County and other incorporated jurisdictions for new photography. The flight to obtain the photography would probably cost between $20-30,000. The greater costs involve processing the imagery and the ortho-rectification (processing image to match real-world terrain, etc.) process. The total cost of re-flying and processing the data is estimated at $150,000. Digitizing the impervious coverage will cost an additional $120,000 and $175,000, to capture all features within the Town limits including residential units and public roads.

Before the aerial photography is undertaken, it is highly recommended that building the utility database be considered in determining the kind and form of data to be captured. Coordination with the consultant will considerably enhance the usability of the data. AMEC would work with the Town to determine the best alternatives for planning the mapping portion of the project, and as part of an agreement could be made responsible to oversee the work and the timeliness of the mapping company. This is the most efficient methodology for completing the work. The cost can be folded into the utility start-up costs.

Once the flight is complete, it takes approximately six months before data is available from the mapping company for use in building the Master Account File. This may impact the start-up date for the utility.

On the plus side, once new data is available, the Town would have more accurate information to start the utility and can then be more confident in initial billing accuracy and the ability to keep up with changes and additions.

Possible Problems and Data Gaps

It may be difficult to match existing water and sewer account numbers with parcel numbers for some accounts. Once digital methods are exhausted, hand matching using addresses and names can be used to finish the task.

The tools used in the computation of impervious area for non-single family parcels are imperfect, due to parcel line and photograph inaccuracies. This is addressed by use of a standard billing unit, usually 1,000 square feet or greater.

For seamless operations in the future, a linkage will be required between the OWASA system and a system for computing impervious areas for non-single family residential parcels. The details of this linkage cannot be known at this time.

Schedule

In order to perform the process detailed above, and to allow for some extra effort to overcome the possible problems and data gaps mentioned, a time period of eight to nine months should be allowed, *once all source data has been assembled*. To match the 20-24 month schedule for developing the utility, the Town must re-fly the area by February 2003; impervious coverage data would then be available in approximately October 2003. It frequently takes two months to acquire all digital source data in a useable format. If the Town plans to utilize a GIS for data management, appropriate coordination with Orange County should be undertaken immediately. This coordination will add some time to the schedule but likely result in a more integrated system.

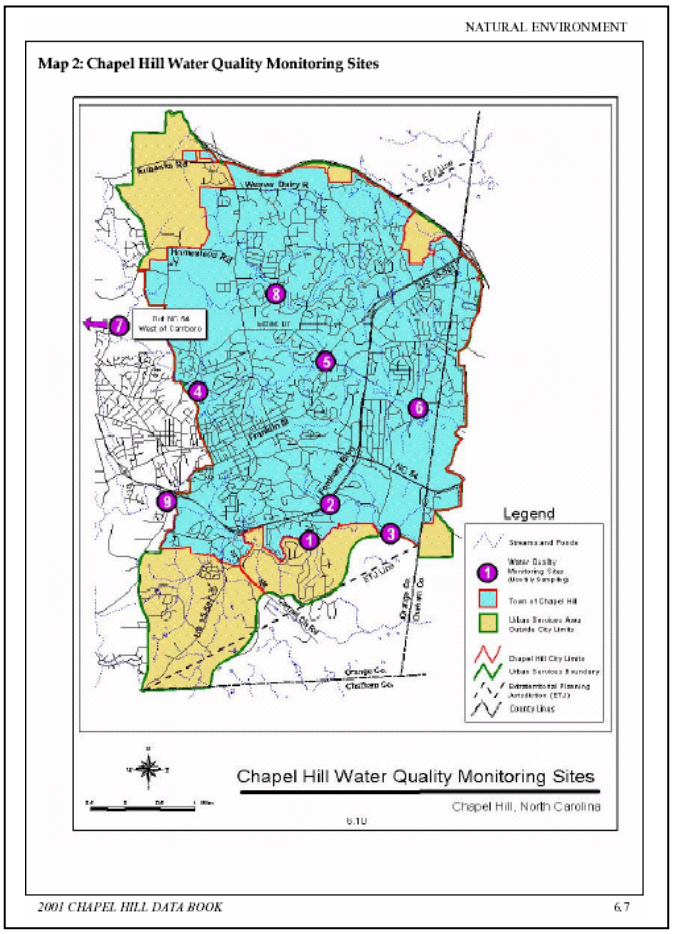
Given all timing and schedule issues, 20 to 24 months should be allowed from notice to proceed on the Master Account File portion until an integrated system is completed. This would integrate with the Town's wish to have the utility in place in 2004, but might push the January 31, 2004 date back to second quarter 2004.

Town of Chapel Hill

Pro Forma Business Plan –
Utility-Based Stormwater Management Program

I-4 – Recommended Approach

Stormwater programs are comparable in many ways to more traditional municipal water supply and wastewater treatment utilities. Nearly all involve management of a complex system of natural and man-made physical structures, and demand continuing operational and regulatory programs as well as capital investment in the systems. Most provide a comprehensive program that addresses water quality as well as quantity (flood) control. However, no standard definition is adequate and no "cookbook" approach to funding stormwater programs exists.



Chapel Hill faces a "program development curve" in the next few years as administrative, operational, capital investment, and regulatory elements of stormwater management are formulated and carried out. It will take five to ten years before a comprehensive program is fully attained. Funding should be expected to evolve along with the program. Full implementation of the funding program associated with a comprehensive stormwater management program may therefore require ten years or more.

Based on our findings and validating the work of several Committees appointed by the Town of Chapel Hill over the past 10 years, it appears that a stormwater service fee is the most viable long-term funding method for the proposed program. A stormwater service fee offers stable and adequate revenue to meet the system service requirements and the opportunity to design a rate methodology that results in an equitable distribution of the cost of services and facilities.

Service fee rate structures typically are designed to distribute costs based on the demands placed on the stormwater systems and programs. There are several ways of augmenting a standard stormwater service fee that offer opportunities to enhance both equity and revenue sufficiency under the enterprise fund approach. Some are consistent with the "service demand" philosophy that prevails for fees, while others are more in tune with "direct and

special benefit" concepts associated with assessments or with the "tax" philosophy that is strictly related to revenue generation without concern for service demand or benefit.

Influence of Policy Recommendations on Implementation

A series of policy issues needs to be addressed if the Town of Chapel Hill decides to establish a stormwater management enterprise fund. The issues should be carefully documented since they directly impact the validity of Town Council actions related to the establishment of the enterprise fund and adoption of rates and other funding methods that might be associated with it. The following recommendations on specific funding issues are based on the experiences of other cities that have implemented stormwater management enterprise funds. They are the minimum that should be examined and documented. These issues will dictate to some degree how the implementation process will proceed if the enterprise fund approach is selected by Chapel Hill.

1) The Town should establish a stormwater management fund as a separate cost center encompassing the full range of services and facilities associated with stormwater quantity and quality management, ranging from flood control to water quality management. This cost center should be accounted for as either an enterprise or special revenue fund apart from the General Fund.

2) A stormwater management program should be funded primarily from service fees. The stormwater service fee should be on the same bill as the water and wastewater charges if possible, with the assistance of the Orange County Water and Sewer Authority (OWASA), and should appear as a separate line item.

3) The rate methodology for stormwater service fees should be fair and reasonable and result in charges that bear a substantial relationship to the cost of services and facilities.

4) Bonds should be used to pay for major capital improvements to the stormwater systems, but should be limited to projects and acquisitions that are beyond the capacity of the service fee to fund through its annual revenue stream.

5) Service fee credits should be provided for properties that have on-site stormwater management facilities, where practices are conducted that mitigate peak flow, total volume, and pollutant loading impacts on the public drainage systems, or where distinctly lower levels of service are to be provided as a matter of policy.

6) The Town should seek and accept state and federal funding in support of the stormwater management program only in instances where such funding is consistent with local objectives and practices and offers appropriate latitude to the Town in using such funds and its own resources.

7) The Town should determine if a service fee rate increase is desired after the initial start-up of the expanded program or if a higher initial rate should be adopted that would cover a longer period.

A stormwater management enterprise fund can be established even before the Town is ready to bill and collect stormwater service fees. By establishing a stormwater management program as an independent enterprise fund, before the extensive work of developing a master

account file and building the service fee calculation database, those and other costs can be shifted ultimately to the "ratepayers", who in some cases will be different than the City's "taxpayers". Initial funding could be provided by an interfund loan to a stormwater management enterprise or special revenue fund from the General Fund or reserves in other funds, with repayment to be made from future stormwater service fee revenues. Several other cities have used this approach to meet the front-end expense of developing a master account file and other related systems.

The other stormwater management costs that might be funded initially through interfund loans could also include the acquisition of key pieces of operational equipment. This would "jump-start" the operating and capital improvement programs so they could be on-line by the time that service fee billings begin. Expediting correction of some of the more highly visible drainage problems around the Town in this way will demonstrate the value of the program to ratepayers even as the first billings are being sent out.

Expeditious and Efficient Implementation

The transition to a stormwater program funded primarily through service fees typically involves highly visible changes in the operating and capital investment programs and budgets. The experiences of other jurisdictions indicate that the implementation of a stormwater program service fee can be a costly and time-consuming process unless care is exercised in the approach selected. Key policy decisions made in formulating the funding and program concept dictate what must be done to implement the service fee funding mechanism, thus driving the expense and time required for implementation.

Because of the large revenue amount involved, time is potentially more costly than the added cost of expediting the work that must be done to implement a stormwater service fee. Until the potential revenue stream is actually realized there is an opportunity cost of lost revenue each day that service fees are not being billed. This tends to create an atmosphere of urgency once the decision to establish a funding program is reached. In some cases the daily cost of unrealized revenue has driven municipalities to employ fast, but very expensive, implementation options or to accept a lower level of quality and accuracy that portends higher future costs to resolve problems. Recognizing this, it is possible to take measures to spend the appropriate amount of time to ensure the utility goes on-line correctly and with a high level of quality.

Implementation Plan

It is imperative that the correct steps be taken if a utility is established. Shown below are some of the critical tasks and actions which, when timed correctly, will result in the formation of a comprehensive stormwater management program. <u>This report does not contain sufficient details and staff input to form the enterprise fund without additional, detailed analyses.</u> However, it does provide sufficient information to determine the merit in pursuing this approach to funding the stormwater management program.

The key steps in the process are:

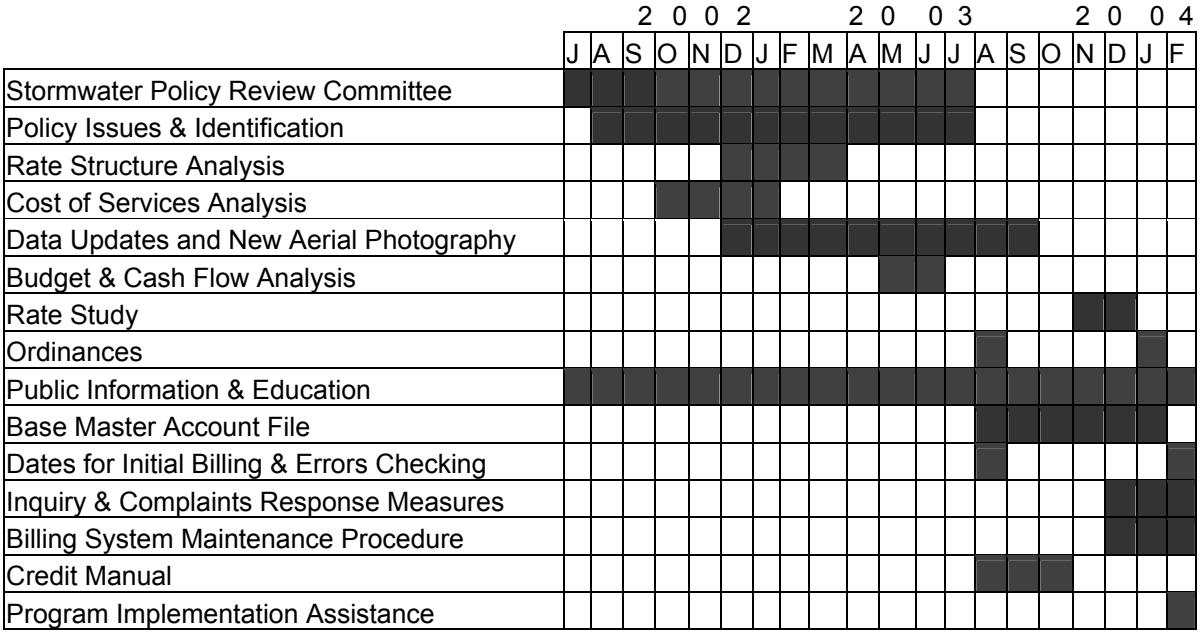
1. Form a Stormwater Policy Review Committee to review the program and to provide feedback on program and policy issues

2. At the same time, develop a Program Strategy, make policy decisions, with the Stormwater Policy Review Committee input
3. Develop data for establishment of a rate structure, including new aerial photography
4. Perform a Cost of Services Analysis
5. Establish Enterprise Fund and separate Cost Code Centers
6. Perform a Preliminary Rate Study
7. Implement Customer Service Programs, Public Information Program
8. Create the Comprehensive Stormwater Management Program (passage of program service ordinance)
9. Create Master Account File
10. Determine Credit Program
11. Revise Rate Study to match Account File and Credit Programs
12. Continue Implementation of Public Information Program
13. Create Billing Process
14. Create Rate-based Program (passage of rate ordinance)

We recommend a two-phase approach be taken. Phase I includes steps #1 through 7 above – the development of the program and the enterprise fund (program service ordinance). After being legally established, Phase II (Steps 8 through 13) includes undertaking the associated rate study (rate ordinance) and master account file development (billing system).

This approach offers several advantages. First, it allows several opportunities for the general public to provide input as the Town Council considers the new stormwater management program changes. Secondly, it separates the revenue generation consideration from the program/service development consideration.

Based on our experience, the Town is approximately 20-24 months away from implementing a user-fee based, comprehensive stormwater management program that would result in a bill being issued. The process can be shortened, but it will increase the risk that the establishment of the enterprise fund may not be on firm legal ground– increasing the overall problems, rather than helping to solve them. The above steps are translated into 15 tasks associated with formation of a stormwater enterprise fund user-fee. Shown below are the tasks, and a potential schedule.



Based on the above layout of tasks, it will take at least 20 months to complete the necessary actions to form a stormwater enterprise fund and send a bill. If started in Fall 2002, we would anticipate that the program could be established and a bill could be sent in accordance with the Town's anticipated schedule of January 31, 2004. Depending on the implementation of the re-mapping strategy, it may be more realistic to anticipate a second quarter 2004 billing date.

Town of Chapel Hill

Pro Forma Business Plan –
Utility-Based Stormwater Management Program
I-5 Public Involvement Plan

Introduction

The Town of Chapel Hill has had three separate Advisory Committees over the course of the past 10 years to review and develop recommendations regarding stormwater management. In each case, public information and education was recommended. For example, the *Recommendations of the Stormwater Utility Development and Implementation Study Committee* November 26, 2001 urges the Town "to undertake a comprehensive and coordinated public education program to consistently inform citizens of stormwater, water quality and floodplain management issues, to enable them to take mitigation actions and to provide a simple mechanism to alert officials of observed problems". Based on a public charette, previous committee recommendations and review of the Comprehensive Plan and other relevant policy documents, the same committee listed "effectively educating and incorporating citizens, businesses and institutions in stormwater management issues and programs" as a goal for comprehensive stormwater management.

Regulations impacting water quality require the Town to address public education and involvement in their programs, recognizing the importance of empowering the public to participate in protecting waters of the State.

Public awareness and education are carried out in stormwater management programs in two ways: specific public education campaigns and ongoing "baseline" public information programs and activities. These differ in that a campaign has a beginning and an end while the ongoing program goes through transformations but does not envision an ending.

In order to develop a plan for the public information and education (PI&E) program we must first identify: (1) the phases of the project, (2) the "public", (3) the message(s), and (4) the different possible ways to communicate the message to the public (the media).

Phases of the Project

The development of a user-fee for stormwater is expected, in terms of public information, to have three phases: buildup, billing day, and the post-billing period.

The buildup is the period of developing and implementing the stormwater management program and funding program. The buildup starts immediately and progresses to within a few weeks of the first bill going out. This period is one of gathering and disseminating data and information, identifying and meeting with different key public sectors, educating the press, and forming policy.

Billing day starts about three weeks out before the first bill goes out and lasts through the first month of billing. It focuses on broad coverage of the reasons for the billing, examples of the effectiveness of the stormwater program and customer service responses to those with inquiries and complaints.

The post billing period begins after the first month of billing and then blends into the long term PI&E program about the stormwater program.

The Messages

What is it that makes a stormwater enterprise fund and user fee desirable in the first place? It provides a stable and adequate source of revenue to allow the Town to fix and avoid flooding (and other stormwater) problems and it does so in a way that is fairer than property tax based methods.

The best way to "sell" a stormwater user fee is to stress the goals of the expanded stormwater program...and to demonstrate those service changes in the first few weeks of the program's life. Care should be taken not to try to sell the program "because EPA is making us do it", "to get more money", or "because the general fund will get a windfall", etc. It is also important not to raise expectations above what can be delivered. More money is NOT the solution if the program itself is not more effective. And, if there will be no property tax rebate; the Town needs to have a good explanation why in case the question is asked.

So, in summary the messages should stress:

- there are needs in the community that are currently not being met;
- we have a plan to meet these needs that is well thought out, effective and not extravagant;
- government must take the lead in this;
- this plan costs some more money, but this additional investment is well worth it in terms of benefits;
- the method to generate this new revenue is fair, adequate and stable, and is fairer than a tax increase;
- the method is not a tax but a user fee and is very practical in its approach;
- the cost to each homeowner is minimal; and
- you will see results.

Specific program-related messages concerning stormwater credits, a potential cost savings for detention with new master plans and models, a more effective maintenance program, etc. can also be effective.

Message Goals

In terms of the phases of the project the messages should reflect what is happening or about to happen as:

- **Buildup** - The goal of the message during this phase of the project is to educate and build support among the various stakeholder groups. Therefore the message highlights, dramatically if possible, the current problems experienced by Town residents; 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 rates and credits. Part of the goal also is to educate ratepayers about the bill they will get in order to minimize the multitude of questions and concerns. It may give special attention to specific ratepayers to avoid pressures on the Council Members from special interest groups or powerful individuals.

- **Billing Day** - The message goal here is to educate ratepayers about the bill they just received. The message must be communicated rapidly, often one-on-one, and consistently. There must be a phone line for the public staffed by people who can answer basic questions. There also must be technical personnel who can handle questions about credits and the bill amount. Another goal at this time, to help blunt any criticism, is to demonstrate that the program is active and effective. One way to accomplish this is by having construction begin on projects the day of first billing... and in advertising that fact.

- **Post Billing Period -** The post billing period goal is to initiate a longer term public education and response program. Some policies will be made "on the fly" as a more effective capital program begins and people become more aware of the stormwater services. There should be consistent information on policies, a customer service attitude to the responses, and satisfying answers to most questions. At this point a consistent way of making policies is as important as the policies themselves.

Menu of Activities

Examples of some of the more common public awareness tactics are described below. During development of the Public Involvement and Education plan those items selected by the Town will be refined.

- **Identity Creation** - This involves the actions necessary to differentiate the stormwater service from other services. The actual actions taken in this regard depend on the Town's decisions on how far they want to take this differentiation. It may involve letterhead, vehicle decals and uniforms, department status, etc.

- **Informational Brochure(s)** - These brochures are designed to give a simple explanation of the program, why it is necessary, and what it 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 (one general one, one to answer questions on billing, one on how to get a complaint fixed, maintenance policies and responsibilities, etc.)

- **Fact Sheet** - This can be a more technical but still abbreviated way to communicate information on specific topics (e.g. how to calculate your bill, what brought about the fee, what will the money be spent on, etc.). They are useful as leave behind information for certain groups (e.g. how will credits be calculated, impact on landlords, etc.).

- **White Papers** - A White paper is an in-depth discussion of topics of interest to the newspapers. They are designed to provide information that gives all necessary background for an article (or series of articles) that a paper may write. It can then serve as a reference document for the newspaper to check facts and get additional filler information to back up, for example, reporting on a public meeting.

- **News Articles** - This may be part of the white paper or another press packet. Some news organizations allow, and even appreciate, the Town providing newsy pieces about the program. They are not normally accounts of events but rather interesting stories about flooding, the funding method, etc.

- **Informational Meetings** - These meetings are designed to convey the information found in one or more fact sheets to a select or targeted group. The informational meeting is not as formal as a presentation, and allows for more give and take. This type of meeting can be effective if the speaker can give convincing reasons for the program and demonstrate that the audience concerns have been fully considered. They can be less than effective if the speaker cannot give good answers to questions and cannot demonstrate understanding of and empathy for the audience concerns.

- **Testimonials** - Testimonials work well in conjunction with presentations and within news articles and white papers. 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. The “articulate housewife” is the secret weapon when standing before a recalcitrant developer group, commission or other homeowner group.

- **Individual Meetings** - There are some individuals often called opinion leaders who, when convinced, have significant authority and influence over others. And when unconvinced they can hinder progress. In individual meetings it is important to demonstrate a recognition of opinion leaders’ positions and influence, listen very carefully to their concerns, if possible solicit their support, and respond quickly to questions that cannot be answered on the spot.

- **Video** - Many cities, namely Greensboro and Charlotte in North Carolina, have produced some excellent videos that run for about 5-10 minutes. They have used them as public information spots on local access cable channels, and for showing at public gatherings and civic association meetings. The first video talks about the need for the program, how the program can be solved, what is constraining the Town from making progress, how the program is the solution. The second video would focus on the creation of the enterprise fund, how the rate was determined, and answer some of the more common questions regarding the user fee.

- **Bill Stuffer** - The first bill stuffer is to communicate the overall change in the stormwater management, what programs are being initiated, and the priority of the effort. It will tell people that a bill will be sent in the future to pay for the program, and will provide 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 next month's bill will include the stormwater management user fee.

- **Customer Service** - The mailing of a stormwater bill will generate a lot of complaints and inquiries to the sender of the bill and to the Town. 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 a few months of billing). But many of the calls will need to be handled by Town personnel either due to the complexity of the call or the importance of the caller.

- **Project Booklets** - A list of planned capital improvements along with a projected schedule for construction has proven to be very successful. Such a booklet would also be helpful for Chapel Hill given the focus of the program on the construction of numerous smaller capital and remedial maintenance projects. But the booklet should be matched with a planned and prepared set of capital improvements which would be previously contracted and ready to construct the day the first bills go out. These projects should become media events so that media's coverage of the program is about progress in fixing long-standing problems and not about a new "rain tax".

Involvement

Chapel Hill has already used stakeholder groups, sometimes referred to as the Stormwater Advisory Committee and the Technical Advisory Committee, very effectively to develop an "appetite" for improvements in stormwater programs. Advisory groups can also be used in the next phase of the project to help in communicating the message(s) about importance of various program issues. We recommend instituting a Stormwater Policy Review Committee (see also I-4 Recommended Approach). Their meetings will generate additional public and media interest in the comprehensive stormwater management program. Information and handouts will be presented to the stakeholders and made available to the media. The press might interview individual stakeholders; special efforts to prepare them have helped keep the message consistent. We anticipate that the stakeholder group will have representatives from the general public, residents, business and industry leaders, environmental awareness groups, and other community special interest groups, in addition to the Town staff and political leadership.

As policy decisions are made, the Stormwater Policy Review Committee will need to be informed and involved with the associated implementation programs. As residents of the Town, their ability to be informed and knowledgeable will enhance their neighbor's respect for the Town. Town Staff should offer strong coordination with the group so they are knowledgeable about the implications of the policies, data collection and developments in the program.

The elected political leadership constitutes a specific group of stakeholders – perhaps the most important group in terms of approval of the comprehensive stormwater management program. The Council Members must be treated with special attention during the development of the program and its policies.

Plans should be made to educate the general public and to create opportunities for them to get involved in the stormwater management program. They represent a diverse group, which will require several methods to reach. There is an old and true adage in the public awareness business: “bring me in early I’m your partner; bring me in late, I’m your judge.” It often takes longer on the front end to do this, but it helps ensure success in the end.

The news media can be a great ally in Chapel Hill. When the media are educated and informed early, they are generally supportive of stormwater agencies and the utilization of user fees. The news media should be notified of important meetings and granted interviews when requested. White papers and other information are also helpful to insure they understand the concept and can portray it properly.

Other Public Information Needs

Whether or not Chapel Hill determines it will proceed with a utility implementation, the Town will be required to provide some baseline public information and education as well as public involvement and participation as part of the NPDES Phase II water quality regulations. The requirement for a standing long-term public involvement approach to water quantity and quality issues will continue for the foreseeable future. This could best be accomplished through an interjurisdictional stormwater work group which- could develop a program to share costs and at the same time reach a larger audience.

Implementation

It must be remembered that the public information program is to support and follow the stormwater management program, not lead and shape it. The program drives the public information campaign not vice versa. There is often a tendency for the Public Information and Education program to take on a life of its own, losing sight of the ‘real world’ objectives of the stormwater management program.

Once a decision has been reached on whether to proceed with the utility, a detailed public information plan needs to be developed. Elements in that plan would include: definition of public interest groups, identification of specific stakeholders, matching the correct communication medium with the groups, planned schedule of public information events and activities, and specific activities to be undertaken.

Current efforts like stenciling drains and providing information on the Town website should be considered for appropriateness and as elements of the program. A minimal public information program to introduce the stormwater utility will cost between $50,000-$75,000 (development of some combination of appropriate brochure, video, slide presentation and/or flyers or envelop stuffers). In addition, a baseline public information program will be needed for the foreseeable future to meet regulatory guidelines for NPDES and other water resources issues. Spending for this purpose is estimated at $.50 to $1.50 per year per capita, which would put the Town’s spending at $25,000 to $75,000 per year.

Town of Chapel Hill

Pro Forma Business Plan –
Utility-Based Stormwater Management Program
I-6 Projected Schedule and Costs

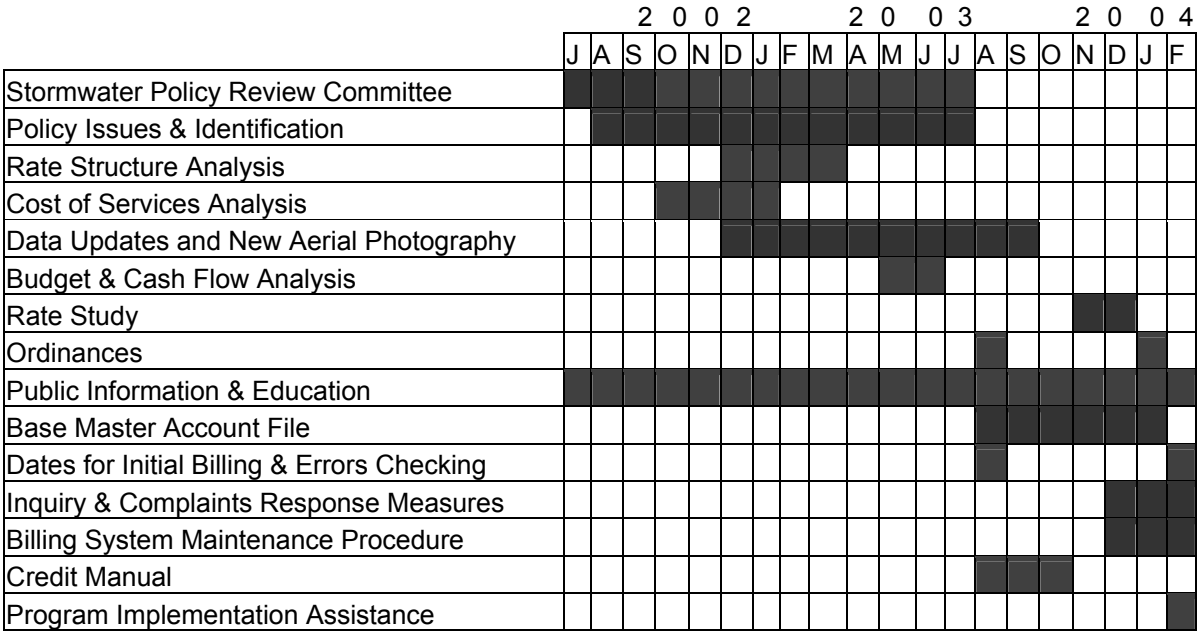
Introduction

Developing a comprehensive stormwater management program requires an in-depth analysis of the Town of Chapel Hill's organization, structure, infrastructure, programs and staffing. It also requires a considerable public information and education effort to ensure that citizens will understand and support the program. Finally, it requires specialized expertise in data gathering and manipulation and in understanding the legal and financial aspects of developing the funding mechanism for the program. For these reasons, many municipalities choose to partner with a consultant who has the expertise to support the municipality's implementation of a utility.

Projected Schedule

The Town of Chapel Hill can expect to spend 20 to 24 months developing a utility and in organizing the funding, structure and priorities of a comprehensive stormwater management program. The following is an overview look at the approximate timing of these efforts:

Table 1. Projected Schedule – Stormwater Utility Implementation



Given the complexities of the project and without the benefit of initial decisions that could clarify some of the pricing for this project, Table 2 shows an estimated investment cost on the part of Chapel Hill to hire AMEC to support the Town in the development of its utility.

Table 2. Proposed Investment Cost – Stormwater Utility Development And Implementation

Task	Task Budget
Administration and Management	$ 10,000
Policy Issues	20,000
Stormwater Advisory Committee	5,000
Program Issues and Priorities	15,000
Organization and Staffing	5,000
Public Involvement Program	50,000
Financial Analysis and Rate Determination	25,000
Data Update, Analysis, Master Account File	
-new photography	150,000
-digitize impervious areas, refine data conflicts, rate analysis	140,000
-master account file	40,000
Credit Mechanism	15,000
Program Implementation Assistance	15,000
Total Budget	$490,000

Stormwater Policy Review Committee Summary

Introduction:

The Stormwater Utility Implementation project began in January 2003 and included the establishment of a Stormwater Policy Review Committee (SWPRC) to provide key stakeholder guidance and input on specific policies associated with the implementation and operation of the stormwater utility. The intent of the SWPRC formation was to build on the efforts of the previous stakeholder groups to provide advice on the needs of the stormwater program in the Town of Chapel Hill. The previous group recommended implementing a stormwater utility as the most equitable system for funding Chapel Hill's stormwater management challenges. The Committee held its final meeting February 10, 2004. A summary of the process and the work follows.

The SWPRC has focused on structuring, implementing, and operating a stormwater management program. More specifically, the goal of the SWPRC was to provide comments and policy recommendations that assist with the development of the program and its associated funding structure. The SWPRC input provides stakeholder guidance to the Town Council and Town management team. The SWPRC recommendations are complimented by Town staff input, the consultant team's technical advice, and other considerations, to provide the Town Council with information needed to make effective decisions regarding the stormwater program and utility implementation.

Stormwater Policy Review Committee:

The Town Council appointed the 17 members of the Chapel Hill Stormwater Policy Review Committee in April 2003. These members represent a cross-section of the community including local businesses, non-profit organizations, tax-exempt groups, developers, the university, and other interested citizens.

The following is a list of the SWPRC committee members:

Phil Berke	John French	Sharon Myers
Donald Brewer	Milton Heath	Scott Radway
David Brower	Ed Holland	Alan Rimer
Mia Day Burroughs	Meg Holton	Phil Post
Mark Cate	Barbara Levine	Judith Weseman
Jeff Cobb	Julie McClintock	

It was the Committee's charge to discuss the draft policies, reach consensus on these important issues, and provide thoughtful input and recommendations. These recommendations are being forwarded to the Town Council in this Summary Report.

The SWPRC Process:

The committee held monthly meetings from April 2003 through February 2004, except for May and December 2003. Over those 9 months, the Committee discussed the following specific topics:

- Mission and Roles for Chapel Hill Stormwater Management Programs
- Stormwater Program Priorities
- Stormwater Management Program Development
- Level and Extent of Services
- Rate Methodology
- Funding Options
- Rate Base Issues – Rate Structure
- Credits and Exemptions
- Rate Recommendation

Draft discussion papers were prepared by the consultant and reviewed by staff on each topic. These documents were presented to the Committee for review, input and recommendations. Focus issues and questions were posed to the committee members during the meetings. AMEC (the Town's utility consultant) and Town staff provided information on financial, operational, and environmental consequences of various actions; on how the stormwater program currently operates; on what other communities are doing; and on alternative ways to approach stormwater management. This approach was employed to elicit SWPRC perspectives on various options and to help reach consensus on policy recommendations.

Summary of SWPRC Recommendations:

Based on the review of discussion papers, input from staff and AMEC, and discussion at the SWPRC meetings, the following is a summary of the SWPRC recommendations for the stormwater program and utility implementation:

- During the initial meetings the Committee came to the following general consensus:

  - The stormwater management program has been underfunded for several years and is in need of a dedicated, stable source of financing.
  - The utility must be able to demonstrate that it is a good investment.
  - The Town should continue to fund some stormwater activities from the General Fund.
  - The funds generated from the utility should be considered incremental to those generated from property taxes.
  - Reducing the funds currently dedicated to the utility while imposing a new fee would be considered a de facto tax increase by the public.
  - In the future the stormwater management program and the utility should be a source of pride to the citizens of Chapel Hill.

From the Committee discussions it became evident to all the participants that the stormwater management program needs to move from a reactive program that can only

respond to mandates and emergencies to one that is proactive in reducing pollution, improving stream health and maximizing the performance of the drainage system. It is important that this occur in a fiscally responsible manner. The following additional points of consensus were reached by the Committee regarding the stormwater program that should be invested in and implemented by the Town.

General Program Guiding Principles:

- Based on the work of previous stormwater committees and the work completed over the past year, the Committee believes strongly that the most important priority for the stormwater management program is a comprehensive master planning effort to guide the Town's stormwater management program. It is anticipated that the effort will require substantial time, effort, and funds.

- In keeping with the idea that the citizens must believe that the utility is operating in the citizens' best interests, the Committee recommends that the Town Council appoint an Advisory Committee from the citizenry.

- Address, on an equal basis, both stormwater quantity and stormwater quality.

- Formalize an organizational structure and provide staff to take leadership in managing the Stormwater Program.

- Develop and implement a public education and involvement program.

- Provide for stable, long-term funding of the Town's stormwater program to ensure maintenance and capital needs are met.

Engineering/Modeling/Planning

- Complete an inventory of the stormwater system for both regulatory needs and for development of master planning for the utility and other Town stormwater management issues.

- Complete drainage Master Plans for large and small basins. Provide access to the basin models and Master Plans available to the development and engineering communities, using the website or other similar technology.

- Develop and implement Stormwater Management Plans and comply with NPDES Phase II rules.

- The master planning effort should be highly collaborative involving the participation of stakeholders.

Operations

- Perform remedial repair work and upgrades on the storm sewer system while addressing the backlog of capital improvements.

- Provide equitable maintenance to:
  - Systems within the Town's corporate boundaries,

- Portions of the system for which the Town does not have easement but which carry public water,
- Portions of the system for which the Town has an established drainage easement,
- Ditches adjacent to DOT right-of-ways, and
- Required BMP structures in residential subdivisions.

❖ Provide additional staff and equipment, as needed, for enhanced maintenance program and for remedial repairs.

Funding

❖ Base the cost of service to properties on imperviousness, the ability of a surface to absorb water. This provides:
- Fairly distributed costs,
- Encouragement to limit the amount of impervious surface area in new development, and
- Encouragement to leave property undeveloped.

❖ The Town should establish a credit policy for those properties that reduce the demand for stormwater service. The Committee recommended that the credit program provide the following criteria:
- A property owner can qualify for a credit not to exceed 25% of their annual fee.
- The property owner must, in some way, be actively reducing the municipality's cost of providing stormwater services.

❖ To support the Town's comprehensive stormwater program, the Chapel Hill user fee billing unit be set at at 2,000 square feet or portion thereof, to be billed in the most cost effective manner (i.e., on the county tax bill). Residential properties should be capped at three (3) billing units, based on the analysis of the consultant team of the universe of single family residential properties in the Town.

❖ Establish and maintain the user fee consistently for a three to five year period with a review of the program annually to assess the need for adjustment.

University of North Carolina

❖ The Town and the University should develop an effective, close working relationship in support of stormwater management community-wide. The systems are inter-dependent and should be managed in a cohesive manner.

The Committee recognizes that it will take time and effort to make the transition to a proactive stormwater management program and that a significant amount of planning, measurement, and reporting will be required. The members volunteered to be "on call" to the Town in the event their help is needed until an Advisory Committee is appointed for the Utility.

Introduction to Policy Discussion Papers

As part of the utility implementation process, the Town staff, the Stormwater Policy Review Committee, and the consultant worked together to develop policy statements to guide the formation of the utility. This process involved identifying, examining and discussing issues related to various topics including: the mission, existing problems and needs, required program elements, rates, and financing for a comprehensive stormwater program for Chapel Hill. The following pages include the documents produced to reflect the discussions and recommendations to date on each policy topic. Specific papers are included on:

- The mission of the comprehensive stormwater management program
- The role of the town and its stakeholders in implementing and maintaining an effective utility-based stormwater program
- The stormwater program priorities to be used as the foundation for the development and implementation of the utility-based stormwater management program. This list includes ten specific priorities in order of their importance.
- A summary of the stormwater-related problems, needs and issues currently facing the Town. This paper covers the gamut of stormwater functions including regulatory requirements, water quality and water quantity controls, capital improvement needs, and operational challenges.
- The key elements of the comprehensive management program (with their recommended level of expenditure) required to address the stormwater priorities and needs previously identified.
- An analysis of the stormwater funding options available to the Town, and
- A discussion paper on rate base for the utility.

Mission and Roles

THE MISSION

It is the mission of this comprehensive stormwater management program to:
protect the health and safety of both the public and the ecosystem;
address both stormwater quality and stormwater quantity concerns, and
meet or exceed Federal and state mandates regarding stormwater.

THE ROLES

It is the intent of this program to meet the Mission in a cost-effective and fiscally responsible manner using a dedicated utility-based funding source and a mix of public and private investment in the system. The program addresses both existing and new development and combines new and existing program activities. The Town of Chapel Hill will provide leadership for the Town's stormwater program. Staff will provide the technical expertise and direction for Town-provided services. Coordination on issues, policies and service delivery are the responsibility of the stormwater program manager.

The program implementation, management and maintenance of the system, performed by the Town or by contract, will be performed on Town property, Town-owned rights-of-way and on public and/or private property to the extent defined by the level and extent of service policies.

The following table provides an understanding of the roles of the Town and other stakeholders in the community (e.g. residents, developers, university, etc.) for overall stormwater management within Chapel Hill.

Service	Town's Role	Community Stakeholders' Role
Water Quality Services	Meet or exceed regulations, inspect and enforce ordinances and permit conditions. Initiate studies; establish performance standards. Assist private and public sectors in protection of surface waters, greenways, and riparian habitat. Educate public.	Meet or exceed regulations. Maintain water quality structural controls as required. Participate in public involvement activities. Report and remedy problems.
System Engineering Services	Maintain current level with enhancements to serve public more effectively. Maintain technical competency. Establish system performance standards. Manage and protect riparian corridors and floodplain.	Design expansions; meet regulatory standards.
System Maintenance Services	Maintain public system, both remedial and routine. Establish standards for performance.	Maintain privately owned system elements to required standards.
System Capital Improvement Program (CIP) Services	Master Plan, design, contract, construct, inspect and accept for public dedication.	Design and construct in accordance with Town standards. Comment on and support CIP.
System Expansion	Expand capacity; upgrade and retrofit the existing system.	Construct/expand new facilities to serve development

Stormwater Program Priorities

This policy paper summarizes priorities developed by the Town's Stormwater Utility Development and Implementation Study Committee in the spring and summer of 2001 and reflects work of earlier Stormwater Advisory committees and discussions with Town staff. ***It is presented here as recommendations finalized and prioritized by the Policy Review Committee of 2003. These priorities will be the foundation for the development of the utility-based stormwater management program services***

1. **Develop and implement a comprehensive Stormwater Program Master Plan that supports all of the stormwater program priorities.**

   A Stormwater Master Plan will be developed based on the Mission and Program Priorities for the stormwater management program. It will set out the activites to be undertaken in line with the priorities and a time schedule and resources needed to accomplish the various elements of the stormwater management program. The Stormwater Master Plan will help guide the implementation of the stormwater management program over the long-term.

2. **Address stormwater quantity (flooding) as an integral component within the program.**

   The stormwater management program will be enhanced to include comprehensive long-range management efforts to minimize flood risks and the many effects of flooding. These efforts include prioritizing and addressing stormwater infrastructure needs such as maintenance, repair, replacement, upgrades and capital improvements.

3. **Address stormwater quality as an integral function within the program**.

   The stormwater management program will continue to address stormwater ***quality.*** This applies to water quality regulatory demands, as well as to erosion and sediment controls and to stream and aquatic system health. The stormwater management program will recognize and move toward the goals of the Town's Year 2000 Comprehensive Plan.

4. **Protect and restore natural stream corridors.**

   The health of the aquatic ecosystem is dependent on both quality and quantity management. The Town's stormwater management program will address both infrastructure concerns and aquatic habitat health.

5. **Develop a formal public education and involvement program.**

   Stormwater education efforts will identify key stakeholders, including institutions, development and business communities, and the general public. Education efforts will focus on both causes and solutions for stormwater problems, including possible regulatory remedies. The goal will be to establish a clear understanding that stormwater and surface water systems are a public resource to be protected and managed in the public interest.

6. **Define the level of service and performance standards for the Town's Stormwater Program.**

   The stormwater management program will plan, prioritize, design and construct system improvements at a pre-determined level-of-service that is considered to be appropriate for public and private drainage systems. Defining the level and extent of service and performance for the Town's drainage system provides valuable guidance about how and where stormwater management is to be delivered and enforced.

7. **Ensure compliance with Federal and State regulatory mandates.**

   The stormwater management program will implement reasonable regulatory programs that comply with stormwater quality mandates from Federal and State, agencies, and will address floodplain management requirements.

8. **Establish clear stormwater program leadership that the public recognizes**.

   The stormwater management program will clearly identify point(s) of contact responsible for system planning, regulatory compliance and enforcement, system design, construction and maintenance, and addressing stormwater concerns from the public.

9. **Integrate programs to utilize resources efficiently.**

   The stormwater management program will minimize duplication and inefficiencies in the management and implementation of the various stormwater elements in order to improve the overall cost-effectiveness of the program and to optimize the use of already scarce resources. It will promote integrated programs and inter-jurisdictional cooperation aimed at ensuring a positive public reception to the program.

10. **Establish an understanding of the stormwater system as a "utility".**

    The stormwater management program will be funded, at least in part, by the creation of a utility, providing a stable, dedicated funding source like those already in place for other services (i.e. water, sewer, gas, electricity)

Problems, Needs, and Issues

This paper briefly outlines the key stormwater issues identified in the course of staff interviews with the Town related to their current stormwater program. Problems, needs and service issues are summarized and categorized into the functional cost centers that together comprise the stormwater management program.

I. Administration

Currently, the Engineering Department is taking the lead in developing the Town's comprehensive stormwater management program. However, a single point of public contact or leadership has not yet been established for the comprehensive program. This is due to the variety of departments which handle stormwater related issues - from development permits to inspections to maintenance. Complaint calls are currently fielded by the Engineering Department, the Public Works Department, the Town Manager's Office, the Town Clerk's Office, the Planning Department, and the Inspections Department, with no central means of tracking the issues and responses.

One critical component of stormwater administration is the political and public support for the program. There are numerous stormwater issues that will have a direct impact on Chapel Hill including long-term master planning and engineering, stormwater quantity and quality control management, water-supply and watershed issues, ecosystem protection or restoration, and Federal and State stormwater regulatory requirements. Political and public support is essential in building and funding a comprehensive stormwater management program that addresses all these issues. It is important to clearly establish a primary point of contact within the Town, either an individual or an office that can be identified to the public for all concerns, issues, information and assistance for stormwater. The primary point of contact could address questions by routing to the appropriate departments, tracking responses, and following up to ensure that the appropriate service was delivered.

A senior manager needs to be designated as the coordinator and primary contact for the new program. Due to the new workload associated with the comprehensive program, this manager should have appropriate support staff and accessible office space.

II. Special Programs

This functional cost center focuses on unique program elements that serve all other elements of a comprehensive stormwater management program. Special programs generally include public education, information management, drainage assistance programs, and floodplain management through hazard mitigation.

A. Public Education is a crucial component of a successful comprehensive stormwater management program. Public education and participation is a new mandate under NPDES Phase II that requires additional funds to develop the new program. It is also an issue due to the lack of public knowledge of the Town's stormwater management policies and how their actions affect the operation and maintenance of the storm drainage system. The Town has approved a new plan for public education, related specifically to stormwater, and development of this plan is underway at the present time. Public education and outreach need to be considered a permanent addition to the stormwater management program and must be flexible enough to deal with new issues and changing public perception. Developing and managing this program will require additional funding.

B. The Drainage Assistance Program has been recognized by staff as an important and cost effective component of a comprehensive stormwater management program. However, the program is currently not receiving funding at levels characteristic of the recent past. From the staff point of view, this program offers a major opportunity to provide improved and enhanced service, is good PR, and requires adequate funding to be effective.

C. Technology Issues - The use of geographic information systems (GIS) as a tool for stormwater management and related database management continues to evolve in the Town. As technologies improve and more complex data sets are established, additional staff, equipment and software will be required for GIS database management, staff training, service request tracking, website applications, and construction/maintenance project planning and tracking.

D. Floodplain management through hazard mitigation is an area that staff thinks needs development, management and funding. As part of the Federal Emergency Management Agency (FEMA) requirements for emergency response, communities must have a Hazard Mitigation Plan in place. The plan identifies means and measures the community will use to mitigate impacts from flooding and other natural disasters and to administer the National Flood Insurance Program (NFIP). The activities associated with the plan will require coordination between the local stormwater management program and Town/County/State emergency management agencies.

E. The Town does not currently have a designated stream restoration program. Town activities associated with stream restoration are limited and are applied on an "as needed" basis, typically in response to citizen complaints. Staff expressed a need to identify and prioritize stream reaches and riparian areas in need of restoration for water quality or quantity purposes and to develop a plan of action for future restoration projects, including funding for easement acquisition, restoration design, and construction.

III. Stormwater Quality Management

The purpose of this functional cost center is to highlight current operations that monitor and reduce the pollutants in stormwater and impact water quality. This includes Chapel Hill's Water Quality Testing Program, enhanced development review requirements, erosion and sediment (E&S) control, and compliance with specific regulations such as the NPDES Phase II program. To ensure that Town facilities/operations and private development projects are and remain in compliance with the NPDES II regulations and the Town's Land Use Management Ordinance, and to protect streams and aquatic habitat, a more robust water quality monitoring and mitigation program is needed in Chapel Hill.

A. Illicit Connections - The Town is required to develop a plan to identify and eliminate illegal or illicit connections to the drainage system. This includes mapping of outfalls and enforcing appropriate ordinances to eliminate such connections once identified. The Town submitted its application for its NPDES II regulations March 10, 2003 and is awaiting approval of the application. Once approved, the permit will allow the Town five years to fully implement a plan that must continue in perpetuity. Mapping is currently ongoing, but additional resources will be needed for staff training, enforcement and mitigation activities.

B. Industrial Permit Compliance - The NPDES II rules require municipal facilities such as maintenance yards, garages, and treatment plants to apply for Industrial Permits. These permits require inspections of facilities, development of appropriate operating procedures, implementation of "good housekeeping" practices, training of staff, and annual reporting. The Town will need to Incorporate Industrial Permit related training into existing training activities and based on review of standards of practice in other North Carolina communities, develop and implement standards for Town maintenance and operations activities.

C. Erosion and Sediment Control - Currently the Town's soil erosion and sedimentation control (SES) regulations are enforced by Orange County. Because County erosion and sedimentation control personnel are limited and spread out countywide, consistent compliance with the regulations cannot be assured at all times in Chapel Hill. Adding a Town inspector working with the County staff. would help improve local oversight and enforcement.

IV. Engineering, Planning, and/ Inspections

The Engineering, Planning, and Inspections functional center generally includes technically focused services to process applications for development and to protect end-users of buildings and structures by ensuring that construction standards are met. This includes but is not limited to ensuring that design standards for new

development are met, designing and implementing capital improvements, long-term natural resource and infrastructure planning, and inspections.

The Engineering, Planning, and Inspections Departments do a good job in reviewing new development plans and ensuring that new development complies with the existing Town standards; however, due to the volume of plans needing approval, this process is often slower than applicants would like. Staff recommends additional resources be allocated to meet the increasing demand and to meet the requirements to have plans reviewed in a timely manner. Also, clarification and updating of design standards will assist the review and inspection staff in carrying out their responsibilities for the community at large.

B. The Town will continue to be challenged to balance existing conditions with new development and to ensure that compliance with stormwater quality requirements is not unduly borne by the areas of new development. The Town should review policies and practices with a focus on balance to ensure that equity is addressed for all those benefiting from improved water quality and quantity controls. Master Plans should incorporate water quality as well as water quantity concerns to ensure that existing development is evaluated for opportunities to address both issues. As new programs are initiated to comply with requirements, the Town will be well served to have the development community participate in program design. A detailed Master Plan for Stormwater would presumably involve the Planning Department, Engineering Department, and the Public Works Department and would include the study of all community stormwater management system components including streams, drainage basins, engineered structures, riparian areas, and other infrastructure

V. Operations

The Operations functional center includes operating and maintaining the current public storm drainage system. In the Town of Chapel Hill, this is primarily the responsibility of the Public Works Department. In general, the Town does a good job of maintaining the storm drainage systems on Town-owned property and also operates a Drainage Assistance Program for some privately owned properties that qualify for the program.

A. Extent of Service Issues - Stormwater services are being provided within defined boundaries, both formally established and informally established, which may have, over time, created inequities in service coverage. The general public does not understand why they are unable to have their stormwater problems solved if their property borders a public right of way owned by the NCDOT or is in the Urban Services Area, outside the town limits. To the citizen, the ownership of the right of way is irrelevant. They financially support the service provided by the Town the same way a citizen whose property is located on a Town-maintained street. It

is recommended that the Town increase services adjacent to the NCDOT rights-of-way and that areas outside the town limit are excluded from the utility fee structure.

Maintenance of the drainage system located on private property is limited by rights of access or by whether "public water" flows through the channel or pipe. As water quality and quantity controls become more prevalent the Town will need to address long-term maintenance responsibilities on private property through increased enforcement actions or through dedication of facilities to the public. Currently, the Town assumes responsibility/liability only within dedicated "public" easements or public rights-of-way/property

B. Level of Service Issues – Staff performed numerous activities related to maintaining the overall performance of the public drainage system. These may include issues with debris in the channels, sediment build-up, under-sized systems, lack of access for maintenance personnel, expansion of system responsibility through annexation, and system location under structures. The Public Works Department provides a high level of service, but is often reactive, instead of proactive, and cannot address all the issues confronting the community with their existing resources.

Current needs include additional funds for the Drainage Assistance Program, additional funding for new crews or contract services and one additional jet vacuum truck.

VI. Regulation and Enforcement

Regulation and enforcement involve State and Federal mandates (NPDES Phase II regulations and Water Supply Watershed regulations), erosion and sedimentation control regulations, and a variety of regulations included in the Town's Land Use Management Ordinance and Code that relate directly or indirectly to stormwater management.

Through plan review and inspections, County oversight of the erosion and sediment control rules, and Town enforcement of the Land Use Management Ordinance, Chapel Hill complies with the requirements of current regulations. However, the Town has prepared and submitted a NPDES Phase II permit application in which it commits to addressing the following six minimum measures: (1) public education, (2) public involvement/participation, (3) illicit discharge detection and elimination, (4) construction site stormwater runoff control, (5) post-construction stormwater management, and (6) pollution prevention/good housekeeping.

By adding some resources, as identified in previous portions of this summary report (public education funds, additional inspectors and master plan activities), it is

expected that the Town would be able to meet the basic requirements of the Town's NPDES Phase II permit application.

VII. Capital Improvements

Capital improvements associated with the Town's Stormwater Management Program involve major drainage system construction and/or renovation projects that are necessary to address deficiencies in system condition and/or performance or to mitigate identified problems caused by the existing system. Extraordinary maintenance (i.e. other than routine maintenance) activities may also be identified as capital improvement projects.

In 1996 the Town issued Street Improvement Bonds allocated for drainage projects of $500,000, of this about $460,000 of the bonds have been spent, leaving a balance of about $40,000. The Town, however, has identified more than $675,000 in unmet drainage improvement capital projects and there is a second list of drainage assistance capital projects where the dollar values have not been determined (see attachment). For reference, just two of the major recent needs (assistance to Eastgate Shopping Center and work on Burning Tree Drive) required funding of more than double the funds available from the bonds. There do not appear to be any other funds earmarked to handle another emergency if it arises. A dedicated funding source is needed to provide emergency funds and money for new and existing major capital improvement projects (CIP).

VIII. Finance and Billing

Costs for financial administration and billing services will depend on the final method chosen for managing the utility billing system. Options include placing the stormwater fee on a local utility bill, on the county tax bill, or establishing an independent billing system solely for the stormwater utility bill. Based on experience with other stormwater programs in North Carolina, billing costs vary from about $40,000 to $80,000 per year, not including costs for additional staff that may be necessary. Ongoing costs will be incurred for updating aerial photography and managing data upon which the utility rate is established.

TOWN OF CHAPEL HILL
CAPITAL IMPROVEMENT PROJECTS – STORMWATER

Bolingwood Drive bridge	$460,000
Booker Creek Road Culvert Replacement	$225,000

TOWN OF CHAPEL HILL DRAINAGE ASSISTANCE PROGRAM		
LOCATION AND DESCRIPTION	**ESTIMATED COST**	**SCORE (LOW, MODERATE, HIGH)**
Replace culvert and make channel improvements at: Burning Tree Drive	$100,000	HIGH
Install pipe at: 105 St. Andrews Place	2,500	MODERATE
Replace pipe at: 214 Sharon Road	7,600	MODERATE
Install curb inlets on: Rosemary Street	9,350	MODERATE
Slip-line pipe at: 1605 Ferrell Road	9,500	MODERATE
Replace pipe at: Piney Mountain Road	11,200	MODERATE
Perform various flood mitigation at: Mitchell Lane	22,000	MODERATE
Erosion at: 1709 Audobon Drive	3,500	LOW
Stabilize channel at: 221 Scarlett Drive	750	LOW
Erosion at: 203 Woods Circle	4,100	LOW
Stabilize channel at: 102 Old Forest Creek	9,300	LOW
Slip-line pipe at: 913 Roosevelt Drive	10,450	LOW
TOTAL	$190,250	

Program Elements

This paper discusses key elements and associated costs necessary to address Stormwater Management Program priorities previously identified by the Committee and Town staff. The discussion is general in nature with supplemental details included to differentiate between a "minimal approach", a "moderate approach" and an "aggressive approach" for provision of stormwater management services within the Town's jurisdiction. The cost estimates are based on the Consultant's experience with similar stormwater management programs operating in other communities and related to the Town of Chapel Hill.

The Program development involves a "building block" approach in which the foundations of the Program are laid while the most pressing current problems are addressed at an adequate level. The distribution of costs associated with the Program efforts will change as we identify and focus on those Program elements that will be approached aggressively at the outset of the Program implementation, and those for which action will be deferred until future years as the Program develops.

Each Program priority is addressed with consideration given to the Committee's input on program priorities and appropriate response strategies. The currently proposed Program does not include costs for accounting, general overhead, or other miscellaneous Program costs that may be incurred depending on the final stormwater utility that is implemented.

Planning, Modeling, and Engineering

– Priority # 1: Develop and implement a comprehensive Stormwater Program Master Plan that supports all of the stormwater program priorities.

Master planning has been identified as the top priority element of Chapel Hill's Stormwater Management Program. A comprehensive master planning effort will provide the essential road map for developing and managing all aspects of a successful stormwater program. It is anticipated that this effort will require substantial time and resources, including the active participation of a stakeholder advisory group. The master plan would establish priorities for subsequent modeling and engineering work. The master planning process will be guided by an advisory committee consisting of members that represent all major stakeholder groups.

Minimal Aggressive master planning, followed by minimal implementation: By year 2011 Town staff would complete or up-date hydrologic, hydraulic and water quality computer models and GIS coverage's of the four (4) largest drainage basins within the Town's Planning Jurisdiction, limiting analysis to the major tributaries. This will not provide the analysis of smaller watershed and basins but will provide a broad look at the issues within major watersheds such as Bolin, Booker, Morgan, and Little Creeks. Based on the analysis, basin plans describing conditions and activities in the major basins would be completed by this date.

Moderate: Aggressive master planning, followed by the same degree of implementation as Minimal, except that modeling and planning for the largest drainage basins would be completed by 2008, rather than 2011. The use of consultants would be necessary to gather information, calibrate models and develop basin plans. Smaller basins will be modeled on a priority basis. Begin to install a limited number of telemetered rain and stream gauges and sampling technologies in major basins.

**Aggressive: Aggressive master plan, followed by the same degree of implementation as in Moderate, except that modeling and planning for the largest drainage basins would be completed by

2006. A schedule would be established to complete modeling and basin plans of sub basins by year 2008. Install rain and stream gauges as necessary to collect data for analysis of smaller basins.

Minimal	Moderate	Aggressive
$40,000	$200,000	$325,000

Development Review - Priority #4: Protect and restore natural stream corridors.
- Priority #6: Define the level of service and performance standards for the Town's Stormwater Program.
- Priority #7: Ensure compliance with Federal and State regulatory mandates.

Development review for stormwater management and Resource Conservation District regulations has increased significantly with the adoption of the Land Use Management Ordinance. Application of the regulations requires significant staff time and resources to meet with developers, other Town staff and contractors and to perform comprehensive development plan reviews to ensure compliance with the Ordinance.

Minimal: Utilize existing Town staff to meet with developers and to review development plans for compliance with the Land use Management Ordinance requirements.

**Moderate: Same as Minimal with the addition of one staff engineer in the Engineering Department responsible for reviewing development plans, performing limited site inspections and providing technical assistance to staff and developers regarding compliance with the stormwater management related regulations in the Town's Land Use Management Ordinance.

Aggressive: Same as Moderate with the addition of one technician in the Engineering Department. The staff engineer and technician would share responsibilities for plan review and field inspections to verify compliance. Technician would perform selected follow-up inspections to verify ongoing performance and condition of stormwater management facilities installed during initial construction.

Minimal	Moderate	Aggressive
$0	$60,000	$90,000

Water Quality

To ensure that Town facilities/operations and private development projects are and remain in compliance with the NPDES-II regulations and the Town's Land Use Management Ordinance, and to protect streams and aquatic habitat, a more robust water quality monitoring and mitigation program is needed in Chapel Hill. The following key areas must be implemented and/or enhanced.

Illicit Connection Detection and Elimination
- Priority #3: Address stormwater quality as an integral function within the program.
- Priority #7: Ensure compliance with Federal and State regulatory mandates.

The Town is required to develop a plan to identify and eliminate illegal or illicit connections to the drainage system. This includes mapping of outfalls and enforcing appropriate ordinances to eliminate such connections once identified. The NPDES-II regulations allow the Town five years to fully implement a plan that, once approved, must continue in perpetuity.

**Minimal: By year 2005, the Town would have the ordinance amended to meet the NPDES Phase II minimum measure, storm sewer inventory completed and staff trained and in the field to identify

existing or potential illicit discharge problems. Follow up, enforcement and mitigation activities would occur as time and resources allow.

Moderate: Same as Minimal and including an enforcement mechanism for illicit discharge identification, sampling and enforcement actions that would be implemented by year 2006. An additional technician would be added to the Engineering Department to perform onsite problem analyses, identify pollution source(s), propose appropriate mitigation measure(s), and initiate enforcement action as necessary. Also, a public education program would be created to provide specific information about illicit connections and their potential impacts.

Aggressive: Same as Moderate with additional water quality testing to better identify the types and level of pollutants that are present in streams, and where pollution source(s) might originate.

Minimal	Moderate	Aggressive
$30,000	$70,000	$90,000

Industrial Permit Compliance/Good Housekeeping Program

- Priority #7: Ensure compliance with Federal and State regulatory mandates.

The NPDES-II rules require municipal facilities such as maintenance yards, garages, and treatment plants to apply for Industrial Permits. These permits require inspections of facilities, development of appropriate operating procedures, implementation of "good housekeeping" practices, training of staff, and annual reporting.

**Minimal: Incorporate Industrial Permit related training into existing training activities with some minimal funding for printing or purchasing materials. Inspect Town buildings as part of routine maintenance procedures, and identify problems. Based on review of standards of practice in other North Carolina communities, develop and implement standards for Town maintenance and operations activities.

Moderate: Same as Minimal except develop more formal and detailed training program with specific materials provided to inform employees about water quality issues and standards for maintenance and operations activities. Hire a consultant to inspect key Town facilities every two years to identify existing and/or potential problems.

Aggressive: Same as Moderate except hire consultant to audit all Town facilities each year to identify existing and/or potential problems. Consultant would also be hired to provide comprehensive training for Town employees.

Minimal	Moderate	Aggressive
$2,000	$10,000	$15,000

Erosion and Sediment Control - Priority #3: Address stormwater quality as an integral function within the program.

- Priority #7: Ensure compliance with Federal and State regulatory mandates.
- Priority #9: Integrate programs to utilize resources efficiently.

Currently the Town's soil erosion and sedimentation control (SES) regulations are enforced by Orange County. Because County erosion and sedimentation control personnel are spread out countywide, compliance with the regulations cannot be assured at all times in Chapel Hill.

Minimal: Utilize existing Engineering Inspectors and Building Inspectors to identify major SES violations as part of routine site inspections, and report violations to County SES staff for follow-up action(s).

**Moderate: Same as Minimal with the addition of one SES inspector in the Engineering Department who would focus on identifying violations of SES regulations or non-compliance with approved Erosion Control Plans, and would report violations to County SES staff. This inspector would follow-up with County staff and with the responsible parties to facilitate implementation of appropriate mitigation measures in a timely manner.

Aggressive: Same as Moderate with one additional SES inspector in the Engineering Department. The Town would assume full responsibility for enforcement of SES regulations within its Planning Jurisdiction, including identification of violations and implementation of mitigation measures. The Town Code would need to be revised to reflect assumption of new responsibilities by the Town.

Minimal	Moderate	Aggressive
$0	$ 60,000	$ 120,000

Operations – Priority #2: Address stormwater quantity (flooding) as an integral component within the program.
- Priority #3: Address stormwater quality as an integral function within the program.
- Priority #6: Define the level of service and performance standards for the Town's Stormwater Program.

Operations inherently involve issues of the extent of service, the level of service and the investment in the drainage system through maintenance and repair activities. The extent of service is used to identify and differentiate between public, private and shared-responsibility parts of the community drainage system. Currently, the Town typically operates and maintains only those parts of the drainage system that are within Town-owned properties and rights-of-way, and/or are within public easements on private property where the drainage system is conveying stormwater runoff originating on public property. The level of service defines the responsiveness, in terms of time and methods, of the Town's drainage system maintenance and repair activities.

Minimal: Existing Town staff and equipment resources would continue the current extent and level of service and investment in drainage system maintenance and repairs. The current street sweeping program would be evaluated and adjusted as necessary to optimize water quality benefits.

**Moderate: Same as Minimal with the addition of a three-person construction crew (supervisor and two laborers) and equipment in the Public Works Department to expand the general maintenance and repair of the community drainage system and to increase inspection and cleaning of the pipes, culverts, catch basins, inlets, ditches and streams, including facilities on selected State roads. A primary objective of the additional construction crew would be to address the backlog of identified drainage system repairs.

Aggressive: Same as Moderate with additional funding for private contract work as needed to supplement Town resources in performing identified drainage system construction, repair and maintenance activities and to provide supplemental street sweeping.

Minimal	Moderate	Aggressive
$10,000	$150,000	$210,000

Special Programs

Special programs include such activities as public education, drainage assistance, hazard mitigation, stream inventory/assessment, and technology enhancement. Some of these activities, such as public education/outreach and stream inventory/assessment are regulatory requirements under the National Pollutant Discharge Elimination System, Phase II (NPDES) permit program and are also identified community priorities. Improved technology utilization will increase both the efficiency and the effectiveness of Program service delivery, allowing the Town to transition from reactive to proactive responsiveness.

Public Education and Outreach - Priority # 5: Develop a formal public education and involvement program.

Minimal: $0.25 per year per capita would provide for production and direct mailing of a limited number of printed Program materials. This level would meet the minimum standards established for NPDES model programs.

Moderate: $0.50 per year per capita would make it possible to utilize multiple media sources to distribute a variety of Stormwater Management Program messages and information of importance to the community.

**Aggressive: Same as Moderate with the addition of one administrative staff position in the Engineering Department to develop and coordinate public education and outreach activities, volunteer efforts, and training programs associated with stormwater management issues and concerns. It has been shown in other programs that engaging citizens, schools, and businesses is a cost effective approach to improving Program performance and effectiveness.

Minimal	Moderate	Aggressive
$ 12,500	$ 25,000	$ 64,000

Drainage Assistance Program – Priority #6: Define the level of service and performance standards for the Town's Stormwater Program.
– Priority #9: Integrate programs to utilize resources efficiently.

The Drainage Assistance Program is an effective means of responding to citizens' requests-for-assistance by providing technical advice to residents at no cost, and sharing in the costs of repair or replacement of qualified storm drainage facilities serving primarily private properties. The Town has an adopted policy outlining a local Drainage Assistance Program; however, the program is not currently funded. This program may include retrofits, new construction or maintenance of existing facilities for water quantity or quality improvements.

Minimal: Provide for a few minor projects, which would benefit more then one property.

**Moderate: Perform up to two minor projects and one major project per year.

Aggressive: Perform up to three minor projects and two major projects per year.

Minimal	Moderate	Aggressive
$ 15,000	$ 60,000	$ 100,000

Hazard Mitigation and Floodplain Management – Priority #2: Address stormwater quantity (flooding) as an integral component within the program.

As part of the Federal Emergency Management Agency (FEMA) requirements for emergency response, communities must have a Hazard Mitigation Plan in place. The plan identifies means and measures the community will use to mitigate impacts from flooding and other natural disasters and to administer the National Flood Insurance Program (NFIP). The activities associated with the plan require coordination between the local stormwater management program and Town/County/State emergency management agencies.

Minimal: Prepare a Town Hazard Mitigation Plan and update it as necessary for changing conditions and regulations. Utilize State and Federal flood maps and models only. Administer the NFIP program at a minimal level, including use of the existing Cooperating Technical Community (CTP) agreement between Chapel Hill, Carrboro and FEMA.

**Moderate: Same as Minimal plus gather additional, detailed drainage system information including data necessary for watershed modeling and master planning, in addition to the State flood maps. Expand inter-jurisdictional cooperative efforts to promote efficient, integrated hazard mitigation and stormwater management programs. Apply for cost-share grants with the NC Division of Emergency Management for limited mitigation measures. Administer the local NFIP program at a higher level of participation including the Community Rating System (CRS) and the Increased Cost of Compliance (ICC) strategies.

Aggressive: Same as Moderate with increased level of data collection necessary for watershed modeling, master planning, and implementation of increased mitigation measures. Provide leadership role in establishing functional, cooperative, inter-jurisdictional endeavors that will benefit all jurisdictions. Utilize digital aerial photography and geographic information system software to expand and automate analyses of local and regional stormwater management issues.

Minimal	Moderate	Aggressive
$40,000	$100,000	$160,000

Stream Restoration Program - Priority #3: Address stormwater quality as an integral function within the program.
- Priority #4: Protect and restore natural stream corridors.

The Town does not currently have a designated stream restoration program. Town activities associated with stream restoration are limited and are applied on an “as needed” basis, typically in response to citizen complaints.

Minimal: Identify and prioritize stream reaches and riparian areas in need of restoration for water quality or quantity purposes. Develop a plan of action for future restoration projects.

**Moderate: Same as minimal with additional funding for easement acquisition, restoration design and one restoration project per year.

Aggressive: Same as moderate with additional funding for two or three restoration projects per year.

Minimal	Moderate	Aggressive
$10,000	$50,000	$75,000

Technology Utilization – Priority #8: Establish clear stormwater program leadership that the public recognizes.
- Priority #9: Integrate programs to utilize resources efficiently.

The use of geographic information systems (GIS) as a tool for stormwater management and related database management continues to evolve in the Town. As technologies improve and more complex data sets are established, additional staff, equipment and software will be required.

**Minimal: Purchase and utilize advanced computer software for GIS database management, staff training, service request tracking, website applications, and construction/maintenance project planning and tracking.

Moderate: Same as Minimal with the addition of contracted assistance from an information system consultant to customize the software application(s) for specific Town needs and conditions. Funding would be programmed for technology updates and support and for employee training.

Aggressive: Same as Moderate with the addition of contracting for consultant services to develop sophisticated computer modeling tools for master planning and watershed analysis. Funding would be programmed to update modeling software, to secure additional software application services, and for training of employees as necessary.

Minimal	Moderate	Aggressive
$20,000	$50,000	$70,000

Capital Improvements – Priority # 1: Develop and implement a comprehensive Stormwater Program Master Plan that supports all of the stormwater program priorities.
- Priority #2: Address stormwater quantity (flooding) as an integral component within the program.
- Priority #3: Address stormwater quality as an integral function within the program.
- Priority #4: Protect and restore natural stream corridors.
- Priority #9: Integrate programs to utilize resources efficiently.

Capital improvements associated with the Town's Stormwater Management Program involve major drainage system construction and/or renovation projects that are necessary to address deficiencies in system condition and/or performance or to mitigate identified problems caused by the existing system. Extraordinary maintenance (i.e. other than routine maintenance) activities may also be identified as capital improvement projects.

In 1996 the Town issued Street Improvement Bonds allocated for drainage projects of $500,000, of this about $460,000 of the bonds had been spent through May, leaving a balance of about $40,000. The Town, however, has identified more than $675,000 in unmet stormwater improvement capital projects. Also, there are no funds earmarked to handle major emergency repairs. A dedicated funding source is needed to provide emergency funds and money for new and existing major capital improvement projects (CIP).

The Town currently requires dedication of easements on new drainage systems as part of the development approval process. However, the Town does not currently have legal access to many older sections of the publicly maintained drainage system. The growth of the Town continues to place a burden on the older sections of the drainage system and funding is needed for system reconstruction and rehabilitation improvements to maintain reasonable levels of performance and flood protection.

**Minimal: Provide $200,000 per year dedicated to capital improvement projects. These funds could be utilized as direct payment for improvements or for payment of interest on loan or bond debt necessary to fund larger and more costly improvement projects that may be necessary.

Moderate: Same as Minimal except increase annual expenditure for capital improvement projects to $400,000 a year.

Aggressive: Same as Moderate except increase annual expenditure for capital improvement projects to $600,000 a year.

Minimal	Moderate	Aggressive
$200,000	$400,000	$600,000

Administration:

Leadership is a key Program element necessary to provide the community with a clearly identified point of contact and to assume oversight responsibility for effective stormwater system planning, regulatory compliance, system design/construction/maintenance, and enforcement of standards. In addition, Program leadership is critical for effective coordination with other municipalities, Orange and Durham counties, State and Federal agencies, and organizations involved with protection of water supply watersheds such as the Cape Fear River Basin and Jordan Lake.

Program Coordinator – Priority #8: Establish clear stormwater program leadership that the public recognizes.
– Priority #9: Integrate programs to utilize resources efficiently.

It is not proposed that the Town centralize, by reorganization, the services currently provided by the Public Works Department and the Engineering Department; but rather establish a leadership position within the existing organization that would be responsible for organizing and coordinating delivery of comprehensive stormwater management services to the community using available Town resources supplemented by contract services.

In addition to a Program leadership position, additional technical and administrative support staff will be necessary to manage the Program at the different levels of involvement described below:

**Minimal: Modify job description for current Stormwater Engineer in the Engineering Department to include oversight responsibility for the entire Stormwater Management Program. Add one technician position in the Engineering Department to assist with regulatory compliance, field inspections, water quality sampling, and responding to citizen requests-for-assistance.

Moderate: Same as Minimal with two additional staff positions in the Engineering Department: An additional technician would be necessary to increase water quality testing, to inspect and evaluate identified water quality and quantity problems, and to provide additional field inspection capability with regard to regulatory compliance. An administrative staff position would be necessary to manage increased reporting requirements, to track responses to reported problems, to assist with development plan review, to coordinate an expanded public education program, and to oversee a stormwater management "hotline" to be added in the Engineering Department.

Aggressive: Same as Moderate with one additional technician position in the Engineering Department to coordinate Program-related construction activities including both design work and field inspections.

Minimal	Moderate	Aggressive
$40,000	$110,000	$150,000

Regulation and Enforcement

Regulation and enforcement involve State and Federal mandates (NPDES-II regulations, Water Supply Watershed regulations, etc.), erosion and sedimentation control regulations, and a variety of regulations included in the Town's Land Use Management Ordinance and Code that relate directly or indirectly to stormwater management.

NPDES Phase II Compliance - Priority #7: Ensure compliance with Federal and State regulatory mandates.

The Town has prepared and submitted a NPDES Phase II permit application in which it commits to addressing the following six minimum measures: (1) public education, (2) public involvement/participation, (3) illicit discharge detection and elimination, (4) construction site stormwater runoff control, (5) post-construction stormwater management, and (6) pollution prevention/good housekeeping. In addition to implementing a plan to address the above measures, the Town must provide the resources necessary to manage and report on permit compliance and to update the plan as needed.

We believe that the Minimal measures proposed in previous portions of this summary report would generally meet the minimum requirements of the Town's NPDES Phase II permit application with the exception of the reapplication required in year 5. Implementation of more Moderate or Aggressive measures, such as increased enforcement or training resources, would exceed the NPDES Phase II permit requirements in most cases.

Minimal	Moderate	Aggressive
$ 0	$ 20,000	$40,000

Finance and Billing – Priority #1: Develop and implement a comprehensive Stormwater Program Master Plan that supports all of the stormwater program priorities.
- Priority #10: Establish an understanding of the stormwater system as a "utility".

Costs for financial administration and billing services will depend on the final method chosen for managing the billing system. Options include placing the stormwater fee on a local utility bill, on the county tax bill, or establishing an independent billing system solely for the stormwater utility bill. Based on experience with other stormwater programs in North Carolina, billing costs vary from about $40,000 to $80,000 per year, not including costs for additional staff that may be necessary. Ongoing costs will be incurred for updating aerial photography and identification of impervious surface areas upon which the utility rate is established.

Minimal: Establish and implement a basic billing and collections system. Impervious surface area data would be updated continuously and aerial photography would be updated every five (5) years.

**Moderate: Same as Minimal with the addition of an annual independent audit of the Stormwater Management Program financial data; and update of aerial photography every three years.

Aggressive: Same as Moderate with the addition of contract services for collection of delinquent fees; and update of aerial photography every two years.

Minimal	Moderate	Aggressive
$ 60,000	$ 70,000	$110,000

Stormwater Funding Options Analysis

This paper represents the background material utilized during the initial evaluation of funding strategies by the Town that resulted in the recommendation to and endorsement by the Town Council to create a stormwater utility.

Introduction

The stormwater funding options available to the Chapel Hill can be described as "primary" approaches that have the capacity to support the entire program and "secondary" methods that are applicable to special needs or situations but are not capable of funding the full program. The primary funding methods might be used as sole sources of funding for the program, or could be used in combination. The secondary funding methods could be used to augment one or more of the primary funding methods, but are not capable of supporting the entire program.

Primary Funding Methods

- General Fund
- Service Fees
- General Obligation and Revenue Bonding for Capital Improvements

Secondary Funding Methods

- Special Service Fees
- System Development Charges
- Special Assessments
- Impact Fees
- In-lieu-of-Construction Fees
- Developer Extension/latecomer Fees
- Federal and State Grants/Loans

Local governments across the United States have used all the funding mechanisms examined in this report in some manner. 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 are better suited to operations and maintenance, while others are used strictly for capital improvements. Adequate, consistent funding of a stormwater management program is more important to the long-term success of the effort than the source of revenue that is used. The most successful local stormwater management programs are those that have established a dedicated source of funding to support the bulk of the program, especially if that method can be shielded from the shifting priorities of local politics.

Background Information

Standards and limitations exist that influence the viability of various types of funding for certain purposes. It is extremely important to understand the differences between various

types of funding that might be used for the stormwater program. Stormwater funding mechanisms 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), special assessments, exactions, 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.

The intent of a local government in selecting a funding mechanism for a given purpose, and the process it employs to establish it, must comply with the standards for the specific funding concept.

General governmental functions of local governments are usually funded primarily through various "**taxes**" that are simply revenue generating mechanisms. For example, an ad valorem property tax is often imposed upon real (and sometimes personal) property based on its value. Its purpose is simply to provide revenues to defray the expenses of government generally, as distinguished from the expense of a specific function or service. It is not necessary that a tax have a demonstrable association with any particular purpose or function of the local government.

User fees or "charges" that are related to the cost of providing the services and facilities are most often utilized for services such as water, sewer, solid waste, stormwater, gas, electric, development support and park activities. A service fee is imposed on persons or properties for the purpose of recovering the cost of service. This requires that a cost of service study and rate analysis be performed. The general standard applied to utility service fees is that a rate methodology must be fair and reasonable, and resultant charges must bear a substantial relationship to the cost of providing the services and facilities. However, the Town Council has a great deal of latitude in attaining these objectives in the context of local circumstances as they see them. When municipal 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 the result of the decision is illegally discriminatory.

Exactions are 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. In contrast to a tax on property, an exaction (or excise tax) is not based on the assessed value of the property, but is instead associated with or conditioned upon the performance of an act, the engaging in an occupation, or the enjoyment of a privilege. For example, franchise fees on telephone utilities are commonly based on the rationale that telephone wires are run along public rights-of-way.

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. A common requirement of assessments is that there must be a rational linkage 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 front footage along a street or sidewalk improvement.

Legal Characterization

In the course of many proceedings, courts in several states have defined and characterized funding mechanisms in order to distinguish among them. In determining whether a funding mechanism is properly structured and applied within the constraints and/or authority that pertain in a given situation, the courts have carefully considered the nature of the funding mechanism at issue as well as the function involved. In some instances they have also looked to the intent of the local government in adopting the funding mechanism to determine its type.

A funding mechanism intended strictly to raise revenue without specified purpose or application is normally viewed as a tax. In the case of utilities, the courts have held that service fees must be related to the purpose of the utility program (e.g., water supply, electric distribution and generation, wastewater treatment, stormwater management, or solid waste disposal) rather than the governmental function in general. They also have to be dedicated to that purpose.

Historically, utility programs were considered to be proprietary public functions comparable in many ways to a private business activity. There is now a general recognition that most utility programs concurrently also serve a general governmental function of protecting public health, safety, and welfare. As such, they are regulatory programs as well as proprietary functions. In the case of stormwater management, the federal Clean Water Act (Public Law 92-500) and subsequent amendments require that Chapel Hill and many other cities and counties apply for, obtain, and comply with stormwater discharge permits intended to limit the discharge of pollutants to receiving waters. This parallels the impact of the Clean Water Act on local wastewater treatment programs, the federal Safe Drinking Water Act on water supply programs, and the federal Resource Conservation and Recovery Act on solid waste management. In the past all of these functions have been largely a proprietary function of local governments, i.e., one in which cities and counties would be involved as a service provider in a manner comparable to a private business. Now the activities that local governments must perform in each case are dictated to a large degree by the regulatory role that the federal and associated state legislation mandate. The funding of these programs has become largely incidental to the mandated regulatory role rather than the proprietary function itself.

It follows that the funding of most municipal utilities is therefore incidental to a regulatory function and not associated purely with a proprietary activity. Service fees are adopted in response to the programs, with the intent of equitably allocating and recovering the cost of services and facilities, including those of a regulatory nature. This clearly contrasts with taxes, which are considered by the courts to primarily be a revenue generating mechanism supportive of governmental functions and unrelated to specific applications or purposes. Such distinctions make it very important to tie a stormwater utility rate methodology very closely to the purposes of the program that is being funded and to the cost of providing its services and facilities.

In addition, courts in several states have broadened the responsibilities of local governments to encompass greater involvement in solving the problems that may result from their ministerial actions. For many years local governments approved subdivision and commercial development proposals without incurring any specific responsibility or liability for service deficiencies that might result or impacts on nearby properties. In recent years, the courts have begun to make local governments responsible for considering the potential for problems through environmental impact assessments, and for mitigating the

impacts that occur. For example, local governments in several states have been required to improve downstream drainage systems subjected to increased stormwater runoff and resultant flooding and erosion due to subdivision and commercial development approvals they issued. There are parallels in which local governments have been required to provide adequate water supply, wastewater treatment, and solid waste management to meet the needs of developments they have approved.

Analysis of Funding Options

General Fund

The stormwater management program in Chapel Hill has been funded primarily from General Fund allocations with some bond monies for capital improvements. In recent years total spending on direct stormwater management operations and capital investment has been about $725,000 annually. The Town's General Fund clearly has sufficient revenue-generation capacity to support an increase in stormwater management funding, either through a reallocation of current resources or tax increases. Reductions in other services funded from the General Fund to avoid a need for tax increases might or might not be publicly acceptable. General Fund revenues are derived primarily from real and personal property and sales taxes. Other business taxes also accrue to the General Fund.

The demands placed on the stormwater systems that result in needs for operational programs and capital investment in systems and other assets have no relationship to property values or business sales activity levels. They are a function of the peak rate and total amount of stormwater runoff that must be carried safely through the community. However, the revenue sources that support the General Fund are based on a "taxation" philosophy. The purpose of taxes 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.

The greatest inequity in using General Fund appropriations for stormwater management in Chapel Hill is that many public and non-profit properties that place demands on the stormwater systems are exempt from property taxes. As a result they do not participate in funding stormwater management through the General Fund. Even some private properties, for example parking lots and storage warehouses that have large expanses of impervious coverage, do not pay property taxes commensurate with the demands they impose on the stormwater systems. Conversely, some properties that have little impact on stormwater runoff but pay high property taxes are paying more for stormwater management through the General Fund than they would through funding methods based on the demands placed on the stormwater program and systems.

General Fund appropriations for any specific purpose are also highly uncertain from year to year because revenues are not legally dedicated to any specific purpose. Allocations shift with perceived priorities. Stormwater management needs are likely to receive better treatment in the budget in a year following severe storms and drainage problems than in a year following a drought. This makes it difficult to plan and consistently carry out a long-term program plan that depends on reliable funding year after year.

Stormwater Service Fees

In the past, the Town was authorized, but not required, to conduct stormwater management. That has changed over time as more regulations are imposed upon the Town as the operator of the drainage system. This includes both water quantity and water quality mandates. Specific methods of funding stormwater management are not mandated, but the Town is authorized by State Statute to establish a public utility for the purpose of providing a broad range of stormwater programmatic services. Thus, the Town can distribute the cost of stormwater management across the community through service fees deemed appropriate by the Town Council.

Several ways of implementing a service fee funding mechanism are available, most notably the stormwater utility approach. Some communities have integrated their stormwater service fee with other water resource management fees, such as wastewater service fees. In most of those cases independent cost centers and rate methodologies are employed for stormwater and other functions to segregate the funding of various functions.

In most other communities stormwater utility service fee rates have been based on conditions on properties that affect the peak rate of runoff, total volume discharged, and pollutant loadings on receiving waters. The most common stormwater service fee rate structures are based on the amount of impervious area (roofs, paved areas, etc.). Impervious coverage increases the proportion of rainfall that runs off the land. Impervious area service fee rate methodologies are used in more than two hundred other cities and counties. Stormwater rates have also been based on the gross area of properties and a factor that reflects the intensity of development. A few cities and counties have incorporated both gross area and impervious area or the percentage of imperviousness into their rate calculation.

Simplified residential rates are common. Many stormwater service fee methodologies apply a flat-rate charge to all single-family residential properties. Service fee charges to non-residential properties are normally higher than residential charges, reflecting the greater runoff they typically generate. An "equivalent unit" approach is often used to equate service fees on non-residential properties to the rate applied to residences. Monthly single family residential rates typically range between $2.50 and $5.00.

One of the characteristics of a service fee that sets it apart from other funding methods is the ability to enact credits and offsets to the service fees. The authority to adopt credits and offsets is generally encompassed by the basic ratemaking powers provided to locally elected officials. That authority includes the latitude to establish a variety of stormwater utility service fees and rate modifiers such as credits and offsets to achieve what they believe is an equitable allocation of costs. The courts have generally given great deference to locally elected officials in deciding what is appropriate for their communitiy. Courts in several states have also cited the existence of credits as a characteristic of service fees (as distinguished from taxes) in cases where a county or Town stormwater service fee has been challenged.

Credits are frequently included as part of a stormwater service fee rate methodology. Offsets are not. Credits against stormwater service charges are designed to account for the mitigative effect of on-site controls and activities. They are usually predicated on a property owner's continuing compliance with an approved design and operating standards established by the stormwater management agency. Credits may also be given for

activities or functions performed by other entities like local drainage districts or individual property owners that reduce the demands borne by the local government, in this case the Town. Credits usually continue as long as the applicable standards are met or the activities are provided.

In comparison, offsets are one-time, dollar-for-dollar allowances for extraordinary expenses that produce a public benefit. For example, if a developer has installed a stormwater detention system that provides storage capacity in excess of that normally required (and thereby reduces the cost of upstream regional detention or downstream public stormwater conveyance systems), a one-time offset against a service fee might be granted for the additional incremental capital expense of providing excess capacity. Another, perhaps simpler way to accomplish the same objective is for the local government to simply buy excess detention capacity from developers by the cubic foot. Once on-site detention is required and a given amount of detention must be built for a site, the incremental cost of each additional cubic foot of capacity is relatively low.

The revenue generated by a stormwater service fee is a function of the design of the rate structure and the make-up of the community. Based on the experiences of comparable communities, a typical rate structure might be expected to generate between $20 and $40 per gross acre annually for each $1 per month billed to residential properties. Thus, an annual revenue requirement of $100 per acre would likely require a monthly residential service charge between $2 and $5. More detailed analysis is necessary to determine how much revenue would be generated per acre in Chapel Hill under a specific rate methodology.

A stormwater service fee, whether established under a stormwater utility or the existing wastewater utility, could be coordinated or even blended with other funding methods. Revenue from service fees and other types of fees examined in this report (and even allocations of General Fund resources) can be blended to tailor the distribution of costs as the Town Council sees fit. A stormwater utility could have a limited service area, thus excluding undeveloped and lightly developed areas that are impractical to serve initially from the service fee.

Equity of funding can be enhanced through the service fee rate design process. For example, stormwater service fees may be applied to non-taxable (public) as well as privately owned properties. Taxable (private) properties would thus be relieved of a portion of the cost of stormwater management. Adjustments can be made in a rate methodology to account for special circumstances. Credits can be given against stormwater service fees to encourage and reward responsible stormwater management, such as on-site detention of runoff, and to compensate for activities performed by the property owners that are beneficial to the Town's stormwater management program.

The stability of revenue from a stormwater service fee ensures that long-range scheduling of capital improvements and operations can be done with reasonable assurance that funding will be available. This would overcome one of the major problems that currently exist. Dedicated funding that cannot be diverted to other uses also encourages stewardship of the resources.

<u>General Obligation and Revenue Bonding</u>

North Carolina statutes authorize the use of bonding by local governments for capital improvements to infrastructure, including stormwater systems. Bonds are not a revenue source, but simply 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 cost of capital projects, land acquisition, etc.

Two types of bonding are available to cities and counties, revenue bonding and general obligation bonding. General obligation 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. All revenues, including various taxes, may be used to service a general obligation debt. Revenue bonding is supported and ensured solely by revenues such as service fees. Creation of a separate source of revenue that is earmarked specifically for stormwater management (e.g., a stormwater service fee) would allow the Town to sell revenue bonds to pay for capital improvements if market acceptance was attained. However, revenue bonding would not backed by the Town's full faith and credit, and would likely incur a slightly higher interest rate in the bond market. It is also possible to issue general obligation debt that is backed by the full faith and credit but has debt service funded from a designated revenue source like service fees. This is commonly referred to as "double-barreling" of bonds.

Special Service Fees

The Town has been performing special services associated with stormwater management for many years. For example, development projects have been reviewed to ensure that on-site facilities are appropriate. Although there is no specific statutory authority for special service fees for stormwater management plan review and inspections, they could reasonably be included under the scope of a stormwater service fee rate methodology since they are clearly fees for special services.

The rationale for including such fees in a rate methodology is based on the "origin of demand for service" concept, in which costs are apportioned only among those whose needs require the service. Not all "service" provided by a stormwater management program is uniform throughout a community. Some services, such as plan review and inspection, are provided only to a specific clientele. Instead of distributing the cost of such services among all service fee ratepayers, special service fees can be adopted which apply only to the parties who are served.

Fees of this type are often incidental to the performance of specific regulatory activities by the local jurisdiction, functions that are intended to protect the public health, safety, and welfare. Some of the regulatory activities may be mandated by federal and/or state requirements or as conditions of NPDES stormwater discharge or other permits. In other

cases they are simply intended as a cost recovery mechanism that assigns the expense to a specific clientele that is served. For example, special fees might be used to pay for periodic inspections of on-site stormwater systems. Experience has demonstrated that on-site stormwater detention systems tend to deteriorate rapidly after about five years. Maintenance is sometimes deferred, or alterations may be intentionally or unintentionally made to the facilities, compromising their functionality. Annual or biannual inspections may be necessary to ensure that on-site systems are properly cared for and not altered from their approved design. The cost of such inspections can be assigned to the specific property owners through special inspection fees, thus relieving the general service fee ratepayers of that cost of service.

System Development Charges

System development charges are also known as capital recovery charges, capital facilities fees, utility expansion charges, and by other titles. They are not specifically provided for by authorizing legislation in the North Carolina statutes, but are frequently incorporated into stormwater and other service fee rate structures.

These capitalization charges differ from impact fees. They are usually designed to recover a fair share of the previous public investment in excess infrastructure capacity from a developer who makes use of the additional system capacity. In most cases, the excess capacity has been provided in anticipation of development projects subject to the capitalization charge. This is usually a more economical and prudent long-term system development policy than attempting to increase service capacity to meet the demands of growth on a case-by-case basis as it occurs. In contrast, impact fees are intended to maintain adequate service levels in the face of new development.

Special Assessments

For decades capital improvements to stormwater drainage systems in many United States communities were commonly funded through special assessments upon benefited properties. This approach evolved from historic English ditch law concepts originally conceived to pay for drainage of farmlands. The ditch law assessment concept was transferred to the United States from England along with many other local government funding practices. The assessment concept was predicated on allocating drainage costs to the farmers in proportion to the direct and special benefits they individually derived in the form of increased crop yields and grazing use. This led to assessment methodologies that were associated with the value of the enhanced use of the land rather than the demands placed on the drainage systems. In time the ditch law concept was translated into “special assessment district” funding, and was eventually applied to many other capital improvement needs in addition to drainage.

Special assessments are typically used solely for capital projects. In many cases bonds are issued to pay the cost initially, with special assessments being used to pay all or a portion of the debt service on the bonds. Assessments are often levied over a ten to fifteen year period, with the annual payments due and payable along with ad valorem property taxes. Special assessments can also be utilized by enterprise fund accounts to localize the costs of certain capital investments.

Special assessment funding has some inherent short-comings when applied to stormwater drainage systems in an urban setting. These have become increasing evident

in recent years as many cities and counties struggled to correct drainage system deficiencies. The chief drawback of the traditional special assessment methodology is that the distribution of costs must be proportionate with the direct and special benefit accruing to each property being assessed. The benefit must be definable, measurable in some economic manner, and available to the property being assessed within a practical timeframe. General benefits accruing to all properties as a result of a stormwater improvement cannot be used to justify a special assessment, for example better access and mobility along roads that are not frequently flooded.

The emerging "watershed" orientation to water resource management accentuates the limitations associated with special assessments. Increasing local government role in stormwater quality management has further eroded the usefulness of special assessment funding, since it is extremely difficult to demonstrate the direct and special benefit of stormwater quality management to individual properties. The pressure to identify new funding methods has increased as assessments have become less and less suitable for stormwater management programs and projects in recent years, contributing to the emergence of stormwater service fee funding.

State courts have established different standards for service fees versus special assessments, and the standards vary from state to state. Generally speaking, greater latitude is given to local elected officials in setting service fee rates. Special assessments must comply with more restrictive technical standards based on individual benefit. Fully complying with the standards the courts have set for special assessments requires more precise and costly data than is needed to support a service fee, which must simply be fair and reasonable in its general application.

As a result special assessments for drainage are most workable in a very localized application, for example improving a ditch or channel that directly serves a few properties or a relatively small area. Special assessments are less suitable for capital projects that serve a wide area, and are wholly unsuited to facilities providing a general service (or benefit) to the community at large. Because so much of what must be done to effectively manage stormwater quantity and quality in Chapel Hill is not directly and specially beneficial to individual properties, assessments are not workable as the prime source of funding for the stormwater management program priorities identified during this project.

Impact Fees

Impact fees have been associated with a variety of public infrastructure components across the United States. They are often popular with existing residents who wish to see developers pay the entire cost of new capital facilities. Naturally, they are just as often highly unpopular with developers. Specific applications of this type of funding method have been the subject of a great deal of litigation nationally. An unusual aspect of impact fees is that state courts around the country have been notably inconsistent in their definition of them and decisions on their application.

Standards have evolved for adopting and applying such fees and been institutionalized in legislation in several states, though not yet as general legislation in North Carolina. Development sector interests, particularly home builders, have taken the offensive and gained adoption of impact fee laws in several states that impose so many administrative burdens and limitations on use of the fees that they are essentially impractical as a funding source for stormwater system improvements.

Impact fees are typically limited to situations in which the impact of new development on existing infrastructure systems is: 1) measurable and certain; 2) of definable geographic or systemic extent; and 3) quantifiable in terms of the incremental capital investment that will be required to maintain (not attain) an adequate service level. The final point is critically important in terms of stormwater management systems. Impact fees cannot be used to bring an inadequate existing system up to an adequate service level, and thus are not useful in correcting the many problems that currently exist in the stormwater systems in Chapel Hill. Impact fee revenues must also be earmarked for specific projects or uses, must be expended relatively quickly, and, if not spent for the stated purpose, must be returned to the developer.

In-lieu-of-construction Fees

In-lieu-of-construction fees are not specifically authorized by North Carolina statutes, but could conceivably be adopted as one element of a comprehensive stormwater service fee rate methodology. In-lieu-of-construction fees are sometimes confused with impact fees. In-lieu-of-construction fees are typically a substitute for requiring on-site solutions even though an on-site system would work. Impact fees are generally used to pay for off-site measures to compensate for the effects of development that are not solvable on-site. For example, the impact of a shopping center on stormwater runoff could be solved by requiring an on-site detention system or by building an off-site regional facility that is paid for in part through in-lieu-of-construction fees. Shopping center traffic that clogs nearby roads cannot be solved on-site, but an impact fee might be used to pay for additional traffic lanes and/or signalization on the roads for some distance away from the shopping center.

The need for in-lieu-of-construction fees for stormwater management stems from problems local governments have incurred as a result of requiring on-site detention systems on numerous residential subdivisions and commercial properties. Detention systems store stormwater runoff during the peak of a storm event and slowly release it afterward. In some applications they have also been shown to reduce the discharge of pollutants by allowing some settling of suspended solids to take place. However, on-site detention requirements result in small and relatively inefficient systems on private properties. Such systems tend to deteriorate rather quickly and can be easily modified or even eliminated by property owners. A proliferation of small detention facilities quickly creates an inspection and enforcement problem. Fewer large systems serving many properties would be more reliable and efficient, but on-site detention involves a private developer paying for the facility whereas the general public usually pays for regional systems.

An in-lieu-of-construction fee may offer a practical option that would be preferable to both developers and the Town if widespread use of on-site detention systems becomes an element of the long-term stormwater management plan due to regulatory program mandates. Developers would simply pay a fee in-lieu of building an on-site system if off-site impacts on properties immediately downstream could be avoided.

The major advantage of in-lieu-of-construction fees is that the Town (and thus its taxpayers and/or service fee ratepayers) would not solely bear the capital expense for regional detention and other systems to mitigate the runoff impact created by private development projects. Developers would be required to financially participate in solutions

to the impact of their projects, and the long-term regulatory problems of numerous on-site detention systems would be avoided.

The most important disadvantage of in-lieu-of-construction fees is that they rarely generate sufficient revenue to fund construction of regional detention facilities or to enlarge conveyance systems. This dictates that other revenues be used to supplement the fees in order to build regional facilities in a timely manner, so the taxpayers or ratepayers are burdened with the up-front cost. It is also necessary that well-refined capital improvement plans be available from which the cost of the necessary regional improvements can be determined as the basis for setting in-lieu-of-construction fees. The Town does not currently have such a master plan.

Given the lack of a comprehensive master plan, immediate implementation of an in-lieu-of-construction fee is not practical in Chapel Hill. Further consideration of an in-lieu-of-construction fee should be deferred until a capital improvement strategy has been adopted with special planning studies that identify opportunities for substituting regional facilities for on-site detention requirements and detail their anticipated cost.

Developer Extension/Latecomer Fees

Developer extension/latecomer fees are not specifically provided for in North Carolina statutes to fund extensions of stormwater systems, but would appear to be within the broad authority of the Town if adopted as part of a comprehensive stormwater service fee rate structure. They are not a revenue mechanism, but rather a means of properly distributing capital investment costs among several properties when one developer builds a facility with excess capacity to accommodate adjacent or nearby properties that are to be developed subsequently. The most common use of this type of fee around the country is for water and sewer system extensions.

A developer extension/latecomer fee works in the following way. Developer "A" proposes a project that requires a stormwater (or water, or sewer) system with "x" capacity. Practical design considerations indicate that a larger system should be installed to properly serve other nearby properties that are currently undeveloped but likely to use the system when they are developed in the future. Developer "A" therefore is required to build a larger system than necessary simply to serve his or her property, and incurs an additional cost. Property owners subsequently tapping into the improved system when their development occurs are charged a one-time fee by the administering agency for connecting to it, and the fee is then transferred to Developer "A".

This type of fee is supposed to be structured so that Developer "A" and all other property owners ultimately bear a fair proportion of the additional capital cost when all properties are finally built out. The administering agency typically receives no revenue from the fee, although some do charge minor administrative expenses on top of the capital cost that is being distributed by this funding mechanism. This type of fee appears to be practical and feasible for the Town, but only in the future when the capital improvement needs are fully defined for local areas and development standards are adopted requiring provision of excess service capacity as a condition of development approvals.

Federal and State Funding

The Town has all necessary authority to make use of Federal and State government grants and loans that might be available to help support its stormwater management program. The only action needed is for the Town Council to apply for and accept various grants and loans. Federal involvement in stormwater management (other than regulatory programs) is typically limited to advisory assistance, cooperative programs like those provided by the United States Geological Survey and the Federal Emergency Management Agency's emergency response assistance following devastating floods. As investment in watershed planning and capital improvements increases, and as stormwater quality management pursuant to the NPDES permit advances, state and federal agencies may be more practical sources of support for special purposes and projects.

Conclusions

This feasibility assessment indicates that a stormwater service fee offers more flexible, stable, and equitable long-term stormwater management funding for the Town than any other option. Clearly, a service fee has several significant advantages over other funding options. It is highly flexible, offers the prospect of stable funding over time, allows restrictive dedication of the revenues to stormwater management only, and enables elected officials to craft an equitable distribution of costs through a service fee rate design. A service fee rate structure can allocate costs based on the demands placed on the systems and programs instead of property value or other factors unrelated to stormwater service needs. Service fee revenues can be blended with revenues from other sources to enhance both the equity and adequacy of funding.

Regardless of the institutional mechanism employed to implement a service fee, it is the approach that appears to be capable of generating sufficient revenue to meet the program priorities consistently over many years. However, whether a service fee is feasible involves other considerations. A stormwater service fee will be feasible in Chapel Hill only if it: 1) results in a technically equitable allocation of costs that is understandable to the general public; 2) ensures that the revenue is dedicated solely and specifically to stormwater management; and, 3) is packaged and presented to the community in a way that makes sense.

Flexibility is particularly important in Chapel Hill's situation. The stormwater management needs will change dramatically over the next few years, and the ability for funding to change with needs is critically important. A service fee rate methodology can be periodically adjusted in concert with major transitions in programs and priorities. Other funding methods can be blended with a service fee, either as part of a rate structure or independently. Other funding methods differ in their suitability for capital, operating, regulatory, and other types of costs, whereas stormwater service fees can be used for virtually any operating, non-operating, or capital expense. The revenue stream created by a service fee may also allow revenue bonding for major capital investments, enabling the Town to expedite major improvements to the stormwater systems without encumbering its general obligation bonding capacity.

The General Fund, with revenue generated by a variety of taxes and other mechanisms, clearly has sufficient total revenue capacity. However, it must also support numerous other municipal services that do not lend themselves to utility funding, for example police services. Service fee funding could relieve, partially or wholly, the demands stormwater management places on the General Fund, although it may be desirable to retain General Fund support for stormwater management for at least a few years.

Under an enterprise or special revenue fund, a service fee also allows earmarking of revenues strictly for stormwater management, thus improving accountability. Money not spent in one fiscal year carries over into the following year and cannot be diverted to other uses. This encourages stewardship of the financial resources. Chapel Hill already makes extensive use of special revenue funds to isolate expenditures for certain purposes, and enterprise funds exist for the water supply and wastewater treatment systems.

The major disadvantages of a service fee are that it costs money to implement and new fees might be politically unpopular. Political acceptance is more difficult to forecast. Given the extent of commitment to water quality and quality of life issues in Chapel Hill, one might conclude that the community would be receptive to a workable long-term solution. A program and funding strategy that offers a realistic prospect of solutions will have to be communicated convincingly to gain public support.

If the Town chooses to establish a stormwater service fee, it will have to address both institutional and funding issues. One or more ordinances will have to be drafted and adopted. The experiences of other cities and counties suggest that an intensive public information effort should be conducted to explain the stormwater service fee concept to the community.

Rate Base Discussion

Establishing a Rate Base: What service to property generates a user fee?

The "rate base" is defined as those properties that would be charged a stormwater user fee within the Town of Chapel Hill. To establish this rate base, the Town must have a method of identifying who will pay the fees for services. The rate methodology for allocation of cost is the presence of imperviousness as the basis for the fee, utilizing data for cost allocation developed through GIS mapping in the Town.

In general practice and through utility law, the users of the utility service (e.g., water, gas, electric) pay for service on a measurable basis. In the case of stormwater, all property with imperviousness becomes the universe of those who will pay. Modifying factors can be considered, but the initial definition of who will be charged is defined by the presence of imperviousness.

Initially, for the Town of Chapel Hill, the answer of who should pay is all developed properties. (We are not considering who should receive the physical bill each month as that is a decision reached within the functionality of the billing system, such as owner versus occupant). No other factor is being considered for the user fee allocation at this time, so the initial question is answered:

> ***Is impervious area present on the property? If the answer is yes, then the parcel will generate a service fee. If the answer is no, then the parcel will not generate a fee.***

The next question in establishing the rate base is, "Who will be charged the fee?" Here we address how the fee will be levied and often introduce the issues of ability to pay, ownership of the parcel, tax status of the owner and other complexities. It is in this discussion that consideration is given to how Town properties are charged; how all other government entities are treated; whether there is special treatment for the low-income population, etc. We consider these issues as possible "exemptions" to the rate base since all properties with imperviousness are within the initial defined universe of payers.

Exemptions

Exemptions, based on legal precedence and general practice, should be considered based on one of two factors: (1) legally defined exemptions within the State law that authorizes stormwater utilities; or (2) exemptions that should be considered based on the rate method chosen (i.e., should the Town charge for roadway imperviousness). Utility law does not provide for exemptions based on income, tax status or other such factors.

To address equal treatment, fees must be tied to the rate methodology when considering an exemption. A correlation between the rate method (imperviousness) and the financial relief provided to the property owner should be established. Therefore, ability to pay, assistance

for the elderly, non-profit status, non-taxable status and other such socially based issues are not factors for consideration in establishing exemptions. Often where it is important to address these issues, a community will create a separate policy, outside the utility rate analysis, allowing for relief measures to be put in place. (Many utilities work with social agencies or establish their own social program to assist those who cannot pay or provide relief during extreme demand for a utility service such as electric power in a harsh winter).

Two considerations are often given in stormwater utilities for exemptions when using imperviousness as the rate methodology. The first is property that is developed in such a way that it minimizes its impact upon the stormwater program so that the local government's stormwater costs are reduced. Property developed to minimize the need for public services can also be addressed through a credit mechanism within the user-fee system, rather than an exemption. This ensures that the impact-reduction activities are sustained over the life of the system.

The second possible exemption is the roadway network, both publicly owned and privately owned (roadway does not include "driveway" in the definition). Exempting the roadway network from the user-fee is not unusual. It recognizes that the roadway drainage system is an integral part of the stormwater collection system. If the Town chooses to exempt itself from payment of the stormwater fees associated with the roadway system that it owns, it cannot establish a special class of rate payer for itself and not offer the same exemption to like properties.

Recommendations:
The following questions need to be considered: to develop recommendations for modifying the rate base:

1. Should the Town consider any exemptions and on what basis?
2. Should the Town establish a credit policy for those properties that reduce the demand for service (based on the rate methodology)?
3. Should the Town establish any "relief" programs to assist those that may be unable to pay due to financial hardship? This usually entails adding a set-aside to the stormwater program to pay the fees for those that prove they are unable to do so.

Public Education and Involvement

Introduction

The Town of Chapel Hill has established defined priorities for its Stormwater Management Program. Two of these priorities point directly to the need for a coordinated and highly targeted program of public education and involvement:

> ***Develop a formal public education and involvement program targeting key stakeholders.***
>
> *Stormwater education efforts will target key stakeholders, including institutions , development and business communities and the general public. Education efforts will focus on both causes and solutions for stormwater problems, including possible regulatory remedies. Establish a clear understanding that stormwater and surface water systems are a public resource to be protected and managed in the public interest. Involvement strategies may include, among others, stenciling, voluntary litter control programs and adopt-a-stream efforts, etc.*
>
> ***Establish an understanding of the stormwater system as a "utility".***
>
> *It is important that the community have a better understanding of the complexity and importance of the stormwater management system and the comprehensive services that the Town provides to them. Long-term financing with a stable, dedicated resource (as other utilities are funded) will provide the community with a level of service that will meet expectations now and into the future.*

In addition, specific Federal and State regulations impacting water quality require the Town to address public education and involvement in its programs, recognizing the importance of empowering the public to participate in protecting waters of the State. As part of its NPDES Phase II permit compliance strategy, the Town has committed to attainment of specific measurable goals including those related to Public Education and Public Involvement. These goals are to be reached by carrying out defined Best Management Practices (BMPs). Each BMP defines a target audience within the community that should be reached through the Town's education and involvement efforts.

In order to develop a plan for the Public Education and Involvement program, we must first identify: (1) **the phases of the program**, (2) **the "public"** or the relevant target audience, (3) **the message(s)**, and (4) **the media**, i.e. different ways available to the Town to communicate the message to the public.

Phases of the Program

The development of a public understanding of the stormwater program and user-fee is expected to have three phases: buildup, billing day, and the post-billing period.

Buildup is the period of developing and implementing the stormwater management program and funding program. The buildup starts immediately and progresses to within a few weeks of the first bill going out. This period is one of gathering and disseminating data and information, identifying and meeting with certain key stakeholders, educating the press, and forming policy.

Billing Day starts about three weeks before the first bill is sent out and lasts through the first month of billing (seven weeks altogether). It focuses on broad coverage of the reasons for the fees, examples of the effectiveness of the stormwater program and customer service responses to those with inquiries and complaints.

Post Billing begins after the first month of billing and then blends into the long-term public education program concerning stormwater.

The "Public"

The meaning of the term "public" depends on the message being sent, the target audience for that message, and the phase of the program. Target audiences are selected to bring in influential segments of the community at the most opportune time. There are consistent messages for the entire Town (see "The Messages" below). In addition, certain portions of the "public" require special attention at crucial times.

Buildup - The "public" of interest in the earliest buildup phase of the program will include the University, the "Top 50" ratepayers, apartment building owners, the development community, and the churches, i.e. those most notably affected by the new policies. The press will also be a focus of attention during this period. The goal of the message during this phase of the program is to educate and build support ,as well as neutralize opposition, among these various stakeholder groups. Therefore the message highlights, dramatically if possible, the current problems experienced by Town 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 rates and credits. Part of the goal also is to educate ratepayers about the bill they will get in order to minimize the multitude of questions and concerns. It may give special attention to specific ratepayers to avoid pressures on the Council Members from special interest groups or powerful individuals. Attention should also be given to educating Town employees on the user-fee project and the strategies and goals of the organization to meet community needs in stormwater.

Billing Day- The "public" of interest at Billing Day is primarily homeowners and business owners. The message goal here is to educate ratepayers about the first bill they are receiving. The message must be communicated rapidly, often one-on-one, and consistently. There must be a phone line for the public staffed by people who can answer basic questions. There also must be technical personnel who can handle questions about credits, how the rate is applied and the bill amount. Another goal at this time is to demonstrate that the program is active and effective. One way to accomplish this is by having a construction begin on highly visible projects on the first day of billing.

Post Billing- The "public" will be all ratepayers, as well as the development community and the employees of the Town. The post billing period goal is to initiate a longer-term public education and response program. There should be consistent information on policies, a customer service attitude to the responses, and satisfying answers to most questions.

During this period, the messages will concern improvements in infrastructure, flooding, and water quality achieved as a result of the Stormwater Management Program. The general public and Town employees will also be given messages focused on their role in improving water quality through the Best Management Practices defined in the Town's NPDES Phase II compliance strategy.

The Messages

What is it that makes a stormwater enterprise fund and user fee desirable in the first place? It provides a stable and adequate source of revenue to allow the Town to address stormwater management problems and it does so in a way that is fairer than property tax based methods.

The best way to "sell" a stormwater user fee is to stress the goals of the expanded stormwater program and to demonstrate those improvements in service in the first few weeks of the program's life. Care should be taken not to try to sell the program "because EPA is making us do it", "to get more money", or "because the general fund will get a windfall", etc. It is also important not to raise expectations above what can be delivered. More money is NOT the solution if the program itself is not more effective

So, in summary the messages should stress:

- there are needs in the community that are currently not being met (with specific examples that are readily identifiable);
- we have a plan to meet these needs that is well thought out, effective and not extravagant;
- government must take the lead in this;
- this plan costs some more money, but this additional investment is well worth it in terms of solving problems;
- the method to generate this new revenue is fair, adequate and stable, and is more equitable than a tax increase;
- the method is not a tax but a user fee and is very practical in its approach;
- the cost to each homeowner is minimal; and
- there are highly visible projects as a demonstration that the program is a reality.

The Media

Once we have decided on the timing of our message, the target audience for the message, and the content of the message, we can focus on the mechanisms or "media" for conveying the message effectively.

Buildup Phase

Internet Microsite- Perhaps the most useful and cost effective medium for conveying information about the Stormwater Program and funding strategy in Chapel Hill during the Buildup phase is the Town's website, www.townofchapelhill.org. It is recommended that relevant information about stormwater and the Town's funding strategy be gathered into a "microsite" within the current Town domain so that citizens could access all stormwater related material from a single stormwater homepage (i.e. townofchapelhill.org/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.

1. An FAQ about stormwater and the concept of a stormwater utility.
2. The town's NPDES Phase II application and comprehensive Stormwater Management Program.
3. The Stormwater Impact Statement and Stormwater Management Plan Guidelines (already on the Town site under the Engineering Department)
4. Some explanation of the Town's current efforts to create funding equity through user fees;
5. The Stormwater Microsite should include a mailto: address to a Town employee who could respond to citizen questions. These questions could also be added over time to the FAQ.

As additional information becomes available, it could be 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 Chapel Hill.

The cost of operating the Stormwater Microsite would be negligible in terms of hardware and software, since the Town 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 Creation - This involves the actions necessary to differentiate the stormwater service from other services. The actions taken in this regard depend on the Town's decisions on how far they want to take this differentiation. It may involve letterhead, vehicle decals and uniforms, department status, etc. A decision on any symbols used to represent the Stormwater Program should be made early so that there will be time to establish the identity in public awareness before Billing Day. 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.

News Articles - Some news organizations allow, and even appreciate, the Town providing newsy pieces about the program. They are not normally accounts of events but rather

interesting stories about challenges in addressing flooded areas, the need for a new funding method, etc.

Testimonials – Testimonials (e.g. Mia Burrough's project) 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. The "articulate housewife" is the secret weapon when standing before a recalcitrant developer group, commission or other homeowner group.

Stakeholder Meetings - In these meetings it is important to demonstrate recognition of opinion leaders' positions and influence, listen to their concerns, if possible solicit their support, and respond quickly to questions that cannot be answered on the spot. Such meetings should include representatives of the major ratepayers, churches, University, 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.

Billing Day

Informational Brochure(s) - These brochures are designed to give a simple explanation of the program, why it is necessary, and what it 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 (one general one, one to answer questions on billing, one on how to get a complaint fixed, 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 Chapel Hill given the focus of the program on the construction of numerous smaller capital and remedial maintenance projects. This brochure should be matched with a planned and prepared set of capital improvements which would be previously contracted and 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 are currently scheduled for production in Year 2 of the Town's NPDES Phase II Program. In addition, fact sheets for public distribution are planned in Year 3 for education regarding Illicit Discharge issues. It may be advisable to accelerate these BMPs in order to contribute to the education effort for the new user fees. The cost of producing and distributing quality brochures or flyers for the Utility would overlap with the Town's Phase II efforts.

Bill Stuffer- If a bill stuffer is to be used, the first one will communicate the overall change in stormwater management, what programs are being initiated, and the priority of the effort. It will tell people that a bill will be sent in the future to pay for the program, and will provide 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 next month's bill will include the stormwater management user fee. This technique will have to be carefully coordinated with OWASA, if they are the billing agent.

Customer Service - The mailing of a stormwater bill will generate some complaints and inquiries to the sender of the bill and to the Town. 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 a few months of billing). But many of the calls will need to be handled by Town personnel either due to the complexity of the call or the importance of the caller

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 Town employees.

Post-billing

School Programs- A long term program for educating school children about Stormwater would be a cost effective way to build permanent community support for efforts to improve water quality. Such a program is also effective 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 Town. Such a program is currently scheduled for Year 3 of the Town's NPDES Phase II program but could be accelerated.

In-house communication- The Town could use training programs for employees and the internal newsletter (The Communicator) to target messages about Stormwater. This is currently planned in Year 1 of the NPDES Phase II program. At least one such training session and/or employee newsletter should occur prior to sending the first bill.

Involvement

Stormwater Policy Review Committee - Chapel Hill has already instituted a Stormwater Policy Review Committee. Their meetings will generate additional public and media interest in the comprehensive stormwater management program. Information and handouts will be presented to the stakeholders and made available to the media. The press might interview individual stakeholders; special efforts to prepare them will help keep the message consistent.

As some of the most knowledgeable citizens on the issue of Stormwater, the Stormwater Policy Review Committee should be enlisted to help in the effort to explain the role of the Utility and to help convince the community that the Stormwater user-fee approach is the most stable and equitable funding source available.

Elected Officials- The elected political leadership constitutes a specific group of stakeholders – perhaps the most important group in terms of approval of the comprehensive stormwater management program. The Council Members must be treated with special attention during the development of the program and its policies.

The Press- The news media can be a great ally in Chapel Hill. When the media are educated and informed early, they are generally supportive of stormwater agencies and the utilization of user fees. The news media should be notified of important meetings and granted interviews when requested.

NC Big Sweep- The Town of Chapel Hill plans to participate in and promote the existing NC Big Sweep activities. This constitutes a Year 1 Public Involvement activity in the NPDES Phase II program.

Illicit discharges and connections- The Town plans to incorporate an illicit discharge detection public involvement program in its website beginning in Year 4 of the NPDES Phase II program. This will encourage residents to report observed discharges, illegal connections to the Stormwater system, and illegal dumping.

Deliverables

The Town will receive from AMEC Earth and Environmental the following products related to the Public Education and Involvement Program:

1. **Assistance with formulating content for the Stormwater Microsite.**
2. **Examples of logos, symbols, and other mechanisms for creating a distinct identity for the Stormwater Program.**
3. **Review of articles or news stories prepared for submission to local newspapers to garner publicity for the Stormwater Program.**
4. **One slide/script presentation for use in stakeholder meetings and community presentations.**
5. **Camera-ready art for two bill stuffers for use at Billing Day (if appropriate).**
6. **One Stormwater brochure/flyer for use in general distribution.**

Other elements of the introduction of the new program and fee structure, such as Customer Service assistance, is part of the utility implementation plan and is not considered in this proposal.

SCHEDULE OF ACTIVITIES – INTRODUCTION OF STORMWATER MANAGEMENT PROGRAM

	2003		2004	First Billing ↓		2005
Activity / *Quarter*	4	1	2	3	4	1
Develop tools for public information program		■				
Construct Stormwater Microsite	■					
Develop brochures and flyers			■			
Develop contacts among stakeholder groups	■	■				
Develop list of speaking opportunities		■				
Meet with large ratepayers, institutions			■			
Develop slide presentation		■				
Seek media coverage		■	■	■	■	■
Public Informational meeting(s)		■	■			
User-fee kick-off events				■		
Customer Service Hotline				■	■	
Continuation of public information activities					■	■

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.

Current Program Organization and Costs - Introduction

In order to understand and assess the current and future needs of the stormwater program in Chapel Hill, a review of the current stormwater-related activities, by division and by function was conducted. The following report summarizes the findings that resulted from staff interviews and review of pertinent financial and operational documents.

Once the current program elements were identified, as estimate of costs associated with these elements was developed. Based on a rough estimate of time various employees spent on stormwater-related activities, a percentage of operational expenses, and the cost for capital improvements, it was estimated that Engineering, Public Works, and Inspections invested a total of over $1M annually on stormwater related activities. These generic costs were further evaluated to determine which costs could be identified as strictly stormwater management costs (ie. clean-up of hazardous wastes, though it has a water quality component, is not directly related to stormwater management and these costs were removed from the totals).

The Committee considered which costs should be transferred to the stormwater utility as existing costs. It was recommended that the following cost categories be included: funding of stormwater staff in Engineering; funding of field crews and equipment from Public Works; water quality testing and monitoring programs; the drainage assistance program; capital improvement resources; inspections costs related to stormwater compliance and best management practices; and funding for acquisitions related to the stormwater conservation program. This resulted in a recommendation that approximately $800,000 be transferred from the general fund to the utility during the first year of implementation.

Current Program Organization and Costs

This report summarizes current Staff responsibilities and current costs related to stormwater management in the Town of Chapel Hill. The information presented was compiled from interviews with Town Staff, written reports submitted by the Staff, and existing Town documents. These interviews were conducted by AMEC staff beginning in late May and ending in mid-June, 2003. Fourteen (14) departments were interviewed and provided data and operational insight into the Town's current stormwater activities. These Departments include: Engineering, Planning, Public Works, Inspections, Finance, Information Technology, Library, Police, Fire, Housing, Transportation, Human Resources, Parks & Recreation, Town Manager and Town Attorney.

INTRODUCTION

The primary management functions of the Town's stormwater program are the responsibility of the Engineering and the Public Works Departments with significant additional activities conducted in Inspections, and with support from other departments as appropriate. The Engineering Department reviews construction plans for compliance with Town design standards and policies and is responsible for administration and enforcement of regulations related to the Resource Conservation District. The Engineering Department works closely with Orange County staff regarding enforcement of soil erosion and sedimentation regulations. Moreover, the Engineering Department is charged with development of a community-wide Stormwater Management Program to provide comprehensive stormwater services.

The Public Works Department maintains and repairs the drainage system on Town-owned rights-of-way (ROW) and property, sweeps streets, and provides internal services for Town buildings and vehicles. The majority of stormwater resources in terms of funding and personnel are housed in Public Works. Engineering and Public Works cooperate closely to resolve stormwater complaints and related issues.

The Inspections Department conducts building inspections and enforces applicable sections of the Town Code of Ordinances.

The Town's jurisdictional limits include portions of both Orange and Durham Counties, with the majority of the Town lying within Orange County. Orange County conducts permitting, inspections and enforcement for the Town's Erosion and Sediment Control program Orange County also operates recycling programs in the Town. The University of North Carolina at Chapel Hill lies within the Town's jurisdictional area and is applying for its own separate NPDES Phase II stormwater permit. At the present time, the University is not required by the Department of Environment and Natural Resources (DENR) to have its own permit, and the priorities of DENR in issuing permits are unknown.

The North Carolina Department of Transportation (NCDOT) is responsible for operation and maintenance of storm drainage within its rights-of-way within the Town.

ORGANIZATION

In addition to the Town Manager's Office and the Town Attorney's Office, the Town of Chapel Hill has fourteen (14) departments, each with specific responsibilities to serve the Town's needs. A number of departments have direct responsibility for stormwater-related activities and other departments offer support functions that contribute to the Town's stormwater program. The Town's organization structure is shown in Figure 1.

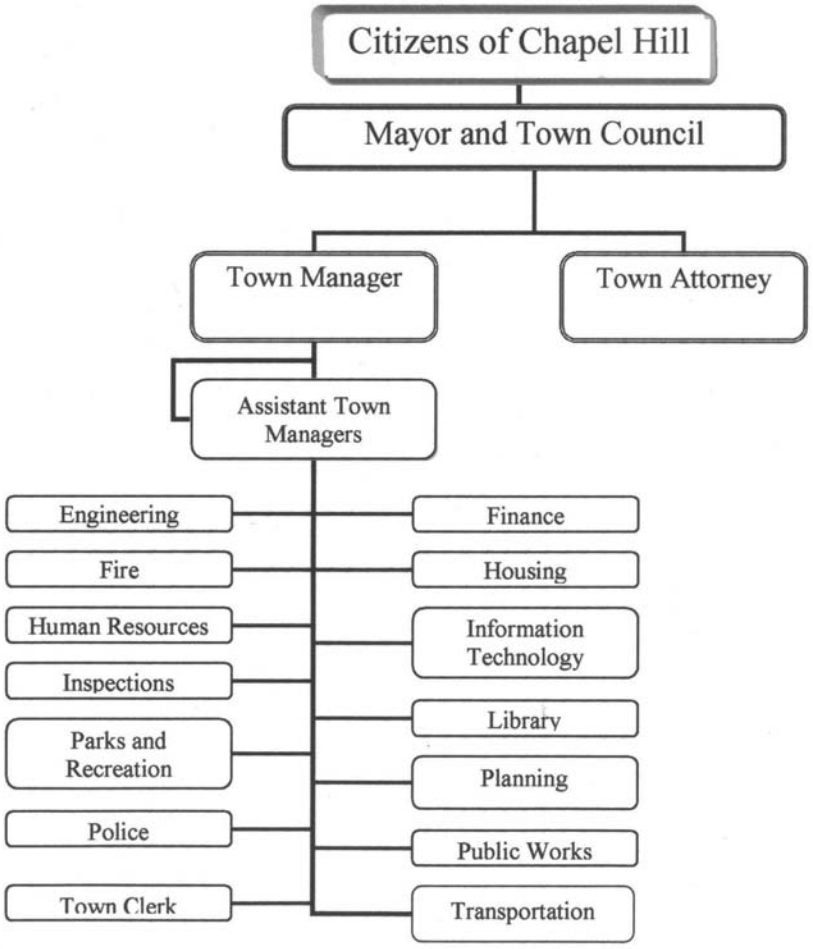


Figure 1. Chapel Hill Organizational

The staff assignments for the three departments that perform a majority of the stormwater management services within the Town are summarized below:

Engineering:

- Engineering Director
- Administrative Assistant
- Stormwater Management Engineer
- Traffic Engineer
- Engineering Coordinator
- Surveyor/Project Coordinator
- Engineering Design Specialist
- Senior Engineering Inspector
- Engineering Inspector
- GIS Technician
- Engineering Technician (3)
- Interns/contract employees

Public Works:

- Director
- Field Operations Superintendent
- Landscape Operations Superintendent
- Internal Services Superintendent
- Solid Waste Services Superintendent
- Drainage Maintenance Supervisor

- Streets Supervisor
- Construction Supervisor
- Streets Crew Supervisor
- Streets Inspector
- Street Cleaning and Construction Crew Supervisor
- Construction Workers (20)
- 87 other staff

Inspections:

- Director
- Assistant Director
- Permits Technician
- Inspectors (5)
- Code Enforcement Officers (2)
- Administrative Clerk

Support for these three departments comes from several other Town Departments; most notably the Planning Department, the Finance Department, and the Offices of the Town Manager and Town Clerk.

EXISTING STORMWATER MANAGEMENT PROGRAM

Comprehensive stormwater management programs address a broad range of services provided to the community and can be defined by the following nine functional categories of services. The Town of Chapel Hill currently performs many of these operations; however, in some cases these functions are handled by other entities (ie. Orange County) or are not part of their current programs.

1) **Administration**, including Program Planning & Development
2) **Special Programs**, including Public Awareness and Involvement; GIS, Mapping and Database Management; Special Program Planning & Development
3) **Billing and Finance** including billing operations, customer service, financial management, capital outlay
4) **Indirect Cost Allocation** including overhead costs, cost controls, and support services
5) **Stormwater Quality Management**, including Water Quality Master Planning; Retrofitting Program; Comprehensive Monitoring Program, BMP Programs and Activities, Pesticides, Herbicides and Fertilizer; Used Oil & Toxic Materials; Street Maintenance Program; Spill Response and Clean Up; Septic and Pipe Leakage; Illicit or Cross Connection Detection; Illegal Dumping; Landfills and Other Waste Facilities
6) **Engineering & Planning** including Design Criteria, Standards and Guidance, Field Data Collection; Hazard Mitigation; Plan Review, and Zoning support,
7) **Operations**, including General Maintenance Management; Emergency Response Maintenance; and Complaint Investigation and Response
8) **Regulation and Enforcement** including General Code Development and Code Enforcement; Drainage System Inspection & Regulation; Flood Insurance Program; Multi-Objective Floodplain Management; Erosion Control Program
9) **Capital Improvements** including Major Capital Improvements, Minor Capital Improvements, Land, Easement, and Right-of-Way Acquisition

The Town's stormwater management program consists of many intertwining operations that

function together to meet the Town's stormwater needs. These operations, while housed in various departments, have been defined in terms of the nine (9) functional categories defined above. A summary of the stormwater operations in the Town of Chapel Hill along with the associated departments' and agencies' responsibilities and functions is outlined below. It is important to understand that the departmental functions and responsibilities summarized are only a part of what these departments do for the Town.

ADMINISTRATION

Offices of Town Manager and Town Clerk:

- Reviews and recommends to the Council operating and capital improvement budgets
- Facilitates preparation of Town's Comprehensive Plan
- Fields and refers citizen complaints, and processes petitions and zoning issues related to stormwater (25% of petitions deal with stormwater issues).

Public Works:

- Handles administrative activities associated with on-going operation of the system

Engineering:

- Handles administrative activities associated with new development (application review)
- Leads in the development of the long-term utility-based stormwater management program
- Administers Resource Conservation District (determination, database, development review)
- Administers National Flood Insurance Program

Inspections:

- Participates in Plan Review Process including determination of location in or near theResource Conservation District or floodplain.
- Administers Building Inspections including issues related to stormwater runoff.

SPECIAL PROGRAMS

Administration:

- There are several special programs applicable to stormwater. Within the Town Administration, the citizen petition process is used to involve the public and address citizen concerns. The Clerk's Office prepares agendas for public meetings and places newspaper ads to give notice of meetings.

Engineering:

- Participates in a portion of the Town's open space land acquisition program for purchase of property. This may include both the Hazard Mitigation Program and the program for Stormwater Conservation Areas.
- Conducts in-house coordination for the Big Sweep program in Orange County.
- Oversees the regional aerial photography program.
- Manages the Drainage Assistance Program.
- Manages the Town GIS coverage.
- Provides technical assistance to other staff and citizens.

Public Works:

- Handles the bulk of citizen phone calls requesting drainage assistance.
- Installs new manhole covers, which carry a stormwater message.
- Conducts Drainage Assistance Program labor and materials/supply installations.

Planning:

- Provides Staff support for advisory committees
- Develops the Comprehensive Plan

Information Technology:

- Manages the Town's intranet/internet services.
- Works with other departments to utilize GIS.

Fire:

- Permits underground tanks
- Administers and conducts hazardous materials and vehicle accident cleanup

BILLING AND FINANCE/INDIRECT COST ALLOCATION

Finance:

- Administers the Town's $38.4 million budget
- Manages internal funds, grants, and purchasing
- Represents the Town to OWASA
- Responsible for billing for solid waste
- Collects fees

Engineering:

- Manages Hazard Mitigation grant program
- Manages the Stormwater Conservation Areas program

Planning:

- Develops initiatives for the Bond Program

STORMWATER QUALITY MANAGEMENT

Public Works:

- Operates the street sweeping program. Operators (2) sweep the streets year round.
- Runs the litter control programs
- Conducts yard waste collection and leaf collection

Engineering:

- Conducts design and Stormwater Impact statement review for new development applications.
- Conducts technical review for compliance with Water Supply Watershed rules
- Maintains the Town's Design Manual

- Assists with regulation enforcement and performs stream delineation for the Resource Conservation District.
- Conducts water quality sampling
- Conducts site visits and performs technical assistance for sedimentation and erosion control and other stream health issues.

Fire:

- Responds to flooding/water related incidents
- Provides initial response to petroleum/hazardous material spills.
- Conducts vehicle accident cleanup

Orange County:

- Operates a recycling program including used oil
- Conducts Household Hazardous Waste Collection Day
- Administers Town Sedimentation and Erosion Control ordinance.

ENGINEERING & PLANNING

Engineering:

- Maintains and updates the Town's Design Manual which includes construction specifications, design standards, and construction details
- Performs technical review for in-house, capital improvement, and cost share projects.
- Performs plan review or design for stormwater control measures required by ordinance or policy.
- Develops and maintains local Hazard Mitigation program
- Conducts the water quality testing program
- Coordinates watershed issues regionally.
- Manages Drainage Assistance Program.
- Manages Stormwater Utility development.

Planning:

- Supports planning for the Bond program.
- Conducts Comprehensive planning
- Administers development permit program.

OPERATIONS

Public Works:

- Receives and investigates stormwater complaints. Works with Engineering when necessary to address the drainage problem.
- Controls vegetation within the Town right-of-way.
- Runs leaf collection program
- Maintains Town-owned drainage system
    - Three man ditch crew maintains storm drainage ditches throughout the entire Town

- Cleans catch basins, storm sewers, and culverts with assistance from construction and streets units of Operations Division.
- Relocates beavers, as necessary
- Collects litter and debris and conducts special event clean-up
- Constructs drainage and curb and gutter
- Performs maintenance of Wallace Parking Plaza green roof, building maintenance, and monitoring of pool water discharge. (Internal Services Division)

Engineering:

- Receives and investigates stormwater complaints. Coordinates with Public Works when necessary to address drainage problems.

North Carolina Department of Transportation:

- Receives and responds to complaints on State roads
- Maintains road drainage system within NCDOT right-of-way.

REGULATIONS AND ENFORCEMENT

Engineering:

- Technical assistance for regulations of Resource Conservation District
- Provide technical support to Inspections Department for enforcement
- Reviews and approves plans and performs supporting calculations for new construction and redevelopment.
- Reviews all components of site work including water, sewer, roadway, grading, erosion control, and stormwater to ensure compliance with the Zoning and Subdivision Ordinances, LUMO, Design Standards and Specifications and Policies.
- Performs technical review for compliance with Water Supply Watershed rules.
- Review for floodplain administration.
- Performs construction site inspections related to:
  - erosion control measures, silt fence, etc.
  - water lines, sewer lines, storm sewers and associated appurtenances, installation and testing,
  - street and parking layout, grading, compaction, and pavement,
  - stormwater detention facility layout, grading, compaction, and general construction,
  - establishment of vegetation.

Inspections:

- Enforce regulations of the Resource Conservation District.

Planning:

- Reviews and approves plans for new construction and redevelopment.
  - Reviews for compliance with the Floodplain Ordinance
  - Reviews for compliance with the Water Supply Watershed Ordinance.
  - Reviews for compliance with Zoning and Subdivision Ordinances
  - Reviews for compliance with LUMO

- Preparation of the comprehensive plan.
- Issues development permits.

Offices of Town Manager and Town Clerk:

- Prepares and reviews modifications to Town code (LUMO, soil erosion ordinance, stormwater utility)
- Organizes Public Hearings related to regulation

CAPITAL IMPROVEMENTS

Offices of Town Manager and Town Clerk:

- Administers Capital Improvement Program.

Public Works:

- Identifies stormwater capital improvement projects.
- Performs some of the minor capital improvement projects.

Engineering:

- Identifies stormwater capital improvement projects.
- Designs minor stormwater capital improvement projects.
- Administers the design and construction contracts for those projects performed using outside resources.

Reference Documents:

Planning for Chapel Hill's Future: The Comprehensive Plan, May 2000

This plan considers in some detail the issues of urban growth with emphasis on the topics of housing, transportation, regional planning, environmental issues, and University relations. Strong emphasis is placed on the Growth Management Protocol and the preservation of the Urban Services/Rural Buffer Boundary.

Town Development Ordinance, Article 5

This document establishes an overlay district for the Town and specifically creates the Resource Conservation Districts for critical parcels in low-lying areas and near streams.

Capital Improvements Program (CIP)

The Town operates under both a 5-year CIP plan ending in FY 2005 and a 15-year CIP plan ending in FY 2016. Each plan establishes a clear system for program prioritization and a list of planned expenditures. These expenditures include funds from the 1996 Bond Fund for drainage projects and drainage assistance through 2003 and funds from the CIP Fund for drainage assistance through 2016.

Manual of Specifications, Standards and Design, April 1982 (updated periodically)

Town of Chapel Hill Administrative Policy: Stormwater Drainage Discharge, February 14, 2000.

Town of Chapel Hill Administrative Policy: Storm Drainage Improvement Policy, March 23, 1998

Town Budgets 2002-2004

Town Code of Chapel Hill

The Town Code contains Ordinances and Regulations for all activities within the Town's jurisdictional limits. The following chapters have an affect on stormwater runoff:

- Chapter 17, Soil and Erosion and Sedimentation Control
- Floodplain Regulations, Floodplain Protection Zoning Overlay
- Water Supply Watershed Protection, Appendix A Subdivision and Appendix B Zoning
- Town Code - Appendix B, Zoning Regulations
- Town Code, Appendix A, Subdivision Regulations

Cost of Service and Rate Analysis

Section 1 - Introduction

1.1 Purpose

This project is intended to identify program structure for a five-year planning period in support of a change in funding strategy for stormwater through the use of a utility or user-fee based revenue generator. In the summer of 2002, the Town Council authorized the Town Manager to proceed with the development of policy and program for stormwater management utility implementation. The use of a utility for long-term financing of regulatory and operational needs to support the drainage infrastructure and compliance with water quality mandates and initiatives is occurring throughout the state of North Carolina, with the first major user-fee supported program implemented in the early 1990's in Charlotte.

This report consolidates several products of a thorough analysis of the Town of Chapel Hill's stormwater management needs, strategic options, and funding opportunities. It focuses on the scope of needed stormwater management services and facilities, the magnitude of associated costs, the funding options available to the Town, and the structure of service fees that could be used to support an effective program. A five-year period is addressed, termed the "analysis period".

This report is drawn from, references to, and includes information from, other studies, analyses, and investigations performed by the AMEC consulting team and by the Town over the past decade including the involvement of citizen-based committees. It reflects a process of due diligence that ensures that the Town has accounted for all key considerations in formulating its stormwater management program and crafting a practical and effective funding strategy. It is sufficient to support adoption, by the Town Council, of a municipal stormwater utility rate methodology and service fee rates acting pursuant to the authority and powers provided in North Carolina statutes and Town Charter.

1.2 Compelling Need for a Funding Solution

Inadequate funding has been a major impediment to attaining solutions for the Town's drainage problems and water quality challenges for many years. The stormwater program costs have not been fully captured and clearly delineated in budgets, with program direction divided among various operating departments such as Public Works, Engineering and Planning. Funding has been primarily through appropriations from the Town's General Fund. Infrastructure improvement needs have been identified by the Town staff, but have largely gone unmet for lack of consistent funding.

Drainage and water quality are long-term, pervasive, community-wide issues that cannot be solved by localized measures or a one-time infusion of funds. We believe there is a compelling need to provide better stormwater management services Town wide. To do so, the Town must either increase revenues from current sources or adopt others to supplement and supplant them.

1.3 Process

A solution to the current funding quandary rests first on defining an effective stormwater program and then determining if one or more viable funding methods exist to support it. An iterative process has been employed, including the following steps.

- The general nature of stormwater problems and needs in the Town were evaluated through interviews with staff, review of the past decade of work by staff and citizen committees and by some general field investigations.

- Numerous meetings and interviews were held with Town staff to assess the current status of stormwater management activities and associated funding, and identify future needs. Operational, regulatory, infrastructure management and water quality functions were identified that together constitute the framework of a comprehensive approach.

- A Policy Review Committee, composed of Town citizens with varied interests and concerns was convened. The committee met with the project team eight times to discuss key stormwater management policies for stormwater program development and to address key policies for fee allocation and billing. Cornerstone issues were identified and discussed with the committee. Their policy guidance on the program strategy was incorporated into the analysis contained in this report.

- The general scope of capital improvement needs is limited due to the lack of Master Plans and supporting basin models that should drive the Capital Improvement Program for the Town. Capital improvements have been identified by staff from complaints received from citizens and from their knowledge of long-standing problem areas within the Town.

- Program components appropriate to the problems and needs were identified, and a strategy was developed for growing an effective program. The key components include operations and maintenance, regulation and enforcement, engineering and master planning, capital improvements, water quality, administration and finance.

- Nearly a dozen funding mechanisms and revenue sources were evaluated in the initial phase of work completed in 2002 and summarized in the Business Plan presented to the Town Council in the summer of 2002. At that time the various methods were screened for suitability, including various taxes, service fees, and other funding mechanisms.

- Databases and data processing resources were evaluated to determine their usefulness in implementing various stormwater funding mechanisms and a recommended strategy was presented to the Town for consideration. These included use of the Orange Water and Sewer Authority billing system, Orange County Tax billing system, third-party billing systems and internal billing capabilities.

1.4 Contents

In addition to this introductory section, the report contains the following.

- Activation of service fees requires a ***Rate Structure Analysis***, which identifies and evaluates methods of apportioning the cost of services and facilities. Five basic rate concepts were examined, seven modifying factors that might be used to fine-tune the basic rate concepts were identified, and ways of orchestrating the service fee rates and other funding mechanisms were evaluated. A preferred rate parameter, impervious area, is recommended. Appropriate rate modifiers and other funding mechanisms are also proposed.

- The ***Cost of Service Analysis*** section projects the estimated operating, non-operating, and capital expenses of the proposed program strategy. Costs are projected for the five-year analysis period. Significant enhancements in the operational program and several remedial capital projects can be accomplished in that period. However, it should be stressed that the stormwater program is expected to extend indefinitely to ensure that the Town's drainage systems are improved, maintained, and operate properly and that water quality is protected.

- The ***Rate Study*** section describes the rate base available to support stormwater management through service fees in Chapel Hill, and presents pro forma cash flow analyses of two scenarios for the planning analysis period.

1.5 Uncertainties Impacting this Analysis

This report presents a reasonable, order-of-magnitude projection of the costs and service fee rates needed to meet both operational needs and capital expenditures during the first five years of a comprehensive program. However, it should be stressed that uncertainties exist that may impact this analysis and the success of the proposed strategy, including the following.

- The Town's NPDES Phase II permit will be issued for a five-year period under "temporary" rules issued by the State. Final rules could impact the program structure as projected within the analysis.

- The NPDES permit is subject to review and renewal near the end of the analysis period. The conditions of the renewed NPDES permit could significantly influence costs in the last year of the analysis period.

- Blending of several funding sources has become more common in recent years. The opportunity to use other funding mechanisms may alter the costs to be recovered through service fees. For example, the Town Council might decide to adopt service fees and/or might opt to use bonding for infrastructure projects rather than a pay-as-you-go approach. The funding projected for Capital Projects can support the payment of bonded debt rather than cash-fund improvement projects.

- Significant informational gaps exist. For example, the Town has a known backlog of approximately $650,000 in capital project needs. It is recommended that an aggressive strategy be followed in completing Master Plans on the major watershed with sub-basin models and plans completed toward the end of the analysis period. These will add to the

list of needs. Master plans should address not only systems where hydraulic capacity needs are known or are a priority but should be integrated with water quality protection initiatives so that a comprehensive prioritization process can be developed to support all community objectives.

- Our experience elsewhere suggests that capitalization of smaller systems could involve substantial costs. The development community may bear some of that expense as they build new subdivisions and commercial projects, but the amount is uncertain. It is important that upon completion of the major watershed studies that sub-basin analysis occur to assist in objective development review and strategies for the Town.

- The Town's role in stormwater management is likely to broaden, may extend into different functions and responsibilities, and may include elements of the natural drainage systems that are not presently subject to Town control, management, and operation. It is exceedingly difficult to manage an extensive physical "system" by dealing with only a portion of the components, which suggests that the Town will expand the systemic extent of the drainage facilities it actively manages.

- Annexations of unincorporated areas may occur, which could alter priorities and increase the capital and operating needs and costs.

- Routine maintenance and remedial repair needs increase as drainage systems age, but the age profile and rate of deterioration of the existing drainage infrastructure in Chapel Hill is not fully known at this time. Thus, increases in operational workload can only be estimated based on our experience in similar settings. Master Planning should address analysis of current system conditions as part of the prioritization strategy for capital improvements.

- Federal and state regulatory requirements will likely increase, especially those associated with water quality. Total Maximum Daily Load (TMDL) limitations on discharges to receiving waters could impose even more demanding and costly stormwater management responsibilities and practices on the Town than the current NPDES permit. Revised floodplain mapping and federal regulations may impact the Town's drainage infrastructure capitalization and operating needs. For example, the Federal Emergency Management Agency has recently mandated that local and state hazard mitigation plans be adopted in order to be qualified for assistance in the event of an emergency. It is implied that adoption will result in the funding and implementation of hazard mitigation strategies within the Plan for each community.

- The visibility of stormwater management and the community's service expectations are likely to increase if the Town Council adopts the recommended funding service fee. Higher service levels almost always result in higher costs.

In light of these uncertainties, the program strategy, cost and rate projections in this report could be subject to change as additional information is gathered and processed and the Town Council makes key policy decisions. If the Town Council decides to proceed with establishing a user-fee ordinance, further refinement of the program strategy, priorities, funding mechanisms, costs, and rates will follow from time to time as the program evolves. A routine rate review is recommended to ensure that the stormwater program maintains sufficient, adequate and stable funding.

1.6 The Character and Scope of Stormwater Management

The Town of Chapel Hill staff and Town Council have recognized for several years that its stormwater management capability is not sufficient to correct existing drainage problems or prevent future ones from developing. However, the many dimensions and magnitude of the challenges of managing stormwater may not be fully grasped by the community at-large.

- The threat of flooding is a primary dimension of stormwater management. Most people think of drainage service in those terms. The general perception in Chapel Hill appears to be that the impacts of flooding are localized, neighborhood concerns. Thunderstorms create neighborhood flooding and erosion along streams, ditches and channels. Some may even pose personal safety hazards to citizens or property when streams surge out of their primary channels and flood homes, yards, and roads.

- Federal floodplain management and water quality mandates comprise a second dimension of the stormwater management challenge. The Town operates in an environment dictated in part by the requirements and restrictions contained in federal and state laws, which may prevail over local customs or priorities. They principally impact the Town's land use regulations, development standards, and operational activities. Some things the Town must do are not based on service demands initiated by local citizens and businesses, and may even be resisted by some.

- The aging of the existing stormwater infrastructure is a key third dimension of the challenge facing Chapel Hill. The on-going infrastructure management aspect of stormwater management is often misunderstood and underestimated. Chapel Hill contains several small watersheds where drainage is provided by natural streams, ditches, and improved channel systems that are visible to the general public but not necessarily perceived as "public systems". The remainder of the drainage system is out-of-sight in underground storm sewers, inlets, and other structures. Much of the infrastructure was installed fifty years ago or more, and is approaching the end of its useful physical life. Experiences in other communities indicate that the failure rate of storm sewers, inlets, and other drainage infrastructure increases markedly when structural components reach two-thirds to three-quarters of their useful lives. Given the pattern of development and age profile of the Town's infrastructure generally, it is likely that a substantial portion of the drainage systems will need remedial repair (if not replacement) in the next two decades.

1.7 "Building Block" Program Development Approach

This analysis is predicated on a program development strategy that emerged from the consultant's investigations, with input from the Town staff and the Policy Review Committee. Stormwater management has become a complex municipal business involving water quality as well as quantity control. It requires sophisticated engineering, diverse operational functions, and a substantial investment in infrastructure. A "building block" approach is recommended by the consultant team as the most practical way to upgrade the current stormwater management efforts over time.

The recommended strategy is intended to implement a comprehensive, long-range program in a series of logical steps that optimize the balance of investment in capital facilities, replacement of

aging systems, maintenance of existing infrastructure, and regulation of private development impacts on stormwater runoff and the drainage systems. Water quality functions are accorded equal importance with flood protection and erosion control.

Establishing adequate and equitable funding is an immediate priority in the strategy. Concurrently, the Town should expedite attainment of visible improvements in day-to-day service levels and construction of infrastructure so the community sees results. Improved routine maintenance and remedial repair of aging systems are clearly needed. Public information is vitally important in educating the community about stormwater management and gaining support for the enhanced program and its expense.

The building block approach also addresses activities that go on behind the scenes. An inventory of the major drainage systems has been assembled in support of the master planning analysis. This is a valuable resource and has potential applications to maintenance and regulatory programs as well as capital project planning and construction. For example, pursuant to it NPDES permit, the Town must identify and periodically inspect all significant stormwater discharge points. A system inventory provides a framework for such information. Assembly of the physical inventory points out a gap in the Town's support resources. A comparable "access inventory" is also needed which identifies existing easements, rights-of-way, rights-of-entry and other access provisions. Such rights enable (or limit) the Town's ability to build, maintain, operate, and regulate the drainage systems. An access inventory integrated with the system inventory would provide improved command and control of operational activities and support for design and construction. Additional support systems and resources will also be needed. For example, a geographical information system (GIS) can be a powerful tool in both assembling and applying data to the day-to-day program. Investment in maintaining and enhancing such support systems will pay off for years to come in the form of more effective, less costly operations and maintenance and fewer problems during and following storm events.

The proposed strategy recognizes that the scope of the Town's program must be substantially broadened if the existing problems are to be addressed and future ones avoided. It also emphasizes the importance of properly orchestrating the assembly of the program "building blocks" into a cohesive, understandable package. The timing of various program elements is carefully considered in projecting the costs of service. The investment in planning is an emphasis of the first five-years, resulting in a growth in capital projects and remedial repairs. Chapel Hill's ability to optimize its routine maintenance, remedial repair and replacement, water quality, and capital improvement programs will be constrained by the need to finalize plans, so that must be expedited to support program growth.

External influences are also accounted for in the building block approach. The Town's stormwater management responsibilities are now defined in part by the federal Clean Water Act[1] and its NPDES permit. The Town does not have an option in regard to the NPDES permit. It must comply in a timely manner or face possible sanctions, even including the potential loss of federal funds for transportation and other programs and substantial fines by federal and/or state agencies for non-compliance. The program strategy and cost analysis recognize this mandate and provide for greater emphasis on stormwater quality through compliance with the permit.

1.8 Program Development Priorities

[1] Public Law 92-500, The Clean Water Act, as amended by the 1987 Water Quality Act.

The type and amount of stormwater management costs projected in this report are driven by the work program priorities of the five-year analysis period. Priorities were frequently reviewed and discussed with the Town staff and the Policy Review Committee as strategic options were being crafted. Three different citizen-based committees studied the issues of stormwater in the Town from 1992 to present. The priorities established by these various committees were presented to the Policy Review Committee over the past year and they were charged with validating those previously identified issues of concern.

1.8.1. Develop and implement a comprehensive Stormwater Program Master Plan that supports all of the stormwater program priorities.

A Stormwater Master Plan will be developed based on the Mission and Program Priorities for the stormwater management program. It will set out the activities to be undertaken in line with the priorities and a time schedule and resources needed to accomplish the various elements of the stormwater management program. The Stormwater Master Plan will help guide the implementation of the stormwater management program over the long-term.

1.8.2. Address stormwater quantity (flooding) as an integral component within the program.

The stormwater management program will be enhanced to include comprehensive long-range management efforts to minimize flood risks and the many effects of flooding. These efforts include prioritizing and addressing stormwater infrastructure needs such as maintenance, repair, replacement, upgrades and capital improvements.

1.8.3. Address stormwater quality as an integral function within the program.

The stormwater management program will continue to address stormwater *quality.* This applies to water quality regulatory demands, as well as to erosion and sediment controls and to stream and aquatic system health. The stormwater management program will recognize and move toward the goals of the Town's Year 2000 Comprehensive Plan.

1.8.4. Protect and restore natural stream corridors.

The health of the aquatic ecosystem is dependent on both quality and quantity management. The Town's stormwater management program will address both infrastructure concerns and aquatic habitat health.

1.8.5. Develop a formal public education and involvement program.

Stormwater education efforts will identify key stakeholders, including institutions, development and business communities, and the general public. Education efforts will focus on both causes and solutions for stormwater problems, including possible regulatory remedies. The goal will be to establish a clear understanding that stormwater and surface water systems are a public resource to be protected and managed in the public interest.

1.8.6. Define the level of service and performance standards for the Town's Stormwater Program.

The stormwater management program will plan, prioritize, design and construct system improvements at a pre-determined level-of-service that is considered to be appropriate for public and private drainage systems. Defining the level and extent of service and

performance for the Town's drainage system provides valuable guidance about how and where stormwater management is to be delivered and enforced.

1.8.7. Ensure compliance with Federal and State regulatory mandates.

The stormwater management program will implement reasonable regulatory programs that comply with stormwater quality mandates from Federal and State, agencies, and will address floodplain management requirements.

1.8.8. Establish clear stormwater program leadership that the public recognizes.

The stormwater management program will clearly identify point(s) of contact responsible for system planning, regulatory compliance and enforcement, system design, construction and maintenance, and addressing stormwater concerns from the public.

1.8.9. Integrate programs to utilize resources efficiently.

The stormwater management program will minimize duplication and inefficiencies in the management and implementation of the various stormwater elements in order to improve the overall cost-effectiveness of the program and to optimize the use of already scarce resources. It will promote integrated programs and inter-jurisdictional cooperation aimed at ensuring a positive public reception to the program.

1.8.10. Establish an understanding of the stormwater system as a "utility".

The stormwater management program will be funded, at least in part, by the creation of a utility, providing a stable, dedicated funding source like those already in place for other services (i.e. water, sewer, gas, electricity)

1.9. Conclusion

There may be significant changes in existing operational activities and shifts in cost allocations as a result of the formation of the utility. Resources will be dedicated on a consistent basis allowing for long-range planning and program implementation with certainty of service delivery. This provides the staff with the ability to define goals that will drive programs implemented over several budget cycles with assurance that the program can be effectively and efficiently delivered to the public.

It is estimated that a fully preventive level of routine maintenance will require at least five to eight years to achieve, and perhaps a decade or more. The current backlog of remedial repairs is not fully known and, when combined with those that will emerge as the drainage systems continue to age, could require ten years or more to resolve. It should be anticipated that the backlog of needs may increase significantly when the systems are fully planned and capital improvement master plans are finalized. Simply extrapolating from the experiences of similar cities, it is not unrealistic to think that the backlog of remedial needs alone might approach several million dollars.

Section 2 - Rate Structure Analysis

2.1 Purpose

Several ways of structuring and calculating stormwater service fees (or "user charges") are employed by cities and counties throughout the United States. This section of the report summarizes several rate methodology options available to Chapel Hill. The basic parameters employed for rate structures, plus modifying factors that can be applied to the various methodologies, are described. Other funding methods that can be blended with fees are identified.

The initially preferred rate structure and mix of funding may have to be adjusted as needs change over time. Information will flow from the capital improvement master planning in the future that may suggests that substantial capital investment is needed in the drainage systems. More remedial repairs and capital improvement needs may be identified as the master plan is implemented and existing systems continue to age. Stormwater quality management may become an even more demanding part of the program as the Town's NPDES permit is implemented and renewed. Fortunately, the stormwater utility approach provides excellent flexibility to adjust as the needs evolve, including changes in the program, funding demands, and rate concepts.

2.2 Evaluation Criteria

The consultant team's experiences 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. Every community is different and needs a solution that fits its specific situation. Beyond circumstances unique to Chapel Hill or the North Carolina Statutes, the following criteria were applied during the development of the Business Plan and during implementation discussions for the utility:

- attainment of equity in the apportionment of costs;
- the balance of rates with level of service;
- data requirements;
- 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.

None of the service charge rate structures or secondary funding methods examined during the preparation of the Business Plan or the final policy development 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.

2.3 Framework of Rate Structure Components

The stormwater rate methodologies, rate modifiers, and other funding methods identified in this report provided a menu of options to the Town. Basic rate structure concepts are the foundation of a service fee. Modifying factors (such as flat-rate charges for single-family residences and base rates for fixed costs per account) enable a basic rate methodology to be fine-tuned. Finally, 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.

2.4 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. Thus, the costs incurred by the Town in providing the program 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.

Five rate structure options are examined in this report. After review, we have concluded that two are better suited than the others for use in Chapel Hill and were included in the initial recommendation for implementation of the utility. Seven modification factors are also examined. Several secondary funding methods are integrated in the funding strategy.

Similar rate structures and associated funding concepts are used in more than five hundred other communities across the United States that have established stormwater management utilities, districts, and similar entities. Direct comparisons with rate methodologies, modifications, and secondary funding methods used elsewhere are not appropriate, however, since the approaches examined in this study must be viewed in the specific context of the needs, priorities, and local circumstances in Chapel Hill.

Examples of service fees resulting from various rate methodologies are provided in this report. They compare charges to typical residential and non-residential properties under different methodologies, but are only illustrative. The example fees are only generally representative and typical of what has occurred elsewhere when the various rate methodologies have been applied. They clarify how cost apportionment is influenced by the rate structures. The actual charges to residential and non-residential properties in Chapel Hill might differ from the example values cited in this report, depending on the revenue requirement of the program and the design of the rate methodology. The figures cited in the examples should not be viewed as specific values that would result from the selection of any of the rate options in Chapel Hill.

The basic rate methodologies examined were:

- impervious area;
- impervious area and the percentage of imperviousness;
- a combination of impervious area and gross area;

- gross property area and the intensity of development; and,
- gross area and several modifying factors.

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

- a simplified single-family residential rate;
- 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, eight other funding methods or sources of funding were examined during the development of the Business Plan in 2002,. Most would be used only in special situations or be applied to limited clientele groups. For example, the Town Council might wish to institute special service charges for stormwater-related services not generally provided to all properties or for limited geographical areas that receive higher than standard levels of service. Secondary funding methods or sources evaluated were:

- General Fund appropriations
- Special assessments
- Bonding for capital improvements
- In-lieu of construction fees
- System development charges
- Impact fees
- Developer extension/latecomer fees
- Federal and state funding opportunities

Except for General Fund appropriations 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. Several of these could be incorporated directly into a service charge rate structure rather than established separately. Once Master Plans are completed, the Town will have sufficient data to implement several of these supplemental funding sources.

2.5 Basic Rate Methodologies

2.5.1 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 paving and rooftops. Large expanses of roofs and paving 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.

Most 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 100, 500, or 1,000 square foot ranges of impervious area are used. These are commonly referred to as "range" values.

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 product 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.

The following example illustrates how service fees based on impervious area might be calculated. Assume that a typical single-family residential property is determined to have 2,000 square feet of impervious area. If a monthly charge of $.001 (i.e., one-tenth of a cent) per square foot of impervious coverage is used, the typical residence would be charged $2 per month, or $24 per year. If a flat-rate fee is applied to all single-family residences, a range value equal to the impervious area of the typical single-family residence might be used. Terms like "equivalent residential unit", "equivalent runoff unit" and "equivalent service unit" are commonly used. Other cities and counties have opted to use various equivalent unit values as part of impervious area rate methodologies, ranging from less than 1,500 square feet to more than 3,000.

Comparing charges to dissimilar properties is easy when an equivalent unit value is used. For example, under the above assumptions a commercial or other non-residential property with 20,000 square feet of impervious coverage (about one-half acre) might be charged $ 20.00 per month. A very large WalMart® or Home Depot® development or a shopping center with twenty acres of impervious area (approximately 870,000 square feet) might be billed about $870.00 per month. However, as these figures suggest, each of the example properties cited would be charged the same per square foot of impervious coverage.

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. Additional administrative systems would be needed to support a system development charge.

The correlation between stormwater fees and the type and level of service provided would not be influenced to a great degree by the rate methodology used. Only limited data is currently available on the cost of different levels of service that might be provided in the urban and rural areas. Lacking more data, it is difficult to consciously balance the initial stormwater service fees with the level of service provided to certain areas or individual properties in Chapel Hill. An impervious area rate methodology is suitable for incorporating the level of service into a rate methodology through a modification factor if and when such data becomes available.

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, the Town 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 as much as seventy (70) percent for long-term maintenance of data regardless of the type of rate methodology employed. A two-tier or three-tier simplified rate structure for residences similar to those used in Cincinnati, Ohio, Charlotte, North Carolina, Boulder, Colorado, and Tacoma, Washington require maintenance of impervious data on all the residential housing stock as well as non-single family residential properties.

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. The compatibility of an impervious area rate methodology with the Town's existing data processing systems would appear to present few problems. The issue of how to bill for stormwater management is yet to be fully resolved but the consultant team and staff considered use of the OWASA billing system as well as Orange County tax bills as primary methods. It is recommended that the Orange County Tax bill mechanism be utilized at this time.

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. Approaches based on subjective parameters like intensity of development (which is often coupled with gross area) allow substantially more engineering judgment to be applied, both in the design of the rate methodology and in its application to specific properties. An impervious area rate structure can accommodate other funding methods based on the same parameter, such as system

development charges applied to new developments to recover deferred participation in capital investment costs.

2.5.2 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, 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 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.

This rate concept would require that both gross area and impervious area data be gathered. Generating data for two parameters rather than a single parameter would cost an estimated $1 to $6 per account. Incorporating a simplified charge for single-family residences could significantly reduce the number of properties requiring specific data, perhaps by as much as seventy (70) percent. Future maintenance of the data for developing properties could be accomplished by requiring that gross area and impervious area data be supplied to the Town 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.

2.5.3 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. A few use both parameters to derive percentages, ratios, or other figures, which are then used in rate calculations.

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 the community's perceptions. Based only on the coefficients of runoff used in hydrologic engineering, gross to impervious area ratios in a service fee calculation ranging from as low as 1:4 to as high as 1:40 might be defensible in a given situation. 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 tends to allocate more of the cost burden to lightly developed and undeveloped properties than methodologies 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. A gross area/intensity of

development methodology does not directly incorporated impervious area in the calculation, and is likely to shift costs toward lightly developed and undeveloped properties.

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 $2 per month. The charge for the gross area of the property (8,000/100*$.05 = $4/year) would be added the charge for the impervious coverage (2,000/100*$1 = $20/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. A gross area/impervious area rate methodology might conceivably allow undeveloped properties to be charged, but this would be contrary to the mandated exemptions contained in Section 402.053.

The balance of charges with the level of service would be reasonably good under this approach. However, as cited previously in the assessment of the impervious area methodology, the limited amount of data currently available on the cost of service and the disparate levels of service presently provided in different parts of the Town make it difficult at the outset to create a high degree of specific correlation between the fees and the costs. This would improve significantly as the program is refined in the next few years. The details of this type of rate structure would almost certainly have to be adjusted as the stormwater management program matures over the years.

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. Cost of the master account file might range from $1 to $6 per unit. 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. System development charges and other secondary funding methods could be based directly on one or more of the parameters used in this type of rate structure.

2.5.4 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 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. To the best of our knowledge, 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.

Using the example properties previously cited in this report, if this methodology resulted in a $2/month residential service fee ($24/year), the 30,000 square foot commercial property would be charged $18/month or $216 per year. The example of an 870,000 square foot shopping center property assigned an intensity of development factor of .90 would be charged $783/month, or $9,396/year. This approach could allow service charges to undeveloped as well developed properties.

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. That is why many of the jurisdictions use a phrase like "intensity of development factor" rather than the engineering term "coefficient of runoff".

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 Town 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.

2.5.5 Gross Area (or Impervious Area) and Modifying Factors

A rate methodology could be based on either gross area or impervious area with two or more modifying factors. The purpose of the modifiers would be to refine how the rate structure treats certain conditions on individual sites that are secondary influences on the quantity and quality of stormwater runoff. Gross area could serve as the primary parameter, but the calculation would have to include impervious coverage or the percentage of imperviousness in some manner. Using impervious area as the primary parameter would implicitly exclude undeveloped properties. Numerous modifying factors might be used in this type of methodology, including but not limited to a peak runoff factor (perhaps based on impervious area, soil and slope conditions), a water quality impact factor, and a level of service factor.

A service fee calculation under this type of rate methodology might begin with a base charge of $.10 per month for every 8,000 square feet of gross area on a property. Various modifying factors might then be applied to increase or decrease the service charge. This approach offers tremendous flexibility. For example, a peak runoff impact factor based on imperviousness could be used to quantify the impact of development conditions and land use. The numerical factor for peak runoff might range from 1.0 to 20.0 or higher. Additional factors for such considerations as water quality impacts and level of service demands might also be multiplied times the basic charge per 8,000 square feet of gross area. Some factors, such as on-site detention, might result in a reduction of the service fee rather than an increase. This could be accomplished by using a value less than unity (1.0) in the formula.

The precise design of an algorithm and range of the various rate factors would have to be determined through a detailed analysis of service costs and the degree to which each factor influences them. This could result in a very complex rate algorithm that would be difficult to explain to the general public. For example, a single-family residential property in the core of the Town might be subject to a basic charge of $.10/month, plus a runoff factor of 9.0 ($.90/month), plus a water quality factor of 5.0 ($.50/month), plus a level of service factor of 5.0 ($.50/month) reflecting the cost of a highly structural stormwater system (as opposed to open ditches), resulting in a total fee of $2/month. A similar property in an outlying area might be subject to the same basic charge, runoff factor, and water quality factor, but have a lower level of service factor (say, 1), and thus have a total service fee of $1.60/month instead of $2.00/month.

The calculation of fees for non-residential properties might be even more complex if factors such as the handling and use of potentially polluting materials on the site and off-site vehicle traffic generation demands were considered. Because of the complexities it is not possible to offer a clear comparison of the service fees that might result for example non-residential properties as projected for the other rate methodology options.

The data management requirements of this type of rate structure also pose a major obstacle. First, the factors to be used in a rate algorithm would have to be determined and validated. Present engineering practices reflect general agreement on the impact that some factors have on runoff quantity and quality, but (as the variations in hydrologic models reveal) the state of the art certainly does not suggest that a consensus exists. Even if a consensus was available and calibration values were generally accepted, it would be an onerous task to assemble a complete and accurate database for applying this type of methodology. Possible parameters include soil conditions, the average water quality impacts and/or pollutant loadings of various land uses, and the mitigative influence of on-site detention, grass swales, or porous pavement.

The cost of initial production and maintenance of such data would be very high for each parcel when compared to the cost of other methods. It would be difficult to justify given the rather

moderate service charges that are typical of stormwater management programs. Furthermore, this approach would be so refined as to present a substantial case for a differential rather than simplified fee structure for single-family residences. This might create pressures to assemble discrete data for each residential property, greatly increasing implementation and upkeep costs. Depending on the number of factors used in the rate algorithm, the accuracy requirements imposed on the data, and whether a simplified residential rate would be appropriate, the cost of initial data gathering could easily exceed $20 per account. When compared with the expense of the other options (roughly $.25 to $6 per account), this cost would be difficult to justify on the basis of marginal increases in equity or a slightly better balance between charges and the cost of service.

This approach could have far greater data processing requirements and thus impact data systems more than other options. Depending on the number of parameters used, the nature of the data, and the design of the rate algorithm, this type of rate structure might demand two to three times as much file storage capacity as other options. It might also require more complicated programming. Additional costs related to processing requirements, on-going management needs, and data storage impacts would be incurred. Since many of the conditions used in rate calculations would be subject to alteration, updating the data could dictate that a separate master file be created even if the charges were delivered on an existing billing.

The stability of revenue generated through this approach would be comparable to that of other options, since the level of the charges would probably make it uneconomical for property owners to institute physical changes that would take advantage of the values in a complex rate algorithm. Gross area clearly could not be altered in terms of the total rate base (loss from one account would always be equaled by an offsetting gain to another), and the influence of individual factors would likely be relatively minor.

The most evident advantage of this approach is the greater flexibility it allows in the design of the rate algorithm and its application to individual properties or classes of customers. The rate formula would be more complicated than under other rate structures, with more opportunities to make minor adjustments and incorporate a variety of credit and added-charge mechanisms based on detailed data. However, the type of flexibility enhancements most feasible for this type of rate concept would introduce even greater costs for data gathering and long-term maintenance, with only minor improvements in overall flexibility compared to other rate options. All things considered, this type of rate structure appears too complicated, costly, and difficult to calibrate and verify to be feasible at this time. While the concept is a desirable extension of the current state of the art, it is neither realistic nor justifiable presently.

2.6 Modifying Factors

A total of seven modifying factors were considered during the rate methodology analysis in developing the Business Plan and in this rate analysis and recommendation. 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;
- 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.

2.6.1 Simplified Single-family Residential Service Fees

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). Communities presently using simplified residential flat rates include: High Point, Wilmington, Rocky Mount, Cumberland County, Winston Salem, Gastonia and Greensboro. A few cities use two or more tiers of flat-rate charges, segregating mobile homes, small-lot residential, large-lot residential, etc. These include Charlotte/Mecklenburg, Greenville and recently proposed rates for Raleigh. Only a few communities use purely discrete charges for each residential property based on the same parameter applied to non-residential properties.

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 may reduce by 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 (typically anywhere from $2 to $6 per account) can be cut by 50 % or more simply by grouping residential properties in a single class or a few tiers. The cost reduction attainable through a simplified residential charge is greatest when a multi-parameter rate methodology is used.

Two alternatives were evaluated in the process of rate analysis. One would categorize all single-family residential and duplex properties into one rate category using 3015 square feet of imperviousness based on analysis of these properties. The second would classify each single family and duplex property into one of three categories, based on increments of 2000 square feet of imperviousness (i.e., 0 – 2000; 2001 to 4000 and over 4000 square feet of imperviousness). The Town has data available to distinguish the amount of imperviousness on each property sufficiently detailed to provide a high degree of confidence in the classification of the property into the correct category which is critically important in the process of rate analysis.

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.

A sampling of the single-family residential housing stock in Chapel Hill suggests a single flat-rate charge for residences would not diminish the overall level of equity of a service fee. Given the age and state of the drainage infrastructure in many older neighborhoods that predominately have small lots, the cost of service in those areas may be higher than in the more recently developed areas with larger lots, newer infrastructure, and more open drainage channels.

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 Policy Review Committee there was a high interest in distinguishing between smaller impervious single family residential (SFR) properties and the significant number of single family residential properties with over 4000 square feet of imperviousness (based on 2002 data, there are less than 1100 SFR properties under 2000 square feet and more than 1700 SFr properties with greater than 4001 square feet of imperviousness). Because the data is available to make this determination and assignment of classification, it is recommended that the Town utilize a three-tier rate for SFR properties.

2.6.2 Base Rate for Certain Uniform Fixed Costs

Chapel Hill'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, weather monitoring, 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" is often charged to every account. It is generally a more equitable allocation of such costs apportioning them based on parameters like impervious area. 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. The net increase in residential charges is typically between seventy (70) percent and ninety (90) percent of the amount of the base rate component of the total service charge, not one hundred (100) percent. Thus, if the expense of billing, administration, overhead and other fixed costs per account are $180,000 per

year and are distributed among 15,000 accounts, each account would pay a base rate charge of $12.00 per year ($1.00/month).

This type of modifier is more advantageous for a large commercial property that has many equivalent units than it is detrimental 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 equivalent residential unit. Since they would pay the same additional charge for base rate costs, but less on each equivalent unit, their net change would be an overall decrease in fees. The amount of the 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 should be negligible. Residential rates would increase, and the charges to very large and/or heavily developed properties would decline minimally (depending on the rate parameters employed). The impact of such a shift needs to be carefully considered if the residential service fee is near the ceiling of the community's willingness-to-pay envelope without a base rate charge.

2.6.3 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 Chapel Hill. A portion of the community's prior investment in stormwater management facilities has been made with Town-wide financial support. The remainder was built by developers or other public agencies. They typically either retain and manage the improvements as public facilities (for example, highway drainage systems) or contribute the infrastructure to the Town, which then assumes management.

Stormwater improvements funded by the Town 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 Town 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.

A floodplain surcharge is not sensitive to external influences, and does not diminish the revenue stability of a basic rate structure, regardless of whether it is based on impervious area, gross area, or some combination of parameters. There is virtually nothing that a property owner could do to remove a property from the floodplain, although flood-proofing may be a practical option for some structures. This type of surcharge is relatively flexible, and the amount and its application to individual properties could be easily adjusted based on new technical information.

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.

This type of modifying factor would probably cost between $1 and $3 per account to implement over and above the normal expense of developing a master account file. Maintenance of the data would be limited to updating the basin specific charges so they are consistent with changes in the cost of capital improvements.

The compatibility of this concept with existing capital funding policies in Chapel Hill 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 Town-wide significance.

2.6.4 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. That 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 thirty-three (33) percent and seventy-five (75) percent in recognition of on-site control that reduces runoff rates.

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 Chapel Hill 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 Town'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 Town'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.

2.6.5 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 Town costs associated with water quality impacts to those properties having the greatest influence on the need for pollutant control services and systems.

The Water Quality Act of 1987, amending the Clean Water Act on 1972, requires that NPDES stormwater discharge permits be issued by the United States Environmental Protection Agency. The North Carolina Department of Environment and Natural Resources (DENR) has received delegation of primacy to administer such permits and regulate pollutant discharges to receiving waters from stormwater outfalls. The Town has recently submitted an application for compliance with the temporary Phase II regulations on NPDES and a renewal will have to be negotiated with DENR within the analysis period.

With this mandated addition of water quality to traditional stormwater control functions in mind, several cities and counties have adopted or are considering modifications to their stormwater service fee rate methodologies to better account for water quality impacts. In the converse to the stormwater quality credit mechanism, a water quality factor might be adopted that increases the service fees applicable to properties that either discharge greater amounts of pollution in stormwater runoff or have the potential of doing so if certain controls are not instituted and maintained.

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 (the percentage of impervious coverage) 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.

2.6.6 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.

2.6.7 Level of Service Factor

Stormwater service levels vary across Chapel Hill. Although the Town'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. In the interim, the Town may wish to consider a level of service factor that would reflect the status of services and facilities in certain areas relative to the Town's service objectives in general. 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 Town is providing a minimal level of day-to-day service in most of the urban area. Deficiencies are most commonly exhibited in the form of localized flooding during moderate storm events. The Town has not consciously adopted specific levels of service on a geographical basis.

The greatest obstacles to implementing a level of service modifying factor are that the Town 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. For example, if a property is exposed to minor damage due to flooding during a two-year storm event when the service objective is a twenty five-year event, how might that be reflected in a modification factor which reduces the service charge to reflect the actual service level?

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. The master plan now underway will begin to define flow capacity

service level objectives, which might reasonably range from a two-year level to a one hundred-year level depending on risk exposures. 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.

Section 3 - Cost of Service Analysis

3.1 Overview

Over the past year, the consultant team and staff have completed an analysis of programs necessary to augment current resources that would, in the long term, address the priorities identified in Section 1 above. Key to development of the rate recommendation is an analysis of costs of service to provide the resources needed to meet these objectives. This analysis is a "resource" evaluation and not a budget exercise. Upon adoption of the user-fee revenue system, the Town will continue to budget resources annually, based on the program of services targeted and the total resources available in each budget year.

The five-year analysis period provides sufficient predictability to determine the ability of the Town to take on new initiatives and the degree to which any one of the priorities can be addressed or services established to begin addressing these long-term goals. Projected costs are needed in order to determine the necessary level of service fees, and also to determine the revenue requirements of other funding mechanisms. A full range of stormwater management costs are identified in this report. A recommended cost of service for the five-year analysis period is presented.

3.2 Cost Analysis Methodology and Format

A "cost of service analysis" serves a different purpose, is performed for different reasons, and must meet different standards than the Town's annual budgeting process. Cost analyses are performed to determine revenue needs. Budgets are prepared to facilitate elected officials' oversight of local government financial management, give order to the process of preparing and adopting annual budgets, and support on-going accounting and management control.

The Town's annual budgets are prepared in a format that complies with North Carolina Statutes, administrative rules, and generally accepted accounting practices and standards for government entities. Cost analyses are not structured to conform to those guides, but rather to satisfy due diligence standards underlying rate-making decisions by the Town Council.

The distinction between budgets and cost of service analyses is important. Cost of service analyses are intended to support rate-making decisions rather than budgeting decisions. Similar information must be considered in cost analyses and annual budgeting, but service fee rate-making decisions should not be done in the budgeting process without the benefit of appropriate cost and rate analyses that establish a rationale nexus (link) between the two. Cost analyses may support assigning certain costs to other forms of funding (e.g., general fund appropriations, or special assessments) in support of budget decisions, but are not specifically oriented to the budgeting process.

3.2.1 Cost Centers

The costs and other financial information in a cost of service analysis are organized differently than comparable data in the Town's annual budget. Costs are organized by "program centers", rather than by organizational units or accounting funds as in the budgeting process. The following program centers were used in this analysis.

- **Administration, Finance and Billing**
  - General Stormwater Program Administration
  - Billing, Finance and Customer Services
  - Legal Support Services
  - Personnel Services
  - Administrative Support Services
  - Program Planning and Development
  - Inter-agency Coordination
  - Public Education Programs – General
  - Indirect Cost Allocations
  - Unspecified Overhead
  - Cost and Rate Analysis
  - Emergency/disaster Management

- **Engineering, Modeling and Planning**
  - Stormwater Quantity Master Planning
  - System/project Design Engineering
  - Maintenance and Field Engineering Support
  - GIS, Database, and Mapping
  - Technical Services/Public Assistance
  - Best Management Practice Analysis/Design
  - Design Criteria and Design Manual
  - Field Data Collection
  - Hazard Mitigation Planning
  - Code Development and Zoning Support Services
  - Multi-use Planning and Design
  - Flood Insurance and Community Rating System
  - Infrastructure Management Planning

- **Operations**
  - Maintenance Management
  - Customer Service
  - Storm Sewer and Culvert Maintenance
  - Remedial Repair and Replacement
  - Inlet, Catch Basin, and Manhole Cleaning
  - Erosion and Sediment Control
  - Detention/retention System Maintenance
  - Ditch, Channel, and Stream Corridor Maintenance
  - Curb and Gutter Maintenance
  - Infrastructure Management Program
  - Public Assistance Program
  - Emergency Response

- **Regulation and Enforcement**
  - Code Development and Enforcement
  - Stormwater Permit Administration
  - Drainage System Inspection and Regulation
  - Zoning and Land Use Regulation Support
  - Special Inspection Programs

Dumping Regulation Program
Floodplain Management
Erosion/Sediment Control Regulation

- **Capital Improvements**
  Major Capital Projects
  Small Capital Projects
  Land, Easement, and Rights Acquisition
  Equipment

- **Water Quality**
  Stormwater Quality Master Planning
  NPDES Administration and Reporting
  Watershed Assessment
  Water Quality Monitoring
  Best Management Practices Development
  Water Quality Retrofitting Program
  Installation of BMPs
  Illicit Connections and Illegal Dumping Program
  General Commercial/Residential Program
  Pesticide, Herbicide, and Fertilizer Program
  Toxic and Hazardous Materials Control Program
  Spill Response and Cleanup Program
  Industrial Runoff Control Program
  Public Education Program
  Groundwater and Drinking Water Program
  Septic, Inflow, and Infiltration Program
  Emergency Response
  Habitat Assessment

3.2.2 Expense Categories

Four expense categories are designated under each major cost center in this report: Personnel (salaries and wages), Supplies (commodities), Services (contractual), and Capital Expenses (capital purchases and capital construction). These categories correspond to the major categories in the chart of accounts for expenditures used by the Town in its budgeting and accounting systems. Using these categories in the cost analysis will make translating the cost of service information to the Town's budget format easier.

Personnel costs assigned to the stormwater program in our analysis are limited to the direct salaries and wages of staff that will be managing the program as well as carrying out or overseeing the engineering, planning and water quality protection services to the community. The costs of these positions include the direct benefits and overhead that support the salaries of personnel throughout the Town organization. After reviewing the current program, which is dispersed among several departments, we concluded that a focused management and technical team are needed. We propose a team of eight full-time positions that would be direct salaried positions funded under the utility account. The positions might be titled Stormwater Services Program Manager, Stormwater Development Services Engineer, Water Quality Technician, Public Education Specialist, Stormwater Engineering Technician (2), Stormwater Administrative Assistant and Construction Management Coordinator. We recommend that the current

Stormwater Engineer position in the Town personnel structure be restructured as the Stormwater Services Program Manager, and that the Development Services Engineer, the Public Education Specialist and Administrative Assistant be hired in the first year, resulting in five positions by the end of Year 1 of the program (currently there are two full-time positions, the stormwater engineer and a stormwater technician).

The second Engineering Technician, Construction Management Coordinator and the Water Quality Technician will be hired in year two. This will provide the full complement of positions directly charged to the enterprise fund and ensure a successful implementation of the watershed master planning and water quality permit compliance. In addition, the operations program will provide increased maintenance, both of systems located in street rights-of-way and along open channels. Our cost analysis incorporates the resource requirements that such additional work implies. This does not assume that the Town will necessarily add new staff positions internally but it will provide those resources to the Public Works Department to maintain the efficiencies and effectiveness of similar resources found in the street maintenance program, supporting new positions and contracting out certain services as best meets the needs.

Some or all of the new stormwater positions might be created by renaming and transferring existing positions from other departments. Town field crews might be supplemented in some cases by outside contractors with special expertise and equipment, and consulting engineers might be retained to assist with design and other technical issues. Other existing personnel are supported by direct transfer of funds from the Utility as a “purchase” of services by the Utility Fund from the General Fund, such as engineering and inspection needs.

The wage, salary, and benefit costs associated with personnel positions proposed were estimated based on the Town’s compensation schedule. To ensure a full accounting of direct personnel costs attributable to the Utility, an average overhead burden of twenty-eight (28) percent was applied. This covers retirement, health insurance, and other payroll related costs associated with employment.

The cost of Supplies and Services was estimated by evaluating the program strategy, projecting what will be needed to carry it out, estimating the mix of in-house and outside services, and referencing current costs as indicated in the Town’s budget and related to us by the staff in interviews. The cost of completing the recommended system planning and inventory maintenance activities was projected based on experiences in other similar situations. It is assumed that private vendors will provide a portion of that work and the cost will be treated as a service expense. Town staff in other departments may be directly involved, and it is assumed that their participation will be also treated as services.

Capital Expenses are limited to costs that will be incurred directly by the Utility, including construction of improvements to the drainage systems, land, easements, computer hardware and software, capital equipment, plus the annualized debt service of capital improvement bonds issued used to pay for such assets, should bond financing be utilized. We also assumed that the cost of equipment used for a variety of Town functions will be shared equitably with the other accounting units that make use of it, with initial capitalization of equipment being funded by the Town and billed to the Utility in proportion to its use for stormwater operations (e.g., camera equipment for Public Works crews used to inspect the underground systems).

As noted previously, some uncertainty remains regarding the total infrastructure capitalization needs that will be identified in the master plan process. We have assumed that an initial capital program based on the plan could be funded beginning in year three by a revenue bond issue, with debt service provided by service fees. State highway projects that include stormwater facilities and contributed capital stormwater assets built by developers are not included in this cost analysis.

3.3 Assumptions

The following assumptions have been used in projecting the cost of service.

- The program strategy drives the cost analysis. It sets forth a significantly increased level of effort that will resolve many long-standing drainage problems. It does not call for simply maintaining the status quo under a new funding source. Planning is a keynote of the program strategy along with a growth in overall services to the Town, and this results in increasing costs of service each year during the analysis period.

- In addition to annual operating and capital costs, it is assumed that non-operating costs like allowances for service fee delinquencies and unspecified operating and capital expenses to provide for emergency situations will be recovered through the service fee. However, these additional revenue requirements are not identified as costs. They are identified and accounted for in the rate study (Section 4 of this report) in order to project the pro forma cash flow of the Utility.

- All costs are stated in constant 2004 dollars in the cost of service analysis. A conservative annual inflation factor of three and one-half (3.5) percent is incorporated into the rate model. The inflation factor is applied only to annual operating expenses.

- The costs are based on a service area covering only the Town. It does not include any neighboring incorporated municipalities or surrounding unincorporated areas. If the Utility is extended by intergovernmental agreement into other municipalities or unincorporated areas, the additional costs of those services will need to be determined.

- We anticipate that the extent of the Town's system responsibilities will change during the five-year analysis period. Initially the Town will be limited by the lack of access to some components of the drainage systems. Over time access will be gained by easements, rights-of-entry and use, and even fee simply ownership of some corridors. This may result in lower than projected operational and capital costs during the analysis period while access issues are resolved; however, long-term growth in overall operational costs should be anticipated.

- The rate methodology, the geographical extent of the service area, and the pace of economic development will all influence the growth of the rate base over time. We project very limited growth in the rate base during the analysis period. New development is estimated to increase the rate base one and a quarter (1.25) percent annually. This is a conservative estimate and may slightly understate the actual growth rate of service fee revenues that will occur should the Town annex any area of significant growth.

- We assume that the stormwater management program will be accomplished by using a mix of in-house resources and outside contracted services. The balance between in-house personnel and contracted services will vary as the program matures and experience is gained, but we do not expect it will significantly alter the cost of service during the initial five year planning period.

- We assume that the physical stormwater system assets and some rolling stock and other equipment owned by the Town will be transferred to the Utility enterprise fund account at no cost. Therefore, it is also assumed that the cost and rate analyses need not account for the capitalization or any previous depreciation of the transferred assets, especially the drainage system infrastructure. Due to the age of many of the stormwater assets and our assumption that their transfer would be without cost to the enterprise, we believe that the Governmental Accounting Standards Board (GASB) Statement 34 may not be applicable to such assets and thus depreciation is not included in the cost and rate analyses. The Town may wish to refer this issue to its accounting staff, attorneys, and outside counsel for their opinions and to ensure consistency with the Town's practices.

3.4 Uncertainties Influencing Costs

Several uncertainties may influence the actual costs of service that the Town will experience as the program strategy is implemented. Some of these uncertainties can be controlled or managed by the Town. Some will simply pose decision choices that have cost implications. In a few cases, the Town's choices will be relatively limited. For example, the Town cannot unilaterally decide that the NPDES Phase II water quality program requirements are too costly or not needed, and refuse to comply with the permit requirements without considering the exposure to fines and other sanctions that are attached to non-compliance. In practical terms, compliance with the NPDES mandate is not optional, so this cost analysis assumes that the Town will fully comply with the conditions of its eventual permit. We estimate the likely costs that will be associated with the renewal of the permit and requirements it will apply, but the expectations of DENR in that regard have not been clearly articulated so some uncertainty remains.

We have assumed that the Orange County property tax billing system will be a viable means of distributing stormwater service fee bills, collecting payments, and accounting for the money. Stormwater bills for some properties will go to non-taxable properties so "stormwater only" accounts may have to be merged with the existing billing system or the Town may need to establish a limited number of accounts that it will bill directly. A reasonable percentage of the cost of billing, collecting, and accounting for payments through the County's tax billing system, plus part of the expense of long-term customer service, is assigned to the Utility in this cost analysis. There is always some uncertainty involved in modifying billing system hardware and software to accommodate an additional service billing.

The initial stormwater billing will generate many customer service contacts. This implies an implementation expense of uncertain magnitude at this time. This cost analysis assumes that the Town will apply special effort to educating the community regarding the Utility before it is established, and that addressing customer inquiries when the service fee bills are initially mailed will be a high priority. We assume that the Town will train current staff to specifically to deal with questions about the stormwater service fee, providing sufficient guidance so that all key points of contact with the public will be aware, to some degree, of the new program and fees and either

be able to address a concern or refer a citizen to the correct staff for assistance. Responsiveness is critical to successful implementation.

Some timing uncertainties exist. We assume that the Town will institute the Utility at the beginning of a fiscal year. However, it does not necessarily have to be implemented at that point. The costs projected for the "years" shown in this report can be prorated if the service fee is instituted in the midst of a fiscal year accounting period. Such an adjustment would not alter the long-term program strategy, the order of priorities, or the total cost of service during the analysis period.

We foresee at least two key issues; future rate increases and the disposition of General Fund revenues previously spent on stormwater management. We have evaluated the service fee rate impacts of alternative decisions on these issues. This report addresses the service fee implications of reviewing the rate in Year 3 of the analysis period, a point at which the Master Planning will provide sufficient details on the capital program needs for major systems. The Town will bill itself for the public roadway imperviousness under its ownership and responsibility. A portion of the General Fund current resources transferred into the Utility will be needed to pay the Town's own stormwater bill. The General Fund will be relieved an amount equal to the current level of direct stormwater funding ($900,000 approximately) less the fees due for Town-owned developed property.

The Town may occasionally need to revisit its basic rate decisions as various uncertainties are resolved. The progress of the program and suitability of the rates and revenue stream should be evaluated each year by the staff to determine if any change in methodology or rates appears to be warranted. It is recommended that the rate be reviewed in Year 3, at the latest to ensure that the rate is providing the resources needed and to take into consideration the capitalization needs of the initial Master Plans completed at that time. The need for adjustments to the rate methodology and/or the level of charges would depend primarily on the pace at which enhancements in operations and maintenance occur, the magnitude and timing of capital expenditure needs, whether bonding is employed to pay for major projects, and future NPDES requirements. These issues involve numerous uncertainties that may impact costs.

3.5 Estimated Expense by Major Cost Center

3.5.1 Administration

Table 3.1 summarizes the estimated cost of stormwater management administration for the five-year analysis period. As suggested by the functions listed previously, it encompasses a variety of administrative activities and support costs. Only direct administrative costs of the stormwater program that are not assignable to other cost centers are allocated to the administration cost center. Administrative and overhead costs, including personnel, supplies, and contracted services that could be directly assigned to the engineering, operations, regulatory, capital improvement, and water quality cost centers were so allocated in this cost analysis.

A substantial portion of two personnel positions, the Stormwater Services Manager and the Administrative Assistant, is allocated to the administration cost center as well as a portion of the time for oversight by the Town Engineer. The cost estimate assumes that a portion of other Town's staff positions that are involved in the administration of stormwater management but assigned to other accounting funds (e.g., Town Attorney) will be allocated to the Utility enterprise fund through an inter-fund services transfer.

Table 3.1 Administration Costs of Service

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	$ 60,237	$ 89,578	$ 72,125	$ 96,548	$ 130,549
Supplies	12,400	16,000	12,000	12,000	12,000
Services	118,750	106,450	100,450	100,450	100,450
Capital Expenditures	36,900	5,000	4,00	20,000	11,000
Total	$ 228,287	$ 217,028	$ 188,575	$ 228,998	$ 253,999

Supplies and Services costs related to the administration of the program include office mobilization, copying, telephone, office supplies, postage, radio and communications, and other support items. The administration cost center includes outside services such as billing, finance, special legal counsel, personnel recruitment and advertising, and general public education costs such as audio-visual presentations, brochures, displays, and opinion and customer service surveys. It is assumed that an outside cost of service analysis and rate study will be required in Year 2 to evaluate a potential rate increase in Year 3, and an additional analysis will be needed in Year 5 once the final sub-basin plans are complete. Capital expenditures allocated to administration are limited to office equipment, furniture, and computer hardware and software.

3.5.2 Engineering, Modeling and Planning

Much more emphasis will be placed on stormwater engineering and other technical functions as the Town shifts from a largely reactive approach to stormwater management to one that identifies existing and future needs and plans timely preventive measures and solutions on a system-wide basis. The estimate of engineering costs summarized in Table 3.2 is based on a projected schedule of engineering activities that we believe will be consistent with the type of capital projects known today, the rate of development within the community and the oversight needed for the Master Planning process.

Engineering functions will support operational programs as well as construction of capital improvements. This will be especially important during the first few years as routine maintenance is upgraded, remedial repairs are constructed, and master plans are translated into project designs. For example, in Year 1 engineering activities will focus on support of immediate improvements in operations and design of high-priority remedial repair projects along with the Watershed Master Plan process. Then the engineering emphasis will shift to major capital projects identified in the Master Plans and funded either through a rate increase or a bond issue, or both. Over time the engineering functions will gravitate toward technical support of maintenance and water quality functions.

Table 3.2 Engineering Costs of Service

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	$ 80,640	$ 85,284	$ 110,199	$ 115,782	$ 145,459
Supplies	3,400	3,400	3,400	3,400	3,400
Services	314,000	308,000	258,000	233,000	233,000
Capital Expenditures	26,000	17,000	26,000	17,000	26,000
Total	$ 424,040	$ 413,684	$ 397,599	$ 369,182	$ 407,859

Engineering also involves assembly and maintenance of data about the drainage systems. Information management database systems will need to be created or expanded to support operational and regulatory activities. The Town's stormwater drainage system records are incomplete and a completed system inventory, field verified and updated with additional data points, should be a primary goal in year one. Because many of the other enhancements to the stormwater program are dependent on this information and related engineering analyses, preparing system and access inventories has been emphasized in the recommended program strategy in concert with Master Planning efforts.

The engineering costs estimated in this analysis for personal services and operating expense (primarily Town engineering resources and private consultants) are predicated on: 1) providing an internal engineering management capability within the Stormwater Division staff; 2) relying heavily on the Town's engineering group and private consultants to meet engineering needs that vary significantly during the course of the year or change from year to year; and 3) deferring any decision on whether to provide additional in-house engineering, technical support, and construction management capability beyond those recommended in this study, until after a major capital improvement program is decided upon, through the drainage Master Plans and initiated through Town Council adoption of a CIP for drainage.

A new full-time Development Services Engineer position along with an additional engineering technician is identified for the stormwater program staff. The Utility will "hire" additional engineering services from the Town's Engineering group (through transfer of funds from the utility to the General Fund) and private vendors. These mayl include project managers and technical specialists, with primary responsibilities including master planning, inventory of system, construction management, formulation of development regulations, and support of water quality programs.

The Supplies costs cover basic materials and supplies required by the engineering staff of the Utility. Most Services costs are related to contracted professional engineering services to be provided by the Town and/or outside vendors. The only capital cost assigned to the engineering cost center is for office furnishings, computers, and suitable software for the new engineering staff.

3.5.3 Operations

The estimated operational costs of the program summarized in Table 3.3 are intended to: 1) make substantial progress toward attaining a preventive level of routine maintenance; and 2) reduce the backlog of remedial repair needs that has been growing each year as older stormwater systems continue to age and deteriorate.

Table 3.3 Operational Costs of Service

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	$ 6,983	7,164	7,690	9,863	7,783
Supplies	69,200	69,200	69,200	69,200	69,200
Services	371,300	370,800	370,800	370,800	370,800
Capital Expenditures	143,000	143,000	143,000	143,000	143,000
Total	$ 590,463	590,164	590,690	592,863	590,783

The projected operational costs are based on an estimate of system conditions drawn from brief field investigations and discussions with staff. A detailed system inventory or condition profile was not available. Routine cleaning, remedial repair, and replacement needs that presently exist were estimated based on the land area of the Town. An estimate was also made of the age of the systems and rate of deterioration due to aging. These circumstances combine to influence both routine and remedial maintenance demands. Productivity assumptions based on the Town's existing budgets and experiences and those of comparable programs elsewhere were used in projecting the operations resource requirement. We must stress that these estimates may not fully account for the cost of meeting the stated objective of attaining a preventive level of service.

It was determined that substantially achieving a preventive level of routine maintenance service in ten years is potentially attainable, but only if the Town commits to significantly increasing the resources applied to that purpose. One advantage offered by the five-year timeframe used in this report is that the operating strategy can be easily adjusted to fit evolving needs once experience is gained in the field and suitable support systems are in place.

The projected expenditures arrived at through this process assume that the growth of operational capability will occur in year one with sufficient resources to provide an additional dedicated crew in the Public Works Department to focus on backlog. The resources address both additional crew personnel and the supporting equipment to ensure that they are responsive to the needs.

We believe that the maintenance can be primarily proactive in ten years, assuming that adequate resources are allocated to that purpose, access can be gained to the systems requiring attention, and additional staffing and/or private vendor services can be obtained. Additional system deterioration will no doubt continue to emerge as the infrastructure ages. The amount of remedial repair work that will need to be undertaken will also depend on the Town's policies regarding the extent of service to be provided, and the pace at which easements, right-of-way ownership, and other access rights can be acquired. The Town may take on more responsibility along State-system streets to create a more consistent response to the citizens and business in Chapel Hill. Policy decisions such as this will impact the extent to which resources are adequate. During the rate review for the third program year, consideration should be given to whether progress is being made on building a proactive, responsive maintenance service at a pace acceptable to the community.

This analysis assumes that the Town's street maintenance crews will perform most of the routine maintenance and some of the remedial repairs. We assume that Public Works Department crews will continue to perform maintenance of the systems. The option exists to solicit outside services, but the level of effort and cost should be relatively comparable under either scenario or a combination of the two. It may be more cost effective to contract with private vendors to perform some major remedial repairs and operational functions that are seasonal in nature, for example vegetative control along stream channels. Regardless, the Utility staff will have to ensure that contract management and oversight of the maintenance and repair work is diligently performed. The actual mix of in-house and contracted services may shift with experience, but the estimated total level of spending contained in this report is a resource commitment consistent with the projected schedules for increasing routine and remedial maintenance activities.

Personnel costs are limited to the partial allocations of the Stormwater Division staff to provide some engineering assistance to the Public Works staff. They will work with them to identify priorities, administer the allocation of work between in-house and outside groups, and provide specialized technical support to ensure that operations and maintenance are consistent with desired standards.

The Supplies category of costs is for materials used in routine maintenance of the systems performed by in-house resources. It is assumed that the utility will either purchase those supplies directly or be billed for them by other Town departments such as Public Works. It is assumed that supplies costs associated with work done by outside vendors will be folded into contract charges, and those costs are treated as Services in this analysis. Supplies required for remedial repairs are included in the capital expense cost category.

Both in-house labor and outside contracted maintenance are treated as a Services expenses in this analysis. Most day-to-day stormwater operations will be provided by the Town's Public Works street maintenance crews. The costs should be tracked and billed to the Utility enterprise fund by maintaining detailed records of crew assignments to stormwater management. The Town may also hire outside contractors to provide some maintenance and remedial repairs. The current and future requirements of the Town's NPDES permit will likely demand enhanced operations and maintenance for water quality purposes, some of which may involve additional staffing and some that can be more efficiently accomplished by outside contractors.

The capital costs projected for the operational cost center are limited to remedial repairs to the systems. It is assumed that any equipment that will be needed for stormwater operations, such as a new vacuum truck, will be acquired by the Town, assigned to Public Works, and billed to the Utility enterprise fund as part of service charges. Such equipment may be used for a variety of purposes, and this analysis assumes that the costs will be apportioned among the user departments, if appropriate.

3.5.4 Regulation

The estimated cost of regulation is summarized in Table 3.4, below. For the purposes of this analysis, the regulation cost center was used to isolate the expense of development plan review and inspection activities associated with stormwater systems and erosion and sediment control. It is assumed that current practices will continue and be improved.

Personnel costs in this cost center are limited to utility staff oversight of plan review and inspection functions that will be performed by other Town work groups. A new construction management coordinator is proposed for Year 2 as well as a Water Quality Technician and will support the work of Orange County to oversee construction underway inside the Town limits as well as local compliance with the NPDES permit requirements. Supplies costs assigned to this cost center support the Construction Management Coordinator as the Water Quality Technician is supported under the cost category of Stormwater Quality. Estimated Services costs are for plan review, inspection, and other regulatory services provided by other Town work groups. Capital costs include a new computer and a vehicle for the additional position.

Table 3.4 Regulation Costs of Service

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	$ 38,573	86,270	89,075	98,505	72,234

Supplies	0	850	850	850	850
Services	49,400	49,650	49,650	49,650	49,650
49,650	0	5,000	4,000	5,000	4,000
Total	$ 87,973	141,770	143,575	154,005	126,734

3.5.5 Capital Expenditures

Capital expenses include infrastructure improvements, land, and acquisition of rights-of-way and access rights. In addition to the actual cost of construction or acquisition, this cost center includes Utility funded personnel and other expenses directly associated with capital expenditures. Capital Expenditures in the first five years are not expected to include the capitalization of equipment or other assets.

Personnel costs in this cost center are limited to staff responsible for capital program management. This assumes that some project construction management will be performed by the Town Engineering staff and billed to the Utility enterprise fund as a service, but it could also be outsourced to private vendors. Services costs are primarily engineering associated with pay-as-you-go and bonded projects. Capital costs are those related to the infrastructure assets themselves, whether they are expensed or bonded.

Most stormwater capital improvements have historically been provided by a combination of asset contributions associated with private development projects, highway projects, and appropriations in the Town's annual budget (pay-as-you-go funding). The estimated capital expenses for the five years shown in Table 3.5 represent only a portion of the overall stormwater capital investment need that we believe exists in Chapel Hill. The master plan process will provide valuable insights regarding the magnitude of stormwater infrastructure needs the Town faces over the long-term.

Table 3.5 Capital Improvement Costs of Service

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	$ 26,394	22,875	39,378	50,879	53,206
Supplies	0	0	0	0	0
Services	52,000	48,000	48,000	48,000	48,000
Capital Expenditures	250,000	275,000	475,000	475,000	475,000
Total	$ 328,394	345,875	562,378	573,879	576,206

We assume that other agencies and private parties will continue to be responsible for some infrastructure investment. For example, the core stormwater components of Department of Transportation highway projects in Chapel Hill will continue to be funded by NCDOT. Some ancillary stormwater improvements along the State highway corridors will likely be the Town's responsibility. Private developers are expected to continue to fund stormwater system improvements in their residential and commercial projects.

3.5.6 Stormwater Quality Management

Table 3.6 summarizes the estimated cost of stormwater quality management for the five-year analysis period. It is assumed that the Town's stormwater quality management program will fully comply with the conditions of its NPDES permit. An element of uncertainty exists regarding the North Carolina's expectations for the Phase II NDPES program due to difficulties in finalization of the rules. The projected costs represent our current best estimate of compliance with the new permit requirements.

The estimated direct Personnel cost for the water quality program represents a substantial portion of the water quality technician, a portion of the engineering technician positions, and some leadership personnel costs for enforcement and review of regulatory actions imposed throughout the Town. Supply costs are minimal. The projected expense of Services costs includes water quality master planning in conjunction with the water quantity master planning tracked under the Engineering/Modeling and Planning cost category. Services also include some support services provided by other Town departments, as well as projects that will be needed to ensure NPDES permit compliance. Capital expense estimated for the stormwater quality program include monitoring equipment, new computers and vehicles in support of the new position

Table 3.6 Stormwater Quality Management Costs of Service

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	$ 60,262	116,040	132,462	119,613	141,138
Supplies	0	850	850	850	850
Services	230,000	230,250	230,250	205,250	205,250
Capital Expenditures	49,800	65,000	64,000	85,000	64,000
Total	$ 340,062	412,140	427,562	410,713	411,238

3.7 Summary of Costs

Tables 3.7 presents a summary of the total projected cost of services and facilities. It is important to state that this represents the resources necessary to address the objectives of the priorities defined through the past 12 years of study on drainage issues in Chapel Hill. This is not a budget, as that process of budgeting under the rules and regulations of the State of North Carolina is in the purview of the Town Council each year, as it serves as the governing body of the utility.

Table 3.7 Total Program Costs of Service

	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	$ 273,069	407,210	450,930	491,190	550,370
Supplies	85,000	90,300	86,300	86,300	86,300
Services	1,135,450	1,113,150	1,057,150	1,007,150	1,007,150
Capital Expenditures	505,700	510,000	716,000	745,000	723,000
Total	$ 1,999,219	2,120,660	2,310,380	2,329,640	2,366,820

Section 4 - Rate Study

4.1 Overview

North Carolina Statutes and the Chapel Hill's Town Charter enable the Town to perform certain functions, including but not limited to stormwater management, and provide some latitude to the Town's Council in its funding decisions. By using a blend of funding mechanisms and accounting instruments such as an enterprise fund, Chapel Hill can create an independent revenue stream and dedicated stormwater management funding.

Service fee funding under a stormwater utility is now widely practiced. Utility service fee rate-making practices elsewhere are a practical and valid reference in designing a service fee for the program in Chapel Hill. However, we must stress that the most important consideration in the design of service fee rates is the program strategy. The rates must be designed to fit Chapel Hill's needs and circumstances. What works well in one community may not fit the program priorities of another.

Several service fee rate methodologies were examined in the course of this study. They are described in Section 2 of this report. The rate methodologies involve basic rate parameters such as impervious area and gross property area, rate modifiers that might be used to enhance equity or reduce the cost of implementation, and other funding methods that can be blended with service fees.

4.2 Locally Determined Rate Design Decisions

A major advantage of stormwater service fee funding is that the Town Council has broad authority to design its rate methodology to fit local circumstances and practices and achieve an allocation of the cost of services and facilities that it deems desirable and appropriate in Chapel Hill. There are no absolute rules or proscriptions. When local service fee rates are challenged in court, judges generally defer to the judgment of a locally elected legislative authority in rate-making issues, as long the process is proper and complete and the resulting fees are not illegally discriminatory or confiscatory.

The principle requirement the courts have applied to local elected officials' broad authority is that a utility service fee rate methodology must be fair and reasonable and the resulting charges must bear a substantial relationship to the cost of providing the services and facilities. The latter is commonly referred to as a *rational nexus* test. Elected officials may not be arbitrary and capricious in making decisions involving service fee rates, and the selected rate methodology may not be illegally discriminatory or confiscatory in its application. Beyond those general restrictions, a community's elected officials have great latitude in determining what type of rate structure and level of fees are appropriate.

The issue of discrimination requires some clarification. The fundamental purpose of a service fee rate methodology is to "discriminate" (or differentiate) among various customers so that those who place a greater cost burden on the program and facilities pay commensurately higher fees. However, service fees may not be structured in ways that would illegally discriminate among customers based on gender, age, religion, race, ethnicity or other banned characteristics. For example, a wastewater utility providing sewage treatment services and facilities might charge cheese processors a higher service fee per unit of flow than residential customers because the

peak amount of flow and the strength of the effluent cheese processors discharge to the sewer system demands larger conveyance facilities and more expensive treatment processes. However, a given cheese maker couldn't be charged more or less than others simply because they were a Dutch (or Swiss, or Danish) cheese maker.

4.3 Recommended Rate Methodology

Based on the proposed program strategy and the ***Rate Structure Analysis*** described in this report, an impervious area rate methodology is recommended. Impervious area methodologies are used by more than fifty (50) percent of all stormwater utilities.

We recommend that a tiered residential rate structure be adopted. The Town has sufficient data to provide the level of analysis necessary to establish an appropriate billing units and to differentiate the demand for service, as measured by imperviousness, within the rate base of single family detached properties. An analysis of all single-family residential (SFR) properties in Chapel Hill indicates that an appropriate billing unit of 2,000 square feet of impervious area be set for the Equivalent Rate Unit, based on the percent change measured at each 500 square foot increment in the total pool of SFR properties in the database. The equivalency billing unit is benchmarked to residential properties for simplicity of understanding within the entire community of property owners.

The ***equivalency unit*** would serve as the divisor for determining fees for all non-SFR parcels. The purpose of an equivalent unit is to normalize the application of the impervious area rate parameter to dissimilar properties. The actual measured impervious coverage of each non-SFR property would be divided by the equivalency unit to calculate the number of units to be charged. The number of equivalent impervious area units on each non-residential parcel would be multiplied times the same rate per unit that would be applicable to the residential lowest rate. Each 2,000 square feet of impervious coverage, or increment thereof, on non-SFR properties would be charged the same amount under the proposed rate concept.

A full range of modifying factors that could be applied to the basic impervious area rate methodology was considered. In the final analysis, we recommend that the Town adopt only two modifying factors as part of the initial rate structure, the use of service charge credits and leveraging utility fees for grants from the State of North Carolina or Federal grants or cost-share programs. One or more of the other modifiers may be worthy of reconsideration in the future.

Secondary funding methods are a critical element of the funding strategy. The most significant secondary funding opportunity could involve retaining the appropriation of General Fund resources for a portion of the stormwater management costs. Approximately $0.9 million was budgeted for primary or direct stormwater functions in Fiscal Year 2003. Service fees revenues could partially or totally substitute for these sources of funding. Consideration was given to retaining the General Fund contribution to managing the overall program and it was determined that the more equitable and appropriate process would be for the Town to charge itself for all developed properties, including the roadway network, maintaining the integrity of the rate structure and rate base for the utility.

The following funding methods were judged to be potentially practical for the Town's stormwater management program at some point in the future. They are not recommended for immediate implementation, but should be considered as the program moves forward and the program and cost of service information becomes more refined.

- Special fees termed “system development charges” could be applied to new development to equalize financial participation in capital costs over time, especially if the Town aggressively pursues funding of the capital improvements identified in the master plan.

- In-lieu-of-construction fees could be adopted that would allow developers to participate in the cost of regional stormwater facilities as an alternative to requiring that every development build on-site stormwater detention systems.

- Special assessments might be used to expedite small, localized capital improvement projects, but we believe the Utility service fee is adequate for such purposes by applying local surcharges.

- Developer extension/latecomer fees for private stormwater system extensions could be adopted to properly apportion the cost of infrastructure that will serve currently undeveloped areas.

4.4 Projected Rate Base

The “rate base” that will be available in Chapel Hill to support the stormwater program through service fees was determined by preparing a detailed analysis of residential and non-residential properties in the Town. The rate base represents the total of all clients that will be “served” by the utility and charged for its services. Service is broadly defined and applicable to properties in upland areas as well as those immediately adjacent to stormwater systems, major channels and water courses. Virtually every developed property will be served in various ways by the Town’s efforts to control runoff, provide for the collection of stormwater runoff, reduce erosion, comply with regulatory initiatives and prevent water pollution by stormwater runoff.

The rate base includes residences, commercial and industrial properties, tax-exempt institutional facilities like the University of North Carolina and local schools, State offices, and other developed lands. Eventually, the total rate base for the stormwater program may also include some parties who are not owners of properties. For example, the Town is required to enforce effective construction site practices by its NPDES permit, including erosion and sediment control. Builders might therefore be charged a special service fee to isolate the cost of inspection of on-site erosion control measures to them. In that situation, they would become a component of the utility rate base.

Table 4.1 summarizes the rate base information. The projected rate base assumes that all properties with impervious area will be subject to the service fee, including those in public ownership and those owned by tax-exempt entities such as churches. The projected distribution of billing units among single-family residential and other properties shown in Table 5.1 is consistent with the experiences of stormwater utilities in similarly sized cities throughout the United States.

Table 4.1 Rate Base Summary

Property Type	# of Equivalent Units	% of Equivalent Units
Single-family Residential	19220	31 percent
Non-SFR Properties	31,310	51 percent
Town Roads	11,350	18 percent

Totals	61,880	100.0 %

4.5 Rate and Cash Flow Analysis

A rate and cash flow analysis is used to determine the level of service charges necessary to meet the revenue requirements of the program in the context of several conditions and assumptions. Cash flow is a critical consideration in rate decisions. Unless the rate base grows rapidly, holding a service charge rate constant for several years while program costs are increasing dictates that excess revenue be accrued in the first two or three years and drawn down in the later years of the rate period. We do not believe that the rate base in Chapel Hill will increase at a pace equal to the program costs in the analysis period. Therefore, rate increases will be needed from time to time.

The frequency and amount of possible rate increases are key issues influencing Town/City Councils when they make rate decisions. The rate was analyzed to sustain the rate for the planning analysis period or to show a specific rate increase based on anticipated increases in the capital program. In addition, analysis was conducted on utilization of a single-family residential flat rate. Though not recommended, that option is summarized below.

Table 4.2
Rate Structure Summary

	Flat Rate Residential	Tiered Rate Residential
Rate Held Constant for Five Years	$ 4.78 per month for 5 years ($57.36 annually)	$ 2.92 per month for 5 years ($35.04 annually)
Rate Adjusted in Year 3	$ 4.60 per month in years 1 & 2 $ 4.95 per month in years 3 -5 ($55.20 and $59.40 annually)	$ 2.81 per month in years 1 & 2 $ 3.02 per month in years 3 - 5 ($33.72 and $36.24 annually)

Holding the initial rate constant for five years requires that the initial fees be higher to accommodate the increasing costs projected in the later years. Surplus fund balances must be accrued in the early years to be drawn down in later years as expenditures overtake and pass revenues. Reserves are provided in all cases to address extraordinary operating expenses as well as emergency expenses.

We recommend that the initial service fee rate be set to sustain the five year planning period with a rate review at the end of year two in anticipation of an expanded capital improvement program, using the tiered residential rate. However, it should be noted that this may result in a rate increase in Year 3, depending on the rate analysis and the status of the capital program. This offers a strategic advantage. The Town has some assurance that it can provide the program of service analyzed in the Cost of Service section of this report over the planning period without regard to a rate increase. The public may appreciate the stability of the rate and for large organizations, plan for the expense more effectively. The significant unknown is the capital improvement needs that will be better understood at the end of year two, but may not be fully analyzed, depending on the ability of the Town to complete is major basin Master Plans.

All of the cash flow scenarios are based on the same revenue requirements, ranging from $1.999 million in Year 1 to $2.424 million by Year 5 (including inflation of operating expense). **Total spending over the five years is estimated to be approximately $11.2 million,** without

a value for a bond issuance. This level of spending will provide an effective operating program and a very good start on meeting infrastructure needs.

It should be stressed that the projected service fee rates under all scenarios are generally consistent with the experiences of stormwater management utilities nationally. A fee of $2.50 to $5.00 per month for single-family residential properties is typical around the country.

Tables 4.3 through 4.6 provide a more detailed pro forma cash flow analysis for the Utility under the scenarios. The following points explain some of the terminology in the tables.

- Annual Operating Expense includes all personnel, supplies, and services.

- Capital Expense includes infrastructure additions, land and easements, but does not include contributed capital (improvements built by developers) or projects built and funded by State of North Carolina or federal government agencies.

- Inflation, at an annually compounded rate of three and one-half (3.5) percent, is applied only to Annual Operating Expense in the rate model.

- The Service Fee Revenue Requirement is determined by deducting Other Revenues from the Total Annual Expenses. Other Revenues, such as interest income, grant funds and fund balances carried forward from previous years reduce the revenue that must be generated each year by service fees. Other revenues include fees for special services such as plan review fees for stormwater elements.

- The service fee rates must be set to generate sufficient excess revenue to meet the Service Fee Revenue Requirement, recognizing the non-operating expense items that will reduce the actual cash flow each year. These include allowances for credits, offsets, delinquencies and bad debt as well as contributions to emergency and operating contingency funds. An Adjusted Service Fee Revenue Requirement is the product of this calculation. The Adjusted Service Fee Revenue Requirement is divided by the total number of ERUs to determine the necessary charge per ERU.

- The Service Fee Rate/ERU/Month is set in the rate model to produce a fund balance at the end of Year 5 of no less than five (5) percent or more than ten (10) percent of the projected annual operating expense in Year 6. A year-end fund balance is a prudent and common provision for municipal utilities that must operate at a financial arm's length from other accounting units. It provides a cushion against high seasonal expenditures, short-term revenue shortfalls, and emergencies such as natural disasters.

Table 4.3
Pro Forma Cash Flow Analysis
Scenario #1

Chapel Hill, North Carolina					
Stormwater Cost of Service Analysis/Rate Model					
Revenue/Expenditure (Cash Flow) Analysis					
	Year 1	Year 2	Year 3	Year 4	Year 5
Expenses					
Annual Operating Expense	$ 1,493,519	$ 1,610,660	$ 1,594,380	$ 1,584,640	$ 1,643,820
Annual Capital Expense and Bonded Capital Expense	$ 505,700	$ 510,000	$ 716,000	$ 745,000	$ 723,000
Subtotal: with Inflation	$ 1,999,219	$ 2,177,033	$ 2,366,183	$ 2,385,103	$ 2,424,354
Bond Sale Costs and Debt Service	$ -	$ -	$ -		
Bond Debt Service Coverage	$ -	$ -	$ -	$ -	$ -
Operating Reserve	$ 132,879	$ (1,343)	$ (803)	$ 773	$ 494
Emergency Reserve	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Total: Expenses	$ 2,182,098	$ 2,225,690	$ 2,415,379	$ 2,435,876	$ 2,474,848
Other Revenues					
Funds Carried Forward	$ -	$ 134,802	$ 242,265	$ 184,543	$ 133,358
Bond Sales Receipts and Assocated Funds	$ -	$ -	$ -	$ -	$ -
Other Fees and Charges	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Interest Income	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000
Recovered Delinquencies	$ 58,800	$ 41,194	$ 41,709	$ 42,230	$ 42,758
Other Resources	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Total: Other Revenues	$ 253,800	$ 370,996	$ 478,973	$ 421,773	$ 371,116
Service Fee Revenue Requirement	$ 1,928,298	$ 1,854,695	$ 1,936,406	$ 2,014,103	$ 2,103,732
Revenue Stream Reduction Allowances					
Delinquencies and Bad Debt	$ 60,000	43,362.00	43,904	44,453	45,008
Offsets	$ -	$ -	$ -	$ -	$ -
Credits	45,000	54,880	57,789	58,511	59,242
Total: Revenue Reduction Allowances	$ 105,000	$ 98,242	$ 101,693	$ 102,964	$ 104,251
Adjusted Service Fee Revenue Requirement	$ 2,033,298	$ 1,952,937	$ 2,038,099	$ 2,117,067	$ 2,207,983
Estimate of Service Fee Needed/Year					
Annualized ERU Revenue Requirement	$ 2,033,298	$ 1,952,937	$ 2,038,099	$ 2,117,067	$ 2,207,983
Number of ERU	61,875	62,648	63,432	64,224	65,027
Estimated Monthly Charge per ERU	$ 2.74	$ 2.60	$ 2.68	$ 2.75	$ 2.83
Service Fee Recommendation					
Recommended Monthly Charge per ERU	$ 2.92	$ 2.92	$ 2.92	$ 2.92	$ 2.92
Estimated Annual ERU Revenue	$ 2,168,100	$ 2,195,201	$ 2,222,641	$ 2,250,424	$ 2,278,555
Estimated Year-end Revenue Surplus (Deficit)	$ 134,802	$ 242,265	$ 184,543	$ 133,358	$ 70,571
Fund Balance Allowance Test (5 to 10 %)	8.4%	15.2%	11.6%	8.1%	4.3%

Table 4.4
Pro Forma Cash Flow Analysis
Scenario #2

Chapel Hill, North Carolina					
Stormwater Cost of Service Analysis/Rate Model					
Revenue/Expenditure (Cash Flow) Analysis					
	Year 1	Year 2	Year 3	Year 4	Year 5
Expenses					
Annual Operating Expense	$ 1,493,519	$ 1,610,660	$ 1,594,380	$ 1,584,640	$ 1,643,820
Annual Capital Expense and Bonded Capital Expense	$ 505,700	$ 510,000	$ 716,000	$ 745,000	$ 723,000
Subtotal: with Inflation	$ 1,999,219	$ 2,177,033	$ 2,366,183	$ 2,385,103	$ 2,424,354
Bond Sale Costs and Debt Service	$ -	$ -	$ -		
Bond Debt Service Coverage	$ -	$ -	$ -	$ -	$ -
Operating Reserve	$ 132,879	$ (1,343)	$ (803)	$ 773	$ 494
Emergency Reserve	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Total: Expenses	$ 2,182,098	$ 2,225,690	$ 2,415,379	$ 2,435,876	$ 2,474,848
Other Revenues					
Funds Carried Forward	$ -	$ 53,127	$ 80,043	$ 96,542	$ 120,347
Bond Sales Receipts and Assocated Funds	$ -	$ -	$ -	$ -	$ -
Other Fees and Charges	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Interest Income	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000
Recovered Delinquencies	$ 58,800	$ 39,642	$ 40,138	$ 43,676	$ 44,222
Other Resources	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Total: Other Revenues	$ 253,800	$ 287,769	$ 315,180	$ 335,219	$ 359,569
Service Fee Revenue Requirement	$ 1,928,298	$ 1,937,921	$ 2,100,199	$ 2,100,657	$ 2,115,279
Revenue Stream Reduction Allowances					
Delinquencies and Bad Debt	$ 60,000	41,728.50	42,250	45,975	46,550
Offsets	$ -	$ -	$ -	$ -	$ -
Credits	45,000	52,813	59,768	60,515	61,271
Total: Revenue Reduction Allowances	$ 105,000	$ 94,541	$ 102,018	$ 106,490	$ 107,821
Adjusted Service Fee Revenue Requirement	$ 2,033,298	$ 2,032,463	$ 2,202,217	$ 2,207,147	$ 2,223,100
Estimate of Service Fee Needed/Year					
Annualized ERU Revenue Requirement	$ 2,033,298	$ 2,032,463	$ 2,202,217	$ 2,207,147	$ 2,223,100
Number of ERU	61,875	62,648	63,432	64,224	65,027
Estimated Monthly Charge per ERU	$ 2.74	$ 2.70	$ 2.89	$ 2.86	$ 2.85
Service Fee Recommendation					
Recommended Monthly Charge per ERU	$ 2.81	$ 2.81	$ 3.02	$ 3.02	$ 3.02
Estimated Annual ERU Revenue	$ 2,086,425	$ 2,112,505	$ 2,298,759	$ 2,327,494	$ 2,356,587
Estimated Year-end Revenue Surplus (Deficit)	$ 53,127	$ 80,043	$ 96,542	$ 120,347	$ 133,487
Fund Balance Allowance Test (5 to 10 %)	3.3%	5.0%	6.1%	7.3%	8.1%

Table 4.5
Pro Forma Cash Flow Analysis
Scenario #3

Chapel Hill, North Carolina					
Stormwater Cost of Service Analysis/Rate Model					
Revenue/Expenditure (Cash Flow) Analysis					
	Year 1	Year 2	Year 3	Year 4	Year 5
Expenses					
Annual Operating Expense	$ 1,493,519	$ 1,610,660	$ 1,594,380	$ 1,584,640	$ 1,643,820
Annual Capital Expense and Bonded Capital Expense	$ 505,700	$ 510,000	$ 716,000	$ 745,000	$ 723,000
Subtotal: with Inflation	$ 1,999,219	$ 2,177,033	$ 2,366,183	$ 2,385,103	$ 2,424,354
Bond Sale Costs and Debt Service	$ -	$ -	$ -		
Bond Debt Service Coverage	$ -	$ -	$ -	$ -	$ -
Operating Reserve	$ 132,879	$ (1,343)	$ (803)	$ 773	$ 494
Emergency Reserve	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Total: Expenses	$ 2,182,098	$ 2,225,690	$ 2,415,379	$ 2,435,876	$ 2,474,848
Other Revenues					
Funds Carried Forward	$ -	$ 123,552	$ 219,921	$ 150,978	$ 88,432
Bond Sales Receipts and Assocated Funds	$ -	$ -	$ -	$ -	$ -
Other Fees and Charges	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Interest Income	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000
Recovered Delinquencies	$ 58,800	$ 40,980	$ 41,492	$ 42,011	$ 42,536
Other Resources	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Total: Other Revenues	$ 253,800	$ 359,533	$ 456,414	$ 387,989	$ 325,968
Service Fee Revenue Requirement	$ 1,928,298	$ 1,866,158	$ 1,958,966	$ 2,047,886	$ 2,148,880
Revenue Stream Reduction Allowances					
Delinquencies and Bad Debt	$ 60,000	43,137.01	43,676	44,222	44,775
Offsets	$ -	$ -	$ -	$ -	$ -
Credits	45,000	54,595	57,489	58,207	58,935
Total: Revenue Reduction Allowances	$ 105,000	$ 97,732	$ 101,165	$ 102,430	$ 103,710
Adjusted Service Fee Revenue Requirement	$ 2,033,298	$ 1,963,890	$ 2,060,131	$ 2,150,316	$ 2,252,590
Estimate of Service Fee Needed/Year					
Annualized ERU Revenue Requirement	$ 2,033,298	$ 1,963,890	$ 2,060,131	$ 2,150,316	$ 2,252,590
Number of ERU	37,602	38,072	38,548	39,030	39,518
Estimated Monthly Charge per ERU	$ 4.51	$ 4.30	$ 4.45	$ 4.59	$ 4.75
Service Fee Recommendation					
Recommended Monthly Charge per ERU	$ 4.78	$ 4.78	$ 4.78	$ 4.78	$ 4.78
Estimated Annual ERU Revenue	$ 2,156,851	$ 2,183,811	$ 2,211,109	$ 2,238,748	$ 2,266,732
Estimated Year-end Revenue Surplus (Deficit)	$ 123,552	$ 219,921	$ 150,978	$ 88,432	$ 14,142
Fund Balance Allowance Test (5 to 10 %)	7.7%	13.8%	9.5%	5.4%	0.9%

Table 4.6
Pro Forma Cash Flow Analysis
Scenario #4

Chapel Hill, North Carolina					
Stormwater Cost of Service Analysis/Rate Model					
Revenue/Expenditure (Cash Flow) Analysis					
	Year 1	Year 2	Year 3	Year 4	Year 5
Expenses					
Annual Operating Expense	$ 1,492,519	$ 1,609,660	$ 1,593,380	$ 1,583,640	$ 1,642,820
Annual Capital Expense and Bonded Capital Expense	$ 506,700	$ 511,000	$ 717,000	$ 746,000	$ 724,000
Subtotal: with Inflation	$ 1,999,219	$ 2,176,998	$ 2,366,148	$ 2,385,068	$ 2,424,319
Bond Sale Costs and Debt Service	$ -	$ -	$ -		
Bond Debt Service Coverage	$ -	$ -	$ -	$ -	$ -
Operating Reserve	$ 132,797	$ (1,343)	$ (803)	$ 775	$ 574
Emergency Reserve	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Total: Expenses	$ 2,182,016	$ 2,225,655	$ 2,415,344	$ 2,435,843	$ 2,474,893
Other Revenues					
Funds Carried Forward	$ -	$ 42,415	$ 58,720	$ 66,488	$ 81,446
Bond Sales Receipts and Assocated Funds	$ -	$ -	$ -	$ -	$ -
Other Fees and Charges	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Interest Income	$ 65,000	$ 65,000	$ 65,000	$ 65,000	$ 65,000
Recovered Delinquencies	$ 58,800	$ 39,437	$ 39,930	$ 43,505	$ 44,049
Other Resources	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Total: Other Revenues	$ 253,800	$ 276,852	$ 293,650	$ 304,993	$ 320,495
Service Fee Revenue Requirement	$ 1,928,216	$ 1,948,804	$ 2,121,694	$ 2,130,850	$ 2,154,398
Revenue Stream Reduction Allowances					
Delinquencies and Bad Debt	$ 60,000	41,512.61	42,032	45,795	46,367
Offsets	$ -	$ -	$ -	$ -	$ -
Credits	45,000	52,539	59,533	60,278	61,031
Total: Revenue Reduction Allowances	$ 105,000	$ 94,052	$ 101,565	$ 106,073	$ 107,398
Adjusted Service Fee Revenue Requirement	$ 2,033,216	$ 2,042,856	$ 2,223,259	$ 2,236,923	$ 2,261,797
Estimate of Service Fee Needed/Year					
Annualized ERU Revenue Requirement	$ 2,033,216	$ 2,042,856	$ 2,223,259	$ 2,236,923	$ 2,261,797
Number of ERU	37,602	38,072.03	38,547.93	39,029.77	39,518
Estimated Monthly Charge per ERU	$ 4.51	$ 4.47	$ 4.81	$ 4.78	$ 4.77
Service Fee Recommendation					
Recommended Monthly Charge per ERU	$ 4.60	$ 4.60	$ 4.95	$ 4.95	$ 4.95
Estimated Annual ERU Revenue	$ 2,075,630	$ 2,101,576	$ 2,289,747	$ 2,318,369	$ 2,347,348
Estimated Year-end Revenue Surplus (Deficit)	$ 42,415	$ 58,720	$ 66,488	$ 81,446	$ 85,551
Fund Balance Allowance Test (5 to 10 %)	2.6%	3.7%	4.2%	5.0%	5.2%

Draft Ordinance

'DRAFT'

AN ORDINANCE TO ESTABLISH A STORMWATER UTILITY FOR THE TOWN OF CHAPEL HILL ( )

BE IT ORDAINED by the Council of the Town of Chapel Hill as follows:

Section 1. Chapter 23, Article I of the Town Code is hereby revised to read as follows:

"ARTICLE I. STORMWATER UTILITY

Sec. 23-1. Findings.

The Council does hereby find that:

(a) North Carolina General Statute Chapter 160A, Article 16 authorizes the Town to acquire, construct, establish, enlarge, improve, maintain, own, operate, and contract for the operation of a public enterprise, including stormwater management programs and structural and natural stormwater and drainage systems of all types, to furnish service to the town and its citizens.

(b) The establishment, by ordinance, of a stormwater management utility which shall be accounted as a separate enterprise fund, will facilitate the provision of stormwater management programs and structural and natural stormwater and drainage system service.

(c) North Carolina General Statute 160A-314 authorizes the Town of Chapel Hill to establish and revise from time to time a schedule of rates and charges to fund the stormwater management programs and structural and natural stormwater and drainage systems of the stormwater management utility.

Sec. 23-2. Purpose.

This ordinance establishes a stormwater management utility as an identified fiscal and accounting fund for the purpose of addressing the stormwater management needs of the Town from a comprehensive approach including stormwater management programs designed to protect water quality by controlling the level of pollutants in, and the quantity and flow of, stormwater and structural and natural stormwater and drainage systems of all types. It sets forth a schedule of charges and defines the control, collection, and disbursal of funds including penalties, appeals and credits.

Sec. 23-3. Definitions.

For the purpose of this Article, the following words, terms, and phrases shall have the meanings given to them in this section, except where the context clearly indicates a different meaning:

Credits shall mean on-going reductions in the stormwater service charge applicable to a given property in recognition of on-site or off-site systems, facilities, measures, and actions taken

by customers to reduce or mitigate the impact of their properties or actions on quantity or quality impacts that would otherwise be managed in the public system. Credits shall be conditioned on the continuing performance of the systems, facilities, measures, or actions in reference to standards adopted by the utility upon which the credits are granted, and may be revised or rescinded. In no case shall credits exceed the amount of the stormwater service charge.

Detached single-family residential shall mean developed land containing one (1) structure which is not attached to another dwelling unit and which contains one (1) or more rooms with a bathroom and kitchen facilities designed for occupancy by one (1) family and shall include single family houses, single family units, manufactured homes, and mobile homes located on individual lots or parcels of lands. Developed land may be classified as 'detached single-family residential' despite the presence of incidental structures associated with residential uses such as garages, carports or small storage buildings. 'Detached single-family residential' shall not include developed land containing: structures used primarily for non-residential purposes; manufactured homes and mobile homes located within manufactured home or mobile home parks; or other multiple unit residential properties such as apartments, condominiums and town homes.

Developed land shall mean property altered from a natural state that contains impervious surface equal to or greater than 500 square feet.

Drainage system shall mean natural and structural channels, swales, ditches, swamps, rivers, streams, creeks, wetlands, branches, reservoirs, ponds, drainage ways, inlets, catch basins, gutters, pipes, culverts, bridges, head walls, storm sewers, lakes, and other physical works, properties, and improvements which transfer, control, convey or otherwise influence the movement of stormwater runoff.

Equivalent Rate Unit (ERU) shall mean two thousand (2,000) square feet of impervious surface or any fraction thereof.

Impervious surfaces shall mean those areas within developed land which prevent or significantly impede the infiltration of stormwater into the soil. Common impervious surfaces include, but are not limited to roof tops, sidewalks, walkways, patio areas, roads, driveways, parking lots, storage areas, brick or concrete pavers, compacted gravel surfaces (roads, driveways, parking and storage areas), and other surfaces which prevent or significantly impede the natural infiltration of stormwater into the soil.

Natural state shall mean where the existing landform, water, soil, and vegetation characteristics generally appear to have been affected primarily by the forces of nature and where development or human disturbances are substantially unnoticeable.

Other properties shall mean any developed land not fitting the definition of detached single-family residential. 'Other properties' shall include, but not be limited to, attached single-family houses, townhouses and condominiums, apartments, boarding houses, hotels and motels, churches, commercial properties which include dwelling units, manufactured home or mobile home parks, commercial and office buildings, storage areas, parking lots and other impervious

areas, parks, recreation properties, public and private schools and universities, hospitals and convalescent centers, office buildings, airports, agricultural uses involving impervious surfaces, and water and wastewater treatment plants. Real properties which are used for other than single-family residential use located in single-family residential structures or duplexes shall be deemed other properties for the purpose of calculating the stormwater service charge. The definition of 'other properties' shall be broadly construed such that any property having areas of impervious surface coverage shall be subject to the stormwater service charge unless otherwise provided.

Service charge shall mean the stormwater service charges applicable to a parcel of developed land which is generally reflective of a parcel's impact or demand for services provided by the Town, resulting in the cost of providing services and facilities to properly control stormwater runoff quantity and/or quality. The service charge will vary from one parcel of developed land to another based upon the amount of impervious surfaces.

Stormwater shall mean the runoff from precipitation that travels over natural state or developed land surfaces and enters a drainage system.

Stormwater management program shall mean programs designed to protect, restore or manage water quality by controlling, reducing, or managing the level of pollutants in, and controlling, reducing, or managing the velocity, volume, and peak flow of, stormwater.

Stormwater service shall mean that organization including its employees as well as other designated personnel that is responsible for implementing the Town's stormwater management program.

Stormwater utility shall mean a management structure that is responsible solely and specifically for the stormwater management program and system and that is supported through a rate structure that is based on the amount impervious surface found on individual properties.

Undeveloped land shall mean land that does not meet the definition of developed lands.

Sec. 23-4. Establishment of a Stormwater Management Utility and Enterprise Fund.

(a) There is hereby established a Stormwater Management Utility for the Town which shall be responsible for stormwater management programs and which shall provide for the management, protection, control, regulation, use, and enhancement of stormwater and drainage systems.

(b) There is hereby established a Stormwater Management Enterprise Fund for the Town or the purpose of dedicating and protecting all funding applicable to the purposes and responsibilities of the Stormwater Management Utility including but not limited to, rents, rates, fees, charges, and penalties as may be established, after notice and a public hearing, by the Town Council and other funds that may be transferred or allocated to the Stormwater Management Utility. All revenues and receipts of the Stormwater Management Utility shall be placed in the Stormwater Management Enterprise Fund and all expenses of the utility shall be paid from the Stormwater Enterprise Fund,

except that other revenues, receipts, and resources not accounted for in the stormwater utility enterprise fund may be applied to stormwater management programs, and stormwater and drainage systems as deemed appropriate by Town Council.

Sec. 23-5. Jurisdiction.

The boundaries and jurisdiction of the stormwater management utility shall extend to the corporate limits of the Town, including all areas hereafter annexed thereto, and such additional areas lying outside the corporate limits of the Town as shall be approved by Town Council.

Sec. 23-6. Impervious Coverage and Rate Unit.

(a) *Impervious coverage*. The amount of impervious coverage of real property is a key factor in the peak rate of stormwater runoff and the pollutant loadings of stormwater runoff discharged to the structural and natural drainage systems and facilities. Therefore, the amount of impervious coverage shall be the primary parameter for establishing the rate structure to distribute the cost of systems and facilities through a schedule of rates, fees, charges, and penalties related to the use and operation of the stormwater utility and public enterprise as established in Section 23.4.

(b) *Establishment of the equivalent rate unit*. The area of 2,000 square feet of impervious surface shall be the basis of one equivalent rate unit. The rate unit is based on an analysis of impervious surface throughout the Town.

(c) *Application of the equivalent rate unit.* Differences in the level and cost of services and facilities across the Town constitute sufficient reason to differentiate in the application of the equivalent rate unit for individual properties.

Sec. 23-7. Schedule of fees and charges.

(a) *Fee schedule adopted.* The schedule of fees and charges set out in this section is hereby adopted and shall apply to all properties within the Town except as altered by credits or exemptions.

(1) *Detached single-family residential*. Each developed detached single-family residential property shall be billed and shall pay pursuant to the number of equivalent rate units determined for each individual property but shall not exceed three equivalent rate units. There shall be no charge for detached single-family residential property with fewer than 500 square feet of impervious surface.

(2) *Other properties*. All other developed properties having impervious coverage, including but not limited to multi-family residential properties with three or more living units, commercial properties, industrial properties, public and institutional properties, church properties, public and private school properties, and publicly owned properties, unless specifically exempted, shall be billed for one (1) Equivalent Rate Unit for each 2,000 square feet or fraction thereof of impervious

coverage on the subject property. There will be no service charge for Other Properties with fewer than 200 square feet of impervious surface.

(b) Charge per Equivalent Rate Unit (ERU). The monthly service charge per Equivalent Rate Unit shall be $2.92 per month.

Sec. 23-8 Billing and Collection

(a) *Method of billing.* Billing and collection of the stormwater service charge and any other rents, rates, fees, charges, and penalties for stormwater management services and facilities shall be administered by the Town Manager.

(b) *Delinquencies.* A stormwater utility service charge billing or other billing for rents, rates, fees, charges, and penalties associated with the stormwater utility shall be declared delinquent if not paid on the following January 5. A delinquent billing shall accumulate an additional penalty at the rate as established for delinquent, unpaid property taxes and shall run from the date of the original billing. This penalty shall be termed a delinquency penalty charge.

(c) *Appeal of disputed bills, adjustments*. If any customer disputes the stormwater utility service charge or any other rents, rates, fees, charges, or penalties adopted pursuant to this chapter, that customer must appeal the billing within 60 days of the charge, stating the reasons for the appeal, and providing information pertinent to the calculation of the bill. A timely appeal shall stay the penalty deadlines. An appeal of a disputed bill shall be filed with the Stormwater Manager, who may direct that the appeal be reviewed and resolved by the Town Stormwater Utility staff. If the customer is not satisfied with the disposition of the appeal, the customer may further appeal the disputed charge to the Town Manager or his designee who shall make the final ruling on the validity of the appeal. The administrative remedies provided in this chapter shall be exhausted before recourse to a court of competent jurisdiction.

Sec. 23-9. Disposition of Service Charges and Fees.

Stormwater Management Utility service charge and fee revenues shall be assigned and dedicated solely to the stormwater management enterprise fund in the Town budget and accounting system, which shall be and remain separate from other funds, and shall be used only to fund stormwater management programs and structural and natural stormwater and drainage systems. The services charges and fees paid to and collected by virtue of the provision of this Article shall not be used for general or other governmental or proprietary purposes of the Town, except to pay for costs incurred by the Town in rendering services to the stormwater management utility.

Sec. 23-10. Credits and exemptions.

(a) *Credit for mitigation measures.* Credits against stormwater management utility service charges are an appropriate means of adjusting fees, rates, rentals, charges, fines, and

penalties in certain cases. Crediting mechanisms may be established by Town Council and, when established, a credit manual shall be issued that will set forth the appropriate process and documentation to obtain such credits. No exception, credit, offset, or other reduction in stormwater service charges shall be granted based on age, race, tax status, economic status, or religion of the customer, or other condition unrelated to the stormwater utility's cost of providing stormwater services and facilities.

(b) *Exemptions.* Except as provided in this Sec. 23-7, no public or private property shall be exempt from stormwater service charges or receive a credit against such service charges. The following exemptions shall be allowed:

(1) Improved public road rights-of-way which have been conveyed to and accepted for maintenance by the North Carolina Department of Transportation and are available for use in common for vehicular transportation by the general public shall be exempt from storm water service charge.

(2) Railroad right-of-way used exclusively for trackage and related safety appurtenances shall be exempted from stormwater service charge and are deemed to be pervious for application of charges."

Section 2. All ordinances or parts of ordinances in conflict herewith are hereby repealed to the extent of such conflict.

Section 3. Any part or provision of this ordinance found by a court of competent jurisdiction to be in violation of the Constitution or laws of the United States or North Carolina is hereby deemed severable and shall not affect the validity of the remaining provisions of the ordinance.

Section 4. This ordinance shall become effective upon its enactment.

This the ____day of _____, 2004.