2018

Stormwater Utility Rate Study

Prepared by:
WK Dickson
10/30/2018

Table of Contents

List of Contributors

Storm Water Advisory Committee:

- Tom Best, Chairman SWAC – Vice Chair Pitt County Soil and Water Conservation District Board of Directors
- Drake Brinkley, Vice Chairman SWAC – Commercial Real Estate Attorney with Ward and Smith P.A.
- Donnie Brewer, PE – Consulting Engineer with Rivers and Associates
- Matt Butler – Program Director for Sound Rivers
- Michelle Clements, PE - Consulting Engineer with The East Group,
- Jon Day - President Jon Day and Associates Real Estate
- Don Edwards-Local business owner - President of University Book Exchange
- Joni Torres- Pitt County Cooperative Extension
- Beth Ward - County Commissioner
- Landon Weaver - Land Development Manager with Bill Clark Homes
- Cassius Williams – State Farm Insurance, National Association of Insurance & Financial Advisors

City of Greenville Staff:

- Kevin Mulligan, Director of Public Works
- Lisa Kirby, Senior Engineer, Public Works
- Daryl Norris, Civil Engineer II, Public Works
- Ronnie Donley, Streets Superintendent, Public Works
- Amanda Braddy, Administrative Assistance, Public Works
- Jordan Anders, Communications Technician, City Manager's Office

Consultants:

- Tom Murray, Senior Project Manager, WK Dickson
- Mark Senior, Senior Project Engineer, WK Dickson
- Keith Readling, Executive Vice President, Raftelis
- Katie Cromwell, Senior Consultant, Raftelis
- Inga Kennedy, President, PEQ

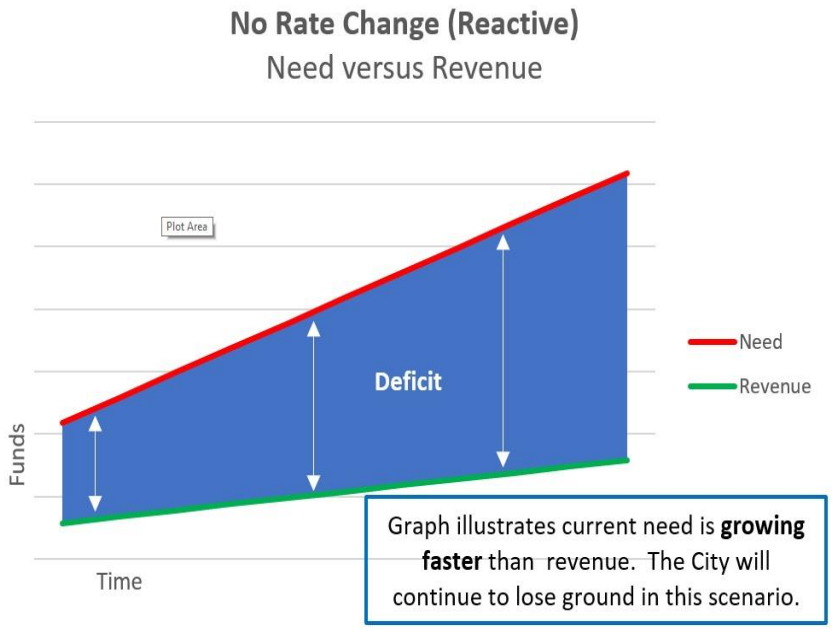
STORMWATER UTILITY RATE STUDY SUMMARY REPORT 8/31/2018

Executive Summary –

In late 2016 the Greenville City Council directed the development of a stakeholders' group to analyze and recommend improvements to the City's Stormwater Program and its funding mechanism with the goal of developing a sustainable stormwater program for the City of Greenville. The establishment of this stakeholder's group was a natural outgrowth of the City's forward-thinking Watershed Master Planning process, the results of which were presented to the City Council on August 25, 2016.

The Master Plans took a holistic look at the City's drainage basins and stormwater management program to identify current and future needs both in terms of infrastructure and programming to reduce the severity, duration, and frequency of flooding, stabilize streambanks, and provide water quality treatment for impaired watersheds. The total implementation cost identified in the Master Plans for capital projects is approximately $170 Million in 2016 dollars. Additionally, the City will be required to replace aging infrastructure nearing the end of its design life. Staff currently estimates the maintenance cost to replace this infrastructure over a 40 – 50 -year timeframe is approximately $230 Million. When evaluating these needs against current revenues, it became clear that there is a growing deficit that must be addressed (Figure ES 1).

