Greenville City Council Agenda

Thursday, May 9, 2013
5:30 p.m.
City Hall Conference Room 337
200 West Fifth Street

I. Call Meeting to Order

II. Roll Call

III. Approval of Agenda

- Public Comment Period

  The Public Comment Period is a period reserved for comments by the public. Items that were or are scheduled to be the subject of public hearings conducted at the same meeting or another meeting during the same week shall not be discussed. A total of 30 minutes is allocated with each individual being allowed no more than 3 minutes. Individuals who registered with the City Clerk to speak will speak in the order registered until the allocated 30 minutes expires. If time remains after all persons who registered have spoken, individuals who did not register will have an opportunity to speak until the allocated 30 minutes expires.

IV. State of the Stormwater Utility Fund

V. Adjournment

City of Greenville
State of the Stormwater Fund

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Report Updated by the City of Greenville City Manager's Office, Public Works Department and Financial Services Department
May 2, 2013

Section I. History of the Stormwater Utility Fund

In early fall of 2000, City Council approved the creation of a citizen-based advisory committee to review the reports prepared by AMEC Earth and Environmental and make recommendations regarding the funding strategy that should be considered in order to meet pending stormwater regulatory requirements and infrastructure needs. The results of that effort led to a recommendation that the City create a stormwater utility to ensure a stable, equitable funding source for stormwater. Their recommendations were presented to Council in May 2001. The following summarizes those recommendations:

- A stormwater utility be established and a service charge adopted to provide the primary long-term source of funding for stormwater management in Greenville. All properties should be subject to the utility service charge on the basis of the demands they place on the City's stormwater management systems and programs.

- The stormwater utility concept should include secondary funding methods such as general obligation and revenue bonding for major capital improvement projects, in-lieu-of-construction fees, and Federal and State funds.

- The City should minimize administrative costs by using as much of the City's existing organizational structure as possible.

- The City should consider inclusion of service charge credits for facilities that provide water quality and water quantity protection beyond the minimum regulatory requirements.

In May 2001 the City Council established a stormwater utility enterprise fund and authorized an evaluation of cost of service and utility rate structure analysis. This ordinance identifies the Stormwater Utility "shall provide for the management, protection, control, regulation, use and enhancement of stormwater and drainage systems." In July 2003 the utility fee of $2.85 per Equivalent Rate Unit (ERU) was implemented.

The Stormwater Management Control Ordinance was approved in September 2004 establishing the components of the Stormwater Management Program. This Program is funded by the Stormwater Utility Fund. The components of the Program are as follows:

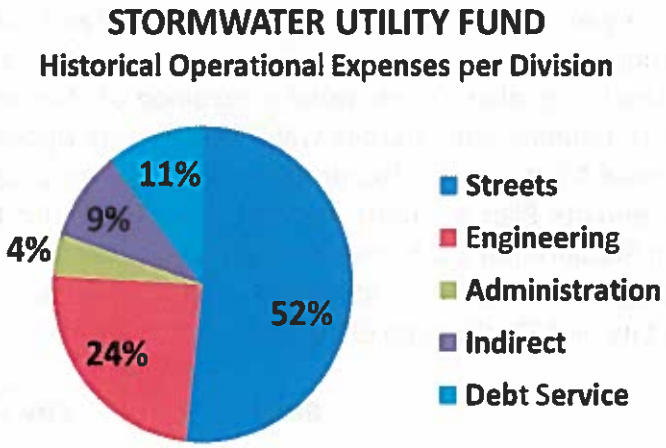
- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Controls
- Post-Construction Site Runoff Controls
- Pollution Prevention and Good Housekeeping for Municipal Operations

Section II: Operational Expenditures/Needs

The operational component of the Fund includes monies allocated to the Streets Division of Public Works for stormwater system maintenance and rehabilitation of existing systems. This specifically includes maintenance activities associated with the existing system (curb and gutter, open ditches/streams, catch basins and pipe systems. Additional monies are allocated to the Engineering Division of Public Works to manage and comply with the permitting requirements imposed by the North Carolina Department of Environment and Natural Resources (NCDENR). Listed below are some of the items of work that the Engineering Division regulates and provides:

- Private Development Plan Review
- Erosion Control Program
- Illicit Discharge Detection and Elimination Program
- Public Education and Involvement
- Inspection of Post Construction Controls (BMPs)
- Contract Management (design, construction, master planning, etc.)
- NFIP Participation and CRS

Since its establishment, the utility has historically funded the operational component of stormwater management as shown in the adjacent graph.



Prior to 2011, stormwater maintenance consisted of street sweeping, storm basin maintenance and ditch maintenance of approximately 30 miles of ditches throughout the City. Crews from the Street Division generally performed vegetative maintenance twice a year as well as address emergency repairs as they came up.

However, with the mushrooming of development throughout the City, the lingering damage from Hurricane Irene and improved mapping of our ditches and streams, the linear mileage of streams, channels and ditches have more than doubled to over 65 miles. Additionally, much of the flooding problems that have arisen are due in part to ditches and streams that have lost capacity due to the deposition of sediments over the years; blockages from storm debris and vegetation; and deteriorated and/or under capacity piped systems. Much of our closed pipe system is comprised of corrugated steel pipe, which is well beyond its useful life and is failing at an alarming rate.

This has necessitated a paradigm shift in our practice of maintaining our open as well as our closed drainage system. The approach is to move away from mechanical mowing of our ditches and hand clearing of larger brush to introducing a herbicide maintenance program as well as a systematic clearing of large vegetation and trees (where allowed) and removal of sediments to improve the capacity of our open drainage system. Once each system is cleaned and sediment removed, then the conveyances will be periodically sprayed with herbicide to keep the nuisance vegetation from returning. Ultimately, the challenge is to open up and improve the capacity of all the open drainage system in the City. In order to do that it will require increasing available manpower as well as obtaining the equipment necessary to complete maintenance on the entire open drainage system. The goal is to minimize cost to the Citizens by contracting the herbicide maintenance and to utilize our Street Division's manpower and equipment to systematically improve and maintain our whole system.

Section III: Capital Expenditures/Needs

The closed drainage system is also in dire need of improvement. As previously mentioned, much of the closed drainage system is very old (>30 years) and has deteriorated to the point of failure. However, we have very little data of what we have as there has never been an inventory of the system, therefore, the management of the overall system is relegated to responding to complaints (sinkholes) and emergency repair work. The first step has been taken recently with the development of Standard Operating Procedures, an infrastructure inventory and master plan for Meetinghouse Branch watershed. This plan has provided a roadmap of stormwater related capital improvement projects to minimize flooding and improve water quality (see Appendix A for the Executive Summary of the Pilot Watershed Master Plan). The projects identified are projects that will be incorporated into the Capital Improvements Plan as funds are made available. The total cost of Flood Control Projects is $ 8M, Stream Stabilization $ 0.5M and Water Quality Retrofits $ 0.5M for the 3 square mile pilot watershed (Meetinghouse Branch). If projected capital costs are extrapolated from the pilot watershed to the entire City and ETJ the total CIP would be:

Projects	City Limits	City Limits and ETJ
Flood Control	$ 96M	$ 181M
Stream Stabilization	$ 6M	$ 11M
Water Quality Retrofits	$ 6M	$ 11M

The results of the Meetinghouse Branch Watershed Master Plan indicate the City will need to expend a considerable amount of resources on Flood Control capital projects to bring our drainage system back up to acceptable design standards. Due to this potential demand on resources Public Works requested our consultant, WK Dickson, analyze impacts to the Meetinghouse Branch watershed if 10-year detention requirements had been in place for both commercial and residential properties. Although these benefits cannot be realized in a built out watershed such as Meetinghouse Branch a considerable

savings in Flood Control projects is realized in outlying areas of the City as well as the ETJ. Those savings are $ 6M and $ 42M, respectively.

Within the projected capital costs for the City Limits based on the Pilot Watershed Master Plan are several projects Public Works has identified as priorities. Those projects include:

- 10th Street Connector Projects
  - ◊ Town Creek Culvert
  - ◊ West 5th Street (Thomas Foreman Park)
  - ◊ Moyewood Pond Rehabilitation Project
  - ◊ Washington Street (9th to 10th)
- Haw Drive

In addition to drainage improvements listed above, the top priority is to complete Watershed Master Plans throughout the City Limits and Extra-Territorial Jurisdiction (ETJ) at an approximate cost of $ 2.7 Million. Appendix B identifies approximate drainage basin boundaries for the remainder of the City and the ETJ. Lower, Middle and Upper Greens Mill Run is planned to be completed in Fiscal Year 2014.

Section IV: Stormwater Utility Fund Analysis

Public Works and Financial Services have reviewed the current state of the Stormwater Utility Fund. In order to complete the Capital projects described in Section III, provide an increased level of operational service and create a placeholder for $3M worth of capital projects in FY17 and FY18, the stormwater equivalent rate unit (ERU) needs to be increased by $0.50 annually for 5 years. The table below depicts the 5 year requested fee increase.

Fiscal Year	Proposed Rate Increase	Proposed Monthly ERU
2014	$0.50	$3.35
2015	$0.50	$3.85
2016	$0.50	$4.35
2017	$0.50	$4.85
2018	$0.50	$5.35

The current rate of $2.85/ERU has been in place since the inception of the utility in December 2002. This fee was implemented in July 2003 to fund both operational expenses as well as capital costs as stated in the Stormwater Utility Ordinance:

SEC. 8-3-3(A) "There is hereby established a stormwater management utility...which shall provide for the management, protection, control, regulation, use and enhancement of stormwater and drainage systems."

Section V: Recommendation

After completing the Pilot Watershed Master Plan and realizing the impact of the 10th Street Connector to City infrastructure it has become apparent our needs far exceed our resources. In an effort to minimize the City's exposure to inadequate infrastructure (under sized and/or exceeding the life span) Public Works is recommending an increase in utility fee to fund debt services on revenue bonds and a shift in maintenance practices. A fee increase of $0.50/ERU is proposed annually for the next 5 years. This increase will allow Public Works to complete Watershed Master Planning throughout the City as well as complete known Capital Projects identified above in Section III Capital Expenditures/Needs.

In addition to the fee increase Public Works is also recommending the development and implementation of ordinance revisions for increased detention requirements to the 10-year storm. This requirement has the potential to save the City $ 42 Million over the next 20 years if projects are completed throughout the current ETJ.

Appendix A: Meetinghouse Branch Stormwater Master Plan Executive Summary

The City of Greenville has retained WK Dickson to complete a Master Plan for the Meetinghouse Branch and Bells Branch watersheds. The goals of this master plan include: (1) evaluate the watershed for existing flooding, water quality, and erosion problems, (2) recommend and prioritize capital improvements to control existing flooding by reducing the frequency and severity of flooding for property owners, and (3) identify stream stabilization projects to reduce the risk of property loss along streams and to reduce sediment loads as a result of erosion. To assist in achieving the goals listed above, WK Dickson also completed a stormwater drainage infrastructure inventory for drainage structures and features within the Meetinghouse Branch and Bells Branch watersheds. Over 1,200 drainage structure and approximately 18 miles of drainage pipes were located and incorporated in a GIS database as part of this effort.

The project included a broad range of stakeholders to collect as much data, information and tacit knowledge of the watershed as feasible. The general public was solicited through questionnaires mailed to all property owners in the watershed and through an open house public meeting where residents and business owners were encouraged to provide feedback on stormwater issues in the watershed. Information collected from the questionnaires and public meeting can be found in Section 2.1 and Appendix D. As part of the Meetinghouse Branch Watershed Master Plan the City of Greenville also partnered with the Pamlico-Tar River Foundation (PTRF) and East Carolina University (ECU) to identify erosion and water quality problems in the Meetinghouse Branch Watershed and to develop potential solutions to those problems. The sharing of information between the City and PTRF resulted in cost savings for both organizations and continued partnering will enable the City to continue to leverage other revenue sources for the improvement of water quality throughout the Meetinghouse Branch watershed and overall city boundary. Pertinent sections of the PTRF report for the Meetinghouse Branch watershed are included in Appendix N. Finally City personnel served as a critical stakeholder by providing valuable information on historical flooding and erosion problems in the watershed as well as providing feedback on potential capital improvements and the prioritization of those improvements.

The project watershed is approximately 3 square miles and is located in the eastern portion of Greenville just south of the Tar River. The watershed is generally bound by Charles Blvd to the west, Greenville Blvd and Red Banks Rd to the northwest and 10th St to the north. The Meetinghouse Branch watershed was selected by the City as the first watershed plan in the City as the stormwater issues in this watershed are generally representative of the stormwater issues citywide.

WK Dickson conducted an Existing Conditions Analysis in order to evaluate the existing hydrologic and hydraulic characteristics of the Meetinghouse Branch and Bells Branch watersheds. Noted in this report as the Primary System, Meetinghouse Branch and Bells Branch were hydraulically studied in detail based on historical flooding of residential areas and roadways. Furthermore, high storm flows have eroded channel banks over time causing impacts to private yards, fences, and other property improvements. In addition to the Primary Systems, select conveyance systems that drain to Meetinghouse Branch and Bells Branch were analyzed to determine if those systems met the desired City design requirements outlined in Section 1.2. Those Secondary Systems were identified based on feedback from public residents and City personnel.

As a result of the Existing Conditions Analysis, multiple capital projects were identified to reduce the severity and frequency of flooding, stabilize stream banks, and improve water quality through stormwater treatment practices. The proposed capital projects are as follows with the locations of each project shown in Figure ES-1:

Flood Control Projects

Bells Branch Primary System

East 14th Street – The 48" corrugated metal pipe (CMP) culvert at this crossing is in poor condition and is providing between a 2- and 10-year level of service. Consequently, it is recommended that this culvert be replaced. The recommended alternative includes replacing the existing culvert with twin 42" reinforced concrete pipe (RCP) and providing the desired 50-year level of service. Additional alternatives including floodplain benching were investigated at this location, but the other alternatives did not provide significant cost savings or increased benefits.

York Road/Railroad Crossing – The York Road and Railroad Crossing were combined into one project because the backwater caused by the railroad crossing impacts the York Road culvert. Therefore to maximize the effectiveness of the proposed project, both crossings should be addressed together.

The 60" CMP at York road provides between a 10-year level of service. The 60" RCP located at the railroad provides a 50-year level of service. The desired level of service for York Road and the railroad are the 25-year and 100-year storms respectively. Alternative 1 for this location would include replacing the existing culvert at York Road with a 72" RCP and providing no improvements at the railroad. The 25-year level of service would be provided at York Road and the railroad would continue to operate at a 50-year level of service.

Alternative 2 for this location would include replacing the existing culvert at York Road with a 72" RCP and installing a 30" steel floodplain culvert at the railroad crossing with the existing culvert to remain in place. To maintain rail service for the duration of the project, it is assumed the floodplain culverts would be installed using tunneling techniques such as jack and bore. This alternative would provide a 50-year level of service at York Road and a 100-year level of service at the railroad. Additionally this alternative would provide additional flood protection to floodprone residences along York Road and Glenn Court that have reported finished floor flooding in the past.

Oxford Road – The closed system located at the downstream end of Bells Branch is undersized. It is currently operating below a 2-year level of service. Portions of the system are in poor condition requiring the City to perform frequent maintenance due to the formation of sinkholes in the right-of-way. Until the system is replaced the potential for sinkhole formation will remain which will result in a public safety hazard to motorists and residents in the area. It is proposed that the existing 60" CMP be replaced with 7' x 5' reinforced concrete box culvert (RCBC) to provide the desired 10-year level of service.

Meetinghouse Branch Primary System

Charles Boulevard – The twin 48" CMP at this crossing is in good condition and is currently providing a 25-year level of service. Since Charles Boulevard is a major thoroughfare the desired level of service is the 50-year storm, however construction of a larger culvert at this location would be difficult due to the high traffic volume at this location. Alternative 1 is a no action option with monitoring of flood conditions during significant storm events. While the desired level of service would not be met, City funds could be reallocated to other areas with more significant flooding issues.

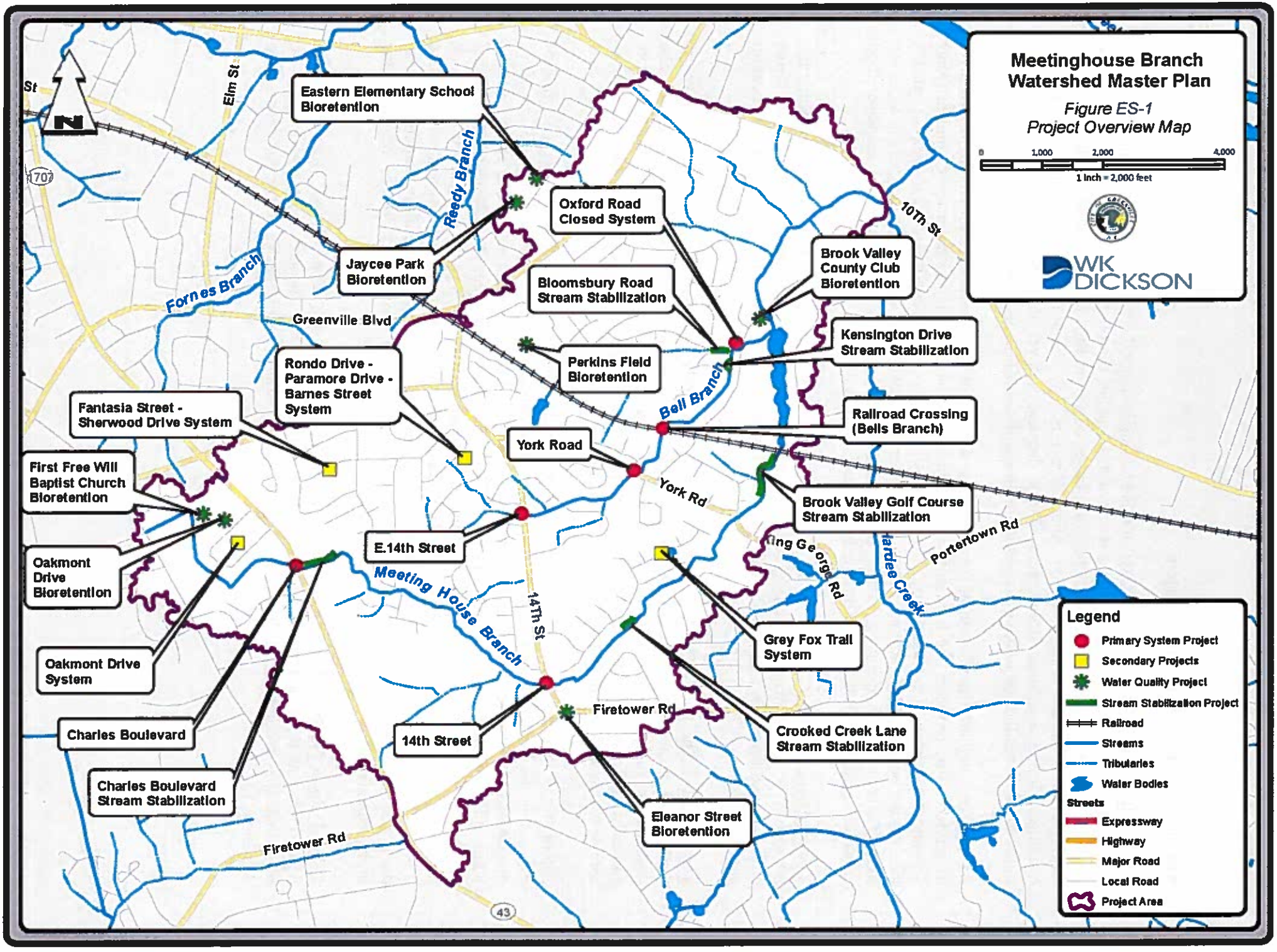
Alternative 2 includes installation of two additional 48" floodplain culverts. To provide a 50-year level of service at the crossing and to significantly reduce water surface elevations in the Colindale Court Townhomes located immediately upstream of the culverts. In existing conditions 32 townhomes at this location are potentially floodprone during the 25-year storm event. At a minimum the parking areas are likely flooded on a frequent basis. The proposed Alternative 2 improvements would decrease flood elevations upstream of the culvert during the 25-year storm by 1.4 feet.

Tucker Drive – The 60" and 72" CMP at this crossing is in good condition with the exception that the 60" culvert is approximately 50% filled with sediment. If the culvert is cleaned out then Tucker Drive crossing would provide a 25-year level of service. Therefore, no capital improvements at this location are proposed.

14th Street – The twin 60" CMP at this crossing is currently providing less than a 2-year level of service and is in poor condition. Consequently, it is recommended that this culvert be replaced. The desired level of service at this location is the 50-year storm, however due to high flows, limited space, and existing erosion concerns downstream the proposed alternatives both provide a 25-year level of service which will significantly reduce flooding at this location.

Alternative 1 includes replacing the existing culvert with twin 11' x 6' RCBC. This is a significant increase in the capacity of the culvert which could be a concern since there are existing erosion issues downstream. Alternative 2 was developed to minimize the proposed culvert size to the extent possible while still providing a 25-year level of service. To reduce the culvert size, the tailwater at 14th Street will be lowered by grading floodplain benches downstream of 14th Street in the right and left overbank for approximately 1,300 feet. With the floodplain benches installed the proposed culvert for Alternative 2 is a twin 9' x 5' RCBC that would provide a 25-year level of service when built in conjunction with the floodplain bench. The size of the culvert for Alternative 2 is approximately 70% of the size of the proposed culvert for Alternative 1.

Oxford Road North – The existing bridge at the northern crossing along Oxford Road meets the desired 25-year level of service. However during a routine NCDOT inspection, several issues were identified. It is recommended that issues be resolved as outlined in the bridge inspection report (See Appendix L).


Meetinghouse Branch
Watershed Master Plan
Figure ES-1
Project Overview Map
0
1,000
2,000
4,000
1 Inch = 2,000 feet
WK DICKSON
Eastern Elementary School Bioretention
Oxford Road Closed System
Jaycee Park Bioretention
Bloomsbury Road Stream Stabilization
Brook Valley County Club Bioretention
Kensington Drive Stream Stabilization
Perkins Field Bioretention
Rondo Drive - Paramore Drive - Barnes Street System
Fantasia Street - Sherwood Drive System
Railroad Crossing (Bells Branch)
York Road
First Free Will Baptist Church Bioretention
Brook Valley Golf Course Stream Stabilization
E.14th Street
Oakmont Drive Bioretention
Grey Fox Trail System
Oakmont Drive System
Crooked Creek Lane Stream Stabilization
14th Street
Charles Boulevard
Charles Boulevard Stream Stabilization
Eleanor Street Bioretention
Elm St
Reedy Branch
Fornes Branch
Greenville Blvd
Bell Branch
York Rd
10Th St
Portertown Rd
Meeting House Branch
14Th St
Firetower Rd
Legend
Primary System Project
Secondary Projects
Water Quality Project
Stream Stabilization Project
Railroad
Streams
Tributaries
Water Bodies
Streets
Expressway
Highway
Major Road
Local Road
Project Area

Secondary Systems

Grey Fox Trail System – The majority of the system is operating below a 10-year level of service. Therefore, the proposed improvements include upsizing the existing pipe system along Grey Fox Trail to the outlet at Meetinghouse Branch. The proposed pipe improvements range in size from 24" RCP to 36" RCP.

Barnes Street – Paramore Drive – Rondo Drive System – The lower section of this system is performing at a 2-year level of service caused partially by backwater from Bells Branch. The improvements for this system focused on the portion of the system downstream of Paramore Drive to the outfall. The proposed improvements will provide a 10-year level of service taking into account the backwater from Bells Branch. Proposed pipe improvements range in size from 42" RCP to 48" RCP.

Fantasia Street – Sherwood Drive System – The existing conveyance system does not provide a 10-year level of service. A significant portion of the drainage system is currently located in backyards between Sonata Street and Rondo Drive. The proposed improvements will include new pipes and inlets along Sonata Street, Tucker Drive, and Fantasia Street to direct runoff to a conveyance system with City right-of-way which will more easily facilitate future maintenance of the system. Proposed pipe improvements range in size from 15" RCP to 48" RCP. In some locations with limited cover, twin 24" RCP's are proposed.

Oakmont Drive System – This system is operating below a 2-year level of service. Local business owners have reported frequent flooding of parking lots and occasional finished floor flooding. The existing conveyance system is located in close proximity to businesses. Therefore, the proposed pipe improvements ranging in size from 24" RCP to 48" RCP may require vertical trenching due to space constraints.

Flood Control Prioritization

To appropriately allocate City resources, the flood control projects listed above were prioritized based on the following categories as described in Appendix M:

- Public health and safety;
- Severity of street flooding
- Cost effectiveness
- Effect of improvements
- Water quality – BMP
- Open Channel – erosion control
- Implementation constraints
- Grant funding
- Constructability
-

Scores were assigned to each project for the factors listed above to determine the priority list. In some instances project prioritization will be impacted by the required sequencing of projects to provide the highest possible flood reduction benefits and to reduce or negate any downstream

impacts from the proposed projects. While both alternatives are shown for some projects, it is acknowledged that only one of the two alternatives would need to be constructed. Once an alternative has been selected, the remaining alternative for the same project can be removed from the prioritization list. Table ES-1 shows the proposed prioritizations and conceptual cost estimates for the Flood Control Improvements. The City should re-visit the prioritization lists annually to determine if the priorities should change. The prioritization scoring for each project and a description of the aforementioned categories is included in Appendix M. The total cost for Alternative 1 improvements and the secondary system improvements is approximately $7 Million. As noted above in some instances Alternative 1 does not result in the desired level of service. The total cost for Alternative 2 improvements and the secondary system improvements is approximately $8 Million. With the exception of 14th Street in Meetinghouse Branch the Altemative 2 improvements result in the desired level of service.

TABLE ES-1: Flood Control Prioritization

Prioritization	Project	Cost
1	Oxford Road Closed System (Bells Branch)	$1,423,000
2	York Road and Railroad Crossing (Bells Branch) - Alternative #2	$278,300
3	14th Street (Meetinghouse Branch - Alternative #1	$553,200
4	East 14th Street (Bells Branch) - Alternative #2	$224,900
5	14th Street (Meetinghouse Branch - Alternative #2	$1,187,700
6	York Road and Railroad Crossing (Bells Branch) - Alternative #1	$183,600
7	Oakmont Drive	$490,400
8	Grey Fox Trail	$848,500
9	Charles Boulevard (Meetinghouse Branch) - Alternative #2	$212,800
10	East 14th Street (Bells Branch) - Alternative #1	$159,100
11	Fantasia Street - Sherwood Drive	$1,760,600
12	Barnes Street - Paramore Drive - Rondo Drive	$536,800
*	Eastwood Drainage System	$1,100,000

*Eastwood Drainage System is located in the Project Watershed, but has been designed by others and is not included in the Prioritization Ranking. The estimated project cost for the Eastwood Drainage System was provided by City personnel.

Stream Stabilization and Water Quality Projects

During the Existing Conditions Analysis, the majority of streams were quantitatively assessed for stability. Based on this assessment five (5) stream stabilization projects were identified as shown in Figure ES-1. Potential components of the stabilization projects include, flattening the slope of the channel banks, installing erosion control matting and plantings, rock grade control structures, log grade control structures, retaining walls, and riprap. The stabilization projects will protect residential yards, fences, and structures from further erosion, and substantially decrease the instream sediment loads to downstream receiving waters.

In addition to the stream stability projects, water quality BMP retrofit projects were also identified. Potential project locations were initially identified using available GIS data by focusing on locations with contributing drainage areas that are highly impervious and ideally on publically owned land. Impervious areas typically generate the highest concentration of

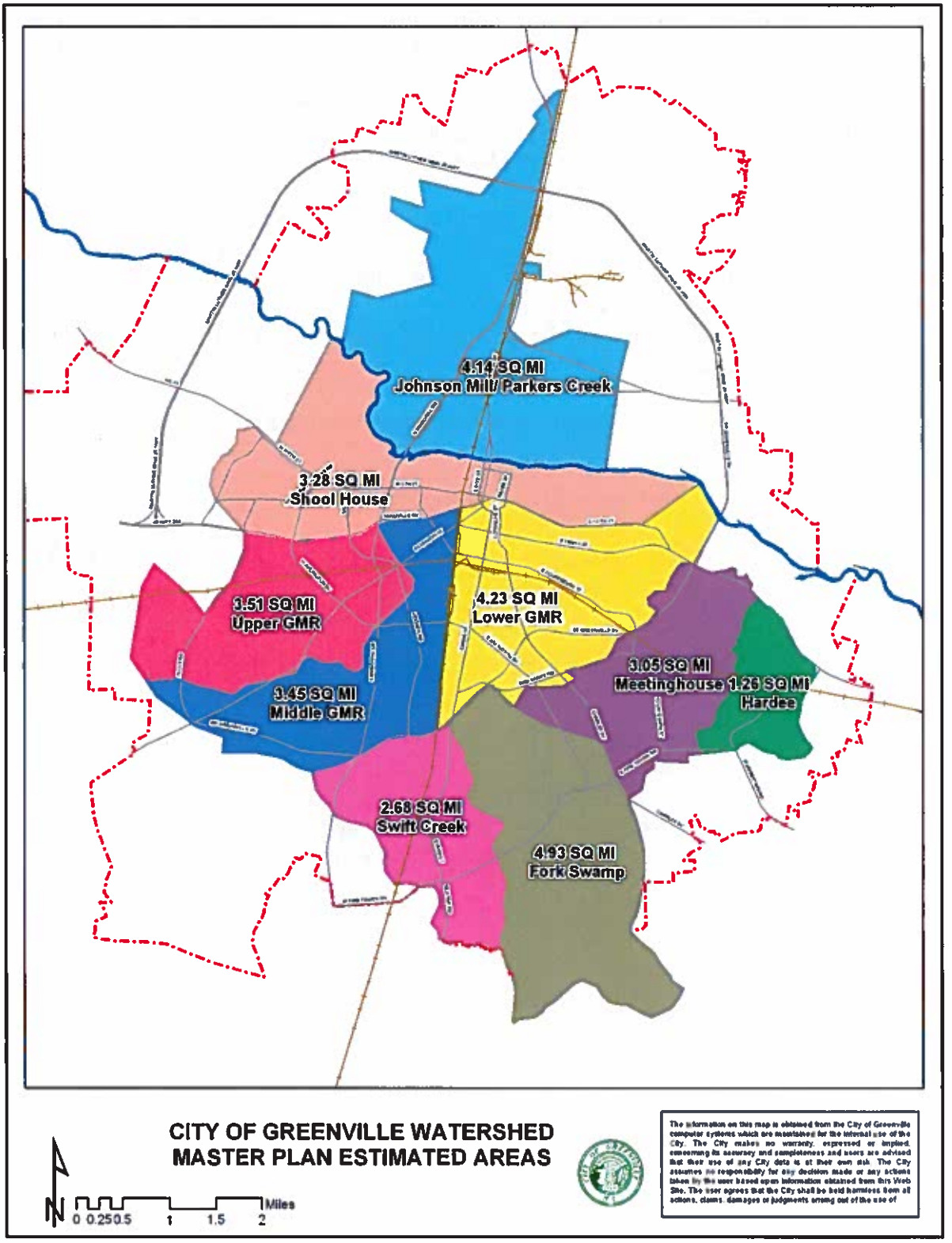
pollutants, so treating the runoff from these areas would provide more pollutant material than treating water that carried fewer pollutants. Publically owned land is ideal for BMP retrofits to reduce or eliminate potential land acquisition costs. See Section 5.2 for additional evaluation criteria for BMP retrofit sites. Potential locations that were identified using GIS were then inspected to determine if the site conditions were conducive to a BMP. This inspection typically included verifying that GIS data and aerial photography were accurate and current and to determine if there were project constraints present that may not be visible from GIS data, such as utility conflicts, private property conflicts or limited access to the site. If possible, retrofit projects were located on public property to reduce any potential land acquisition costs.

The stream stabilization projects and water quality retrofit projects were prioritized using similar categories to the flood control projects as described above and are located in Appendix M. Cost effectiveness for stream stabilization projects was calculated based on a cost per linear foot of stabilized stream. Cost effectiveness for water quality retrofit projects was calculated based on a cost per impervious acre treated. Table ES-2 shows the prioritization of the Stream Stabilization and Water Quality projects along with preliminary cost estimates.

Table ES-2: Water Quality and Stream Stabilization Prioritization

Prioritization	Project	Cost
1	Charles Boulevard Stream Stabilization	$114,700
2	Perkins Field - Bioretention	$90,500
3	Eastern Elementary School - Bioretention	$80,200
4	Oakmont Drive - Bioretention	$41,200
5	Brook Valley Golf Course Stream Stabilization	$116,500
6	Bloomsbury Road Stream Stabilization	$54,000
7	Crooked Creek Road Stream Stabilization	$69,300
8	Jaycee Park - Bioretention	$151,100
9	Brook Valley Country Club - Bioretention	$55,500
10	Eleanor Street - Bioretention	$57,500
11	Kensington Drive Stream Stabilization	$172,400
12	Free First Baptist Church - Bioretention	$82,900

Appendix B: Drainage Basin Boundaries for Future Master Plans



Appendix C: Survey of Utility Fees and Design Standards from Other Municipalities

Select municipalities were reviewed to determine stormwater detention requirements and stormwater utility fees as detailed in the following summaries.

Storage and Detention

A review of the top 15 cities in North Carolina based on population revealed Greenville is the only City that does not require at least the 10-year event to be detained and released at pre-development rates. Chapel Hill and Winston-Salem have a 25-year requirement and the other twelve municipalities have a 10-year requirement.

Most municipalities require their stormwater detention ponds to be designed such that the peak discharge from post-development in the 10-year storm shall not exceed the pre-development peak discharge. There is a trend in municipalities attenuating peak flows for the more frequent storms (2 and 5 year storms) in addition to the 10 or 25 year storm to help reduce future channel erosion and improve water quality. Table 1 highlights development requirements for the municipalities of interest.

Table 1: Storage and Detention

Town or City	Storm Events	Other Considerations
Charlotte	2- and 10-year frequency, 6-hour duration	Must achieve 6-inches of freeboard with 50-year in design of emergency spillway ; Must drain within 72 hours
	Emergency spillway designed for 50-year, 6-hour duration	
Fayetteville	1- and 10-year frequency	25-year frequency for watersheds with well documented flooding issues
Greenville	1-year frequency, 24-hour duration	Not required if less than a 10% increase in peak flow
Raleigh	10-year frequency, 24-hour duration	Evaluation for downstream flooding must extend downstream until the drainage area being evaluated is less than 10% of the total drainage area
Rocky Mount	1- , 10- and 25-year frequency, 24-hour duration	Not required if less than 15% impervious surface or less than a 10% increase in peak flows
Wilmington	2- and 10-year frequency	Must achieve 6-inches of freeboard with 50-year in design of emergency spillway ; Must drain within 2 to 5 days
	Emergency spillway designed for 50-year event	

Stormwater Utility Fees

The six largest municipalities that were studied are: Charlotte, Raleigh, Greensboro, Durham, Winston-Salem, and Fayetteville. These cities had a population of over 100,000 in 1990 when Phase I of the NPDES permits were put into place. They were therefore the first cities required to have a stormwater management plan. Because these programs have been in place as much as ten years longer than the programs created in Phase II of the NPDES permits, results are presented here are divided by Phase I cities and Phase II cities and towns.

Table 2: Collected Residential Stormwater Utility Fee Rate Data for Phase I Cities[1]

Municipality	2008 Population Estimate	Residential Fee Structure		Monthly Fee for Average Property	Rate Structure Last Updated
		tier break downs	fee/year		
Charlotte	683,541	4 tiers base on impervious area:		$10.06	Unknown
		<2,000 sq. ft	$80.40		
		2,000-2,999 sq. ft	$114.36		
		3,000-4,999 sq ft.	$120.72		
		>5,000 sq. ft.	$135.48		
Raleigh	377,353	5 tiers based on impervious area:		$4.00	2008
		400-1,000 sq. ft.	$19.20		
		1,001-3,870 sq.ft.	$48.00		
		3,871-6,620 sq. ft.	$81.60		
		6,621-9,500 sq.ft.	$139.20		
		>9,500 sq.ft.	$201.00+		
Greensboro	263,268	3 tiers based on impervious area:		$2.70	2004
		600-1,999 sq. ft.	$18.00		
		2,000-2899 sq.ft.	$32.40		
		2,900 sq.ft. +	$46.80		
Durham	228,480	3 tiers based on impervious area:		$4.92	2010
		<2,000 sq. ft.	$28.44		
		2,000-4,000 sq. ft.	$59.04		
		>4,000 sq. ft	$118.08		
Winston-Salem	228,362	4 tiers base on impervious area:		$4.50	2007
		1-2,000 sq.ft.	$51.00		
		2,001-4,000 sq.ft.	$54.00		
		4,001-6,000 sq. ft.	$81.00		
		>6,000 sq. ft.	$108.00		
Fayetteville	181,481	each property is billed a flat rate of $36.00/year ($3.00/month)		$3.00	2007
Average	**327,081**	**n/a**		**$4.56**	**2008**

[1]"A Study of Stormwater Utility Fees in Select North Carolina Municipalities" prepared by Abigail Ferrance-Wu, Pollution Prevention Coordinator, City of Durham, July 2010. Updated by Kinsey Holton, PE, Civil Engineer II, City of Greenville

Table 3: Collected Residential Stormwater Utility Fee Rate Data for Phase II Cities[1]

Municipality	2008 Population Estimate	Residential Fee Structure		Monthly Fee for Average Property	Rate Structure Last Updated
		tier break downs	fee/year		
Wilmington	101,526	each property is billed a flat rate of $73.08/year ($6.09/month)		$6.09	Unknown
High Point	100,645	each property is billed a flat rate of $24.00/year ($2.00/month)		$2.00	2007
Jacksonville	81,873	each property is billed a flat rate of $60.00/year ($5.00/month)		$5.00	Unknown
Greenville	**81,092**	**4 tiers based on impervious area:**		**$5.70**	**2002**
		200-2,000 sq.ft.	**$34.20**		
		2,001-4,000 sq. ft.	**$68.40**		
		4,001-6,000 sq.ft	**$102.60**		
		>6,000 sq. ft.	**$136.80**		
Concord	79,264	3 tiers based on impervious area:		$4.30	2007
		401-1,899 sq. ft.	$30.96		
		1,890-5,507 sq. ft.	$51.60		
		>5,507	$92.88		
Asheville	78,313	each property is billed a flat rate of $28.08/year ($2.34/month)		$2.34	2005
Gastonia	74,518	each property is billed a flat rate of $33.00/year ($2.75/month)		$2.75	2002
Rocky Mount	59,228	each property is billed a flat rate of $51.00/year ($4.25/month)		$4.25	Unknown
Chapel Hill	55,616	bill based on 2,000 sq foot ERUs		$6.50	2004
Burlington	50,927	each property is billed a flat rate of $24.00/year ($2.00/month)		$2.00	2005
Wilson	50,643	each property is billed a flat rate of $35.28/year ($2.94/month)		$2.94	2002
Average	**73,968**	**n/a**		**$3.76**	**2005**

[1]"A Study of Stormwater Utility Fees in Select North Carolina Municipalities" prepared by Abigail Ferrance-Wu, Pollution Prevention Coordinator, City of Durham, July 2010. Updated by Kinsey Holton, PE, Civil Engineer II, City of Greenville

Table 4: Collected Commercial Stormwater Utility Fee Rate Data for Phase I Cities[1]

Municipality	2008 Population Estimate	Commercial Fee Structure (rates/month)	Monthly fee/1000 square feet	Rate Structure Last Updated
Charlotte	683,541	$145.55/acre of impervious area	$3.34	Unknown
Raleigh	377,353	$4.00 per ERU of 2,260 square feet	$1.77	2008
Greensboro	263,268	$2.70 per ERU of 2,543 square feet	$1.06	2004
Durham	228,480	$4.92 per ERU of 2,400 square feet	$2.05	2010
Winston-Salem	228,362	$69.25/acre of impervious area	$1.59	2007
Fayetteville	181,481	$3.00 per ERU of 2,266 square feet	$1.32	2007
Average	327,081	n/a	$1.77	2008

[1]"A Study of Stormwater Utility Fees in Select North Carolina Municipalities" prepared by Abigail Ferrance-Wu, Pollution Prevention Coordinator, City of Durham, July 2010. Updated by Kinsey Holton, PE, Civil Engineer II, City of Greenville

Table 5: Collected Commercial Stormwater Utility Fee Rate Data for Phase II Cities[1]

Municipality	2008 Population Estimate	Commercial Fee Structure (rates/month)	Monthly fee/1000 square feet	Rate Structure Last Updated
Wilmington	101,526	$6.09 per ERU of 2,500 square feet	$2.44	Unknown
High Point	100,645	$2.00 per ERU of 2,588 square feet	$0.77	2007
Jacksonville	81,873	$5.00 per ERU of 2,850 square feet	$1.75	Unknown
Greenville	**81,092**	**$2.85 per ERU of 2,000 square feet**	**$1.43**	**2002**
Concord	79,264	$4.30 per ERU of 3,120 square feet	$1.38	2007
Asheville	78,313	$2.34 per ERU of 2,442 square feet	$0.96	2005
Gastonia	74,518	$2.75 per ERU of 2,650 square feet	$1.04	2002
Rocky Mount	59,228	$4.25 per ERU of 2,519 square feet	$1.69	Unknown
Chapel Hill	55,616	$6.50 per ERU of 2,000 square feet	$1.63	2004
Burlington	50,927	flat rate of $24.00/year ($2.00/month)	$2.00	2005
Wilson	50,643	$2.94 per ERU of 2,585 square feet	$1.14	2002
Average	73,968	n/a	$1.39	2005

[1]"A Study of Stormwater Utility Fees in Select North Carolina Municipalities" prepared by Abigail Ferrance-Wu, Pollution Prevention Coordinator, City of Durham, July 2010. Updated by Kinsey Holton, PE, Civil Engineer II, City of Greenville

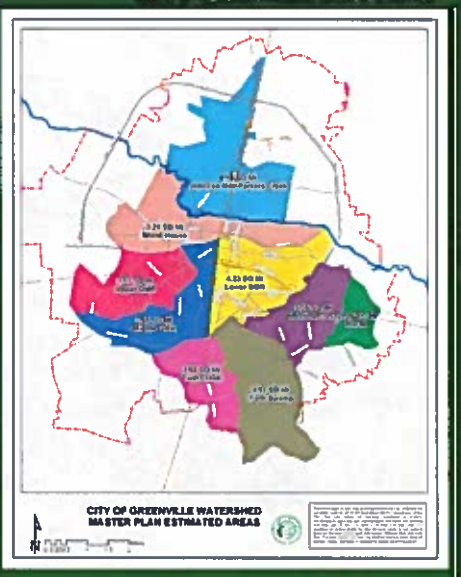
CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Agenda

- Stormwater Utility Fund
- Stormwater Management Program
- Operations vs. Capital
- Stormwater Master Planning
- Meetinghouse Branch/Bells Branch Pilot Project
- Capital Improvement Plan Projections
- Potential Impact of Ordinances on Capital Improvement Plan Costs
- Stormwater Utility Analysis

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Stormwater Watersheds



CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Stormwater Utility Fund

- Stormwater Utility Ordinance established the enterprise fund May 2001
- Intent of Fund

"SEC. 8-3-3(A) There is hereby established a stormwater management utility…which shall provide for the management, protection, control, regulation, use and enhancement of stormwater and drainage systems."

- The fee was implemented July 2003
- Fund balance June 30, 2012, $1,893,000

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Stormwater Management Program

- Funded by the Stormwater Utility
- Stormwater Management Control Ordinance Approved September 2004
  - Required per:
    - Tar-Pamlico Stormwater Rule
    - NPDES Phase II
  - Vision
    - Protect surface water quality
    - Reduce risk of flooding

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Stormwater Management Program

Components of the Program include:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Controls
- Post-Construction Site Runoff Controls
- Pollution Prevention and Good Housekeeping for Municipal Operations

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Operational Component

- Maintenance of the existing system (curb and gutter, open ditches/streams, catch basins and pipes
- Private Development Plan review
- Erosion Control Program
- Illicit Discharge Detection and Elimination Program
- Public Education and Involvement
- Inspection of Post Construction Controls (BMPs)
- Contract Management (design, construction, master planning, etc.)
- NFIP Participation and CRS

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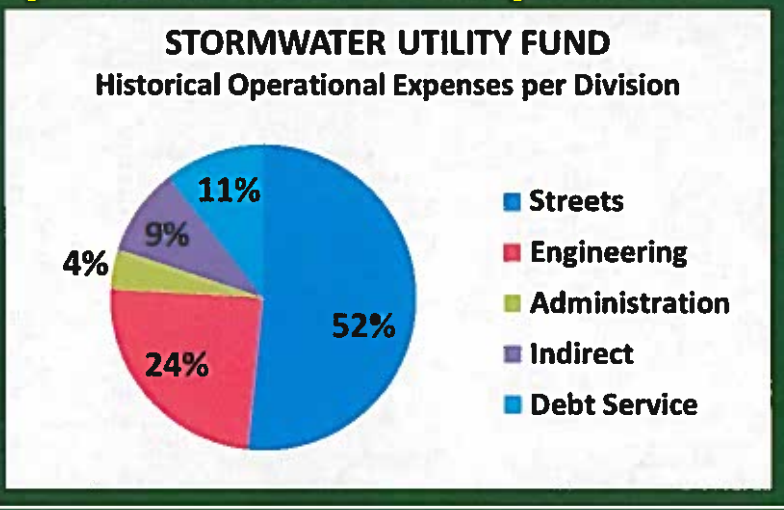
CITY COUNCIL MEETING

Operational Component



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Operational Needs

Shift in maintenance practices

- Utilize contract labor to control vegetation via herbicide treatment program

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Capital Needs (prioritized)

- City-wide Watershed Master Planning
- Town Creek Culvert
- West 5th Street (Thomas Foreman Park)
- Moyewood Pond Rehabilitation Project
- Washington Street (9th to 10th)
- Haw Drive

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Stormwater Master Planning

Multi-drainage basin, multi-year plan to evaluate flooding and water quality

- Drainage infrastructure inventory*
- Prioritized Capital Improvement Plan
- Proactive maintenance program
- Identify water quality/quantity retrofit locations*
- Educational information to public*
- Public Involvement/Participation*

*NPDES Permit Requirements

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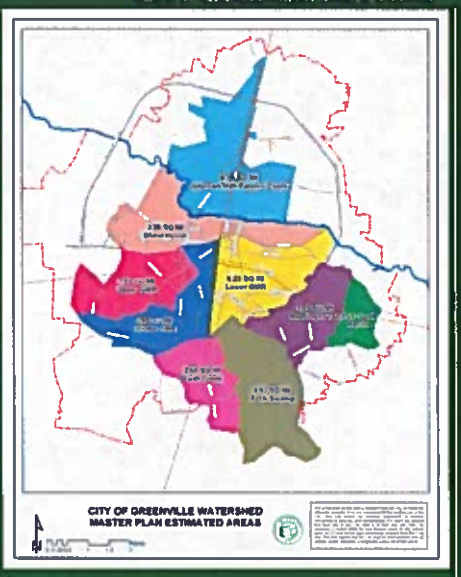
Stormwater Master Planning



CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Pilot Watershed Master Plan

- Meetinghouse Branch/Bells Branch watershed in eastern Greenville selected for Pilot
- Pilot watershed is representative of stormwater issues throughout City
- Watershed area (3 sq miles) is 8.5% of existing City limits (35 sq miles) and 5% of City Limits and ETJ (67 sq miles)

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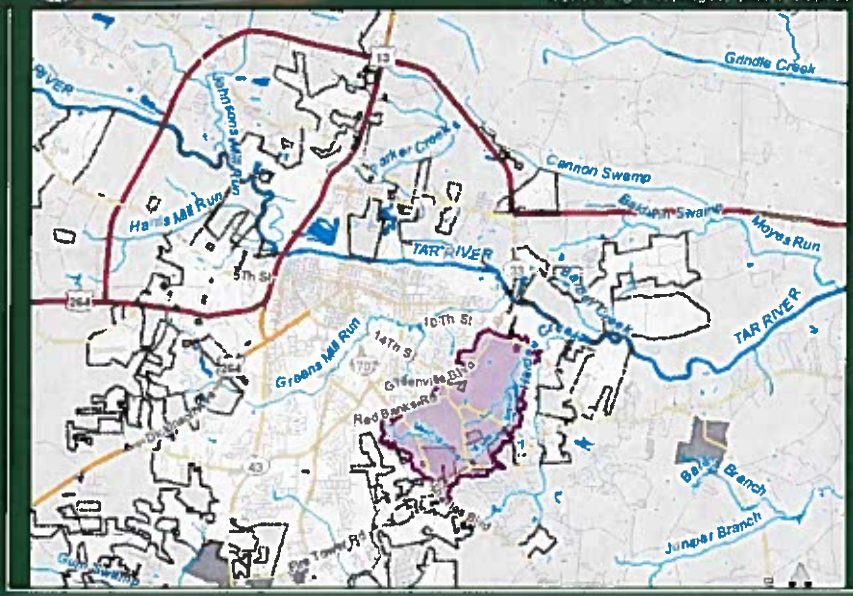
CITY COUNCIL MEETING



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CITY COUNCIL MEETING

Level of Service

Levels of Service were established for conveyance:

Piped collection systems - 10 yr storm event
Non-thoroughfare roadways - 25 yr storm event
Thoroughfare roadways - 50 yr storm event
Railroad Crossings - 100 yr storm event

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Capital Improvement Plan

Planning level conceptual construction costs (2013 dollars)

- Flood control projects – **$ 8 Million (CONVEYANCE)**
  - Culvert replacements
  - Floodplain benching
  - Closed pipe system improvements
- Stream stabilization projects – **$ 0.5 Million**
- Water quality retrofits – **$ 0.5 Million**
  - Ponds, wetlands, or bioretention (rain gardens)

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Capital Plan Benefits

- Reduced level of structure flooding for approximately 80 residential homes and 10 businesses
- Reduction of yard flooding at approximately 125 residences
- Yellow structures would be removed from 25-year floodplain

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Capital Plan Benefits

- Reduced level of flooding at 7 major road crossings and 1 railroad crossing
- Reduced level of flooding at 11 secondary (residential) streets
- Stream stabilization projects protect over 2,000 linear feet of stream and 17 properties

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Capital Plan Projections

If projected capital costs are extrapolated from the Pilot Watershed to the entire City and ETJ the total CIP would be:

Projects	City Limits	City Limits and ETJ
Flood Control	$ 96M	$ 181M
Stream Stabilization	$ 6M	$ 11M
Water Quality Retrofits	$ 6M	$ 11M

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CITY COUNCIL MEETING

What can be done to reduce costs?

- Flood control projects are driving the cost of the CIP
- Pilot watershed is fully developed, but other areas in the City are not yet fully developed
- Citywide master planning can identify areas sensitive to flooding before watersheds are fully developed
- Detention ordinances could reduce the impact of development on flooding.

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CITY COUNCIL MEETING

Detention Ordinances

- Greenville currently has ordinances to treat stormwater runoff for smaller frequent storm events to improve water quality of runoff
- Of the 15 largest communities in NC, Greenville is the only community to not have some type of detention ordinance for larger storm events (10-year event)
- Winston-Salem and Chapel Hill require detention for the 25-year event

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CITY COUNCIL MEETING

Potential Impact of Detention Ordinances

Pilot watershed modeled assuming development was required to detain the 10-year storm event to pre-development conditions

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Potential Benefits

- Water surface elevations along Meetinghouse Branch and Bells Branch decreased on average 1.2 feet during the 25-year storm when compared to existing conditions
- Yellow structures would be removed from 25-year floodplain

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CITY COUNCIL MEETING

Detention Impacts to Capital Plan

Description	Area (sq. miles)	Reduced Cost	Potential Savings
Pilot Basin	3	$ 8M	NA
City Limits	35	$ 90M	$ 6M
City Limits & ETJ	67	$ 139M	$ 42M

- In detention scenario for Pilot Watershed, capital improvements required to meet desired level of service for flood control would total $ 1.2M (savings of $ 6.8M)
- Detention ordinances can't help the Pilot watershed, but could potentially impact portions of the City that are not currently developed

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Development Requirements vs. Utility Fees

City or Town	Storm Event Detention	Res. Fee /1000sf	Comm. Fee /1000sf
Charlotte	25-yr	$3.35	$3.34
Fayetteville	10-yr	$3.00 flat	$1.32
Greenville	1-yr	$1.43	$1.43
Raleigh	10-yr	$1.60	$1.77
Rocky Mount	25-yr	$4.25 flat	$1.69
Wilmington	25-yr	$6.09 flat	$2.44

CITY OF GREENVILLE, NC
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Stormwater Utility Analysis

Fee Increase = $0.50/ERU
Each year for the next 5 years.

This would support a
Bond Amount = $ 18.4M

CITY OF GREENVILLE, NC
CITY COUNCIL MEETING

Stormwater Utility Analysis

This fee increase would allow the City to complete the following projects:

Projects	Estimated Cost
Watershed Master Plans	$ 2.7 M
Town Creek Culvert	$ 9 M
10th St Connector Drainage Proj	$ 0.3 M
Haw Drive	$ 0.3 M
TOTAL	$12.3

CITY OF GREENVILLE, NC
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Stormwater Utility Analysis

In addition this fee increase would support:

- $0.4M in operations to account for increased maintenance
- and $ 1.5M in capital projects each year

CITY OF GREENVILLE, NC
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Recommendation

Increase utility fee to fund:

- Debt services on Revenue Bonds needed to complete capital projects
- Shift in maintenance practices

Implement ordinance to increase detention requirements up to the 10-yr storm event

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Thank You