Figure ES 1 Need Versus Revenue



The City of Greenville is far ahead of most of its counterparts in this regard as few if any other communities in NC have completed both an inventory of their drainage system components as well as the identification of all current capital improvement needs. While the identified costs for managing the stormwater infrastructure assets is significant, proactive systematic improvements to the infrastructure will allow the City to most efficiently budget resources, limit disruptions to the citizens due to failing infrastructure, and reduce the damage potential to other City assets and private property.

The Stormwater Advisory Committee (SWAC) was formed to represent a diverse cross section of community stakeholders. The current eleven (11) committee members are as follows:

- Tom Best – Vice Chair Pitt County Soil and Water Conservation District Board of Directors
- Donnie Brewer, PE – Consulting Engineer with Rivers and Associates
- Drake Brinkley – Commercial Real Estate Attorney with Ward and Smith P.A.
- Matt Butler – Program Director for Sound Rivers
- Michelle Clements, PE - Consulting Engineer with The East Group,
- Jon Day - President Jon Day and Associates Real Estate
- Don Edwards-Local business owner - President of University Book Exchange
- Joni Torres- Pitt County Cooperative Extension
- Beth Ward - County Commissioner
- Landon Weaver (on behalf of Bill Clark) - Land Development Manager with Bill Clark Homes
- Cassius Williams – State Farm Insurance, National Association of Insurance & Financial Advisors

The SWAC has met a total of 11 times starting in early 2017 through July of 2018. The first two meetings early in 2017 provided introductory material to the committee members regarding the City's Stormwater Program, its utility funding, and the objectives of the committee.

Meetings 3 through 11, starting in October 2017, addressed the following topics:

- Extent of Service (EOS) – Where should the City provide stormwater services?
- Level of Service (LOS) – What is the type and frequency of service the City should provide?
- Financial Analysis – Are changes to the utility rate structure and rates necessary to provide the recommended EOS and LOS.
- Capital Spending Plan - How should capital projects be prioritized?

Presentations were provided by the consultant team and City staff to educate the SWAC on the current practices and budgets of the City's Stormwater Program. Within those

presentations, the consultant team identified key areas that can impact the extent of service and level of service of the City's Stormwater Program. The SWAC then discussed those areas to develop recommendations. **Despite the stakeholders' diverse backgrounds and differing vested interests, the group unanimously supported a higher level of service. They also unanimously recommended an increase to stormwater utility fees to achieve the desired levels of service and fund the substantial CIP and infrastructure replacement needs determined necessary to ensure a sustainable stormwater program.** Specific discussion topics and recommendations from the SWAC are as follows:

Extent of Service (EOS):

1. What portion of the drainage system should the City maintain?

   SWAC members considered where the City should maintain infrastructure within the City limits. The three primary options considered were: 1) Maintain infrastructure within the right-of-way (ROW); 2) Maintain the infrastructure that conveys public water on both public and private property 3) Maintain all public and private drainage infrastructure regardless if it conveys public water.

   RECOMMENDATION

   The City should maintain the portion of the drainage system that conveys public water on both public and private property. (Unanimous vote)

2. Should the City provide service in the ETJ outside of the existing City limits?

   SWAC members considered if the City should provide stormwater services outside of the City limits in the ETJ. Currently new development in the ETJ is subject to City stormwater regulations, but the City does not provide maintenance or other stormwater services in the ETJ. Residents and business owners in the ETJ do not pay the stormwater utility fee or City taxes. The options considered included: 1) Provide no service in the ETJ; 2) Provide limited services where there is a direct benefit to the City; 3) Expand services in the ETJ similar to what is currently provided in the City.

   RECOMMENDATION

   The City should limit the maintenance of infrastructure in the ETJ, outside of City limits, to those situations where there is a direct benefit to the City and its residents. (Unanimous vote)

3. Should the City maintain private Best Management Practices (BMPs)?

   BMP's are required to manage the quantity and quality of stormwater runoff from new development. Currently maintenance of BMP's is the responsibility of the property owner although State requirements place ultimate responsibility on the City to ensure that the BMP's are maintained and functioning as designed.

RECOMMENDATION

The City should not maintain private BMPs although the consideration of exceptions in residential subdivisions may be considered in the future. (Unanimous vote)

Level of Service (LOS):

1. Should the City increase the current LOS for Stormwater Program Management and Engineering Operations?

   The SWAC and City staff evaluated the City's current LOS for Program Management and Engineering Operations and determined that based on the scoring matrix provided, the City currently provides a Level C LOS which includes limited planning, average state and federal regulatory compliance, priority program implementation with limited proactive measures.

   The SWAC evaluated leaving the LOS at Level C or increasing the LOS to either B or A. Level B LOS includes basin master planning with systematic updating, above average state and federal regulatory compliance that exceeds minimum requirements in most cases (i.e. requiring the same water quality standards in both the Tar-Pam and Neuse), and systematic program implementation. Level A LOS includes comprehensive program planning, aggressive state and federal regulatory compliance that exceeds minimum requirements in all cases, state of the art practices, and full program implementation.

RECOMMENDATION

Increase the current level of service for Stormwater Program Management and Engineering Operations to Level B to move from a reactive management to more proactive management. Anticipated improvements would include regularly scheduled Master Plan updates, detailed inspection of up to 50% of new public infrastructure, routine condition assessment of existing infrastructure (20-year return period), asset management personnel to manage repairs and replacement, and a billing clerk to manage the utility. (Unanimous vote)

2. Should the City increase the current LOS for Operation and Maintenance?

   The SWAC and City staff evaluated the City's current LOS for regular Operations and Maintenance and determined that based on the scoring matrix provided, the City currently provided a Level C LOS which includes limited routine maintenance, limited inspection-based maintenance, and a majority of reactive maintenance.

   The SWAC evaluated leaving the LOS at Level C or increasing the LOS to either B or A. Level B LOS includes fully routine and partially inspection-based maintenance. Level A LOS includes fully preventative and proactive maintenance using the most up to date equipment and practices.

   By providing more proactive maintenance, condition assessment, and asset management, component failures and associated flooding as well as property damage may be prevented and the life of the existing infrastructure extended. A more proactive approach could also result in substantial cost savings in terms of the accumulating costs of flood damage to structures, interruption of roadways and other services due to flooding. Cost savings would also be recognized by repairing as opposed to replacing infrastructure if problems can be identified earlier. The same would apply to addressing minor stream bank erosion and system clogging before they become major problems that damage public and private property.

   RECOMMENDATION

   Increase the current level of service for Operations and Maintenance to Level B which includes more routine inspection and maintenance. (Unanimous vote)

   Recommendations included doubling the number of maintenance staff which would facilitate the following routine maintenance activities:

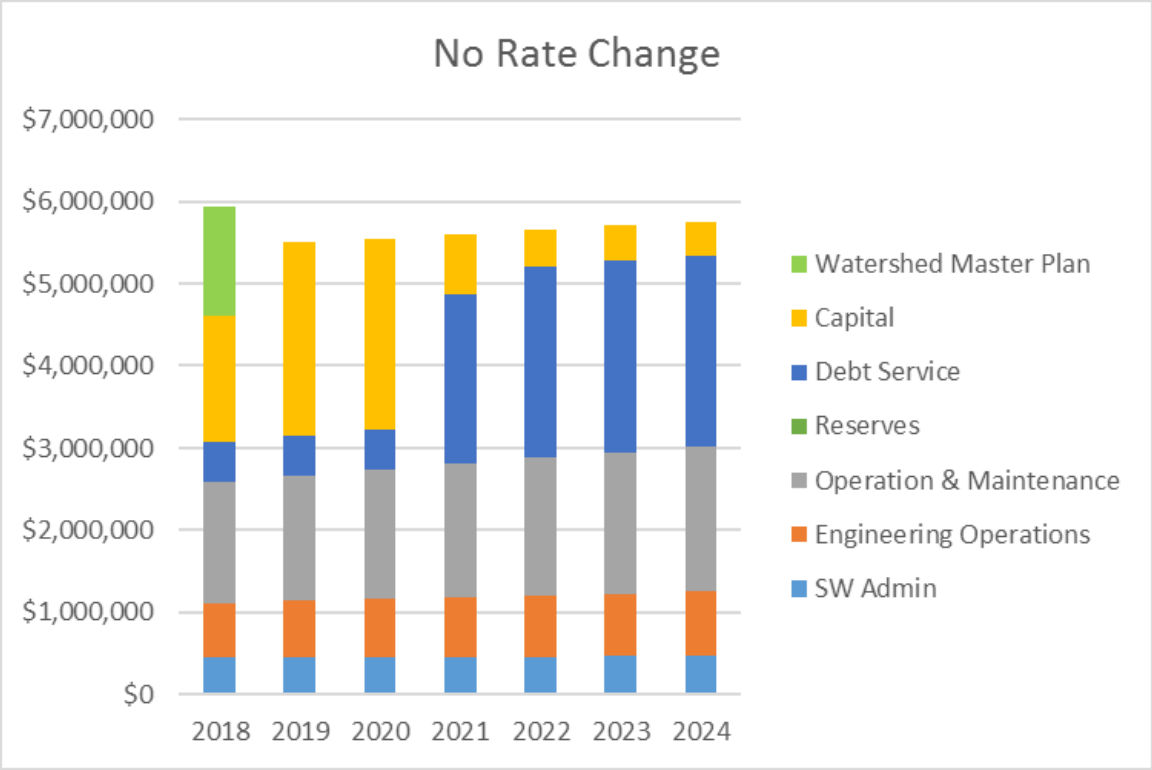
   - **Culverts cleaned/inspected twice per year;**
   - **Open channels cleaned/inspected once per year;**
   - **Catch basins cleaned/inspected once every 2.5 years;**
   - **Pipes cleaned/inspected once every 7 years.**

3. What level of capital funding should be budgeted?

   The current Capital Improvement Plan (CIP) developed during the City's Stormwater Master Plan includes projects with conceptual costs totaling approximately $170 Million. Current funding is inadequate to implement these projects as it would take over 400 years to implement all the identified projects. Figure ES 2 below shows revenue allocation for the Stormwater Utility if utility rates are unchanged from the

2018 rates. While the Watershed Master Plan will be paid for after 2018, the debt service beginning in 2021 as a result of the Town Creek Culvert project, will significantly impact new capital spending. The SWAC discussed what level of capital funding would be appropriate based on the identified needs in the Stormwater Master Plan.

Figure ES 2 Cash Flow with No Rate Change



The Stakeholders also considered that the existing infrastructure in the City is aging and will need to be rehabilitated or replaced even where no flooding is occurring. The estimated cost to replace all the existing infrastructure within the City is $230 Million. It is assumed that the majority of the City's infrastructure would need to be replaced over the next 40 to 50 years as it approaches the end of its useful life. It was estimated that 16% of the infrastructure already exceeds its expected useful life and that another 25% will near the end of its expected life in the next 10 years. There is currently no funding assigned specifically to the replacement of aging infrastructure.

RECOMMENDATION

Increase capital funding to provide a dedicated funding stream for implementing high priority projects from the City's Stormwater Capital Improvement Plan and for replacement of aging infrastructure. (Unanimous vote)

Financial Analysis:

Funding for most utilities is based on usage such as the quantity of water consumed, or the amount of electricity used. Those fees established are based on the revenues necessary to operate and maintain the systems in a sustainable manner, so the services can be provided without interruption. Like most communities, Greenville's Stormwater Utility fee is based on the amount of impervious surfaces on a property. Impervious surfaces typically generate the highest quantity of stormwater runoff as well as the most polluted stormwater runoff. Residential properties pay a fee based on a 4-tier system depending on the amount of impervious surface on their lot. The lowest tier equates to 200 to 2,000 square feet of imperious surface which is also known as an "Equivalent Rate Unit" or ERU. Fees for greater amounts of impervious area are shown in the Table ES 1.

Table ES 1 Current Stormwater Utility Fees

Tier	Impervious Area (SF)	ERU's	Monthly Fee
I	200 - 2000	1	$5.35
II	2001 - 4000	2	$10.70 (2 x base)
III	4001 - 6000	3	$16.05 (3 x base)
IV	6000+	4	$21.40 (4 x base)

The current fee for up to 2,000 square feet or one ERU is $5.35. The utility fee for commercial properties is based on dividing the total impervious area by the area of 1 ERU (2,000) and multiplying by the fee for 1 ERU ($5.35). The SWAC discussed possible modifications to how stormwater utility fees are collected and what fee is necessary to make the stormwater utility sustainable. SWAC also recognized it is vital to have a dedicated billing staff position to manage billing practices and policies. In addition, annual audits should be conducted to guarantee charges are accurate. Accordingly, a staff position was included in the LOS Stormwater Program Management and Engineering Operations discussion and will be necessary to implement the recommendations identified in items 1-3 below.

1. Should a portion of the utility bill include a fixed administrative charge for all rate payers that includes the allocable portion of the Stormwater Program costs that are independent of impervious surface? Examples of these costs include; Illicit Discharge and Elimination Program, Public Education, Permit Compliance, Billing, etc.

   The current City utility rate is based completely on the ERU and does not include a fixed administrative charge. Rate payers in multi-unit properties pay a

disproportionate utility rate which is often less than the cost of the City's Stormwater expenses that are not related to impervious surfaces.

RECOMMENDATION

Include a fixed administrative charge to all rate payers for the portion of the Stormwater Program services that is equally distributable regardless of impervious area (Estimated Revenue $518,000/year). (Unanimous vote)

2. Should multi-family units have a minimum utility rate?

   Currently there is no minimum rate for multi-family units. The SWAC evaluated having a minimum rate of either 0.5 ERU or 1 ERU in addition to the administrative charge.

RECOMMENDATION

Implement a minimum charge per unit in multi-unit buildings to one (1) Equivalent Rate Unit (ERU) (Estimated Revenue $295,000/year). (Unanimous vote)

3. Should property owners with no electric bills pay stormwater fees?

   Currently, if GUC does not send the property owner a bill for electricity, then the stormwater utility fee is not charged regardless of the amount of impervious area on the property. Examples would be parking lots, abandon buildings, etc.

RECOMMENDATION

Collaborate with GUC to identify strategies and billing practices for stormwater only rate payers (Estimated Revenue $265,000/year). (Unanimous vote)

4. Should the Stormwater Utility include reserve funds for emergencies?

   Currently the City's Stormwater Utility does not have designated reserve funds for emergencies and must reallocate funds when required in emergency situations.

RECOMMENDATION

Develop reserve fund for emergency situations including approximately $250,000 per year. (Unanimous vote)

Note: the financial plan provides for carrying a fund balance of $1,500,000 which accommodates this recommendation.

5. Should a fifth residential tier be added for ERU billing capturing residential properties with an impervious area over 8,000 sq. feet?

   Currently, the City of Greenville has four residential tiers. Most residential properties fall into Tier II. The SWAC considered adding a 5th tier for properties exceeding 8,000 sq. feet but determined that the cost to establish and administer an additional tier would not justify the limited revenue generated which was estimated at $14,000 per year.

   RECOMMENDATION

   The SWAC recommended to not add a fifth residential tier for ERU billing due to the limited increase in revenue from making this change. (Unanimous vote)

6. Should the City increase the ERU rates to fund the recommendations for increased EOS and LOS as well as provide increased capital funding to ensure a sustainable program?

   The SWAC considered various levels of capital funding. Specifically, adding $2 Million, $4 Million, or $6 Million per year to the capital funding budget. It was demonstrated that at current funding levels, it would take over 400 years to complete all the identified CIP projects, close to 600 years to replace the aging infrastructure, and over 1,000 years to accomplish both tasks. At the $2 million funding level it would take over 200 years to complete both tasks and at the $6 million funding level it would take close to 67 years. None of these scenarios include inflation or consider that already replaced components of the drainage system would have aged-out and need to be replaced again before all the older portions of system could be replaced the first time.

   RECOMMENDATION

   Increase ERU rates to meet EOS and LOS recommendations and provide additional capital funds to ensure a sustainable program. The targeted additional capital fund amount is $6,000,000 annually. (Unanimous vote)

   Note: See the rate table below item 7 for the specific rates.

7. Should the City increase rates in smaller increments over time or have one large increase?

   The stakeholders deliberated between increasing the capital investment over time versus increasing the investment immediately. A number of different scenarios ramping the capital costs up over various periods of time were reviewed because the

stakeholders generally acknowledged that increasing capital immediately would be challenging for rate payers. It was also recognized that most capital projects require significant planning and design before they can be constructed so having funding available immediately was not necessary.

RECOMMENDATION

Increase utility rates over a 6-year period to reach the targeted amount per the following table. (Unanimous vote)

8. Recommended Rate Structure:

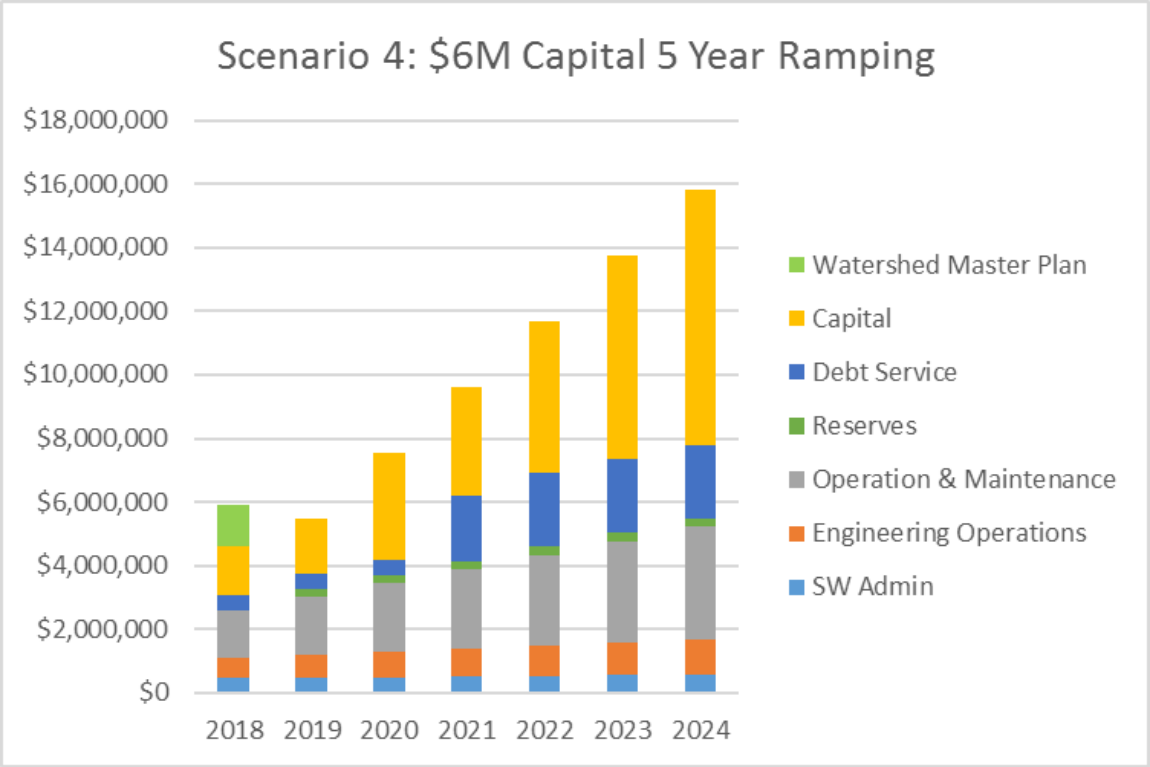
Table ES 2 Recommended Rate Structure

Rate Calculation	FY2020	FY2021	FY2022	FY2023	FY2024	5-Year Average Rate
Administrative Rate per account per month	$1.20	$1.20	$1.20	$1.20	$1.20	**$1.20**
Rate per ERU per month	$6.00	$8.00	$10.00	$12.00	$14.00	**$10.00**
Total Rate	$7.20	$9.20	$11.20	$13.20	$15.20	**$11.20**

The current ERU is $5.35 per month. The majority of residential properties in Greenville are two (2) ERUs which would make the current monthly bill $10.70 per month.

Based on recommendations from the SWAC, the new rate structure (Table ES 2) would include an Administration Charge of $1.20 per month for all rate payers. The ERU would increase to $6 per month in year one of the rate change plus the $1.20 administration charge and then increase $2 per month every year for five (5) years. A property with up to 2,000 sq. feet of impervious area would pay $7.20/month in year one, increasing to $15.20/month in year five. Figure ES 3 below shows the revenue allocation for the stormwater utility fund based on the new utility rates recommended by the SWAC.

Table ES 3 Cash Flow with $6 Million Capital Funding and 5-Year Ramping



The current median ERU rate for 2,000 square feet of impervious area in North Carolina is $3.79 per month. The highest ERU rate for 2,000 square feet of impervious area in North Carolina is $12.10 per month. Stormwater needs can vary significantly for communities based on topography, size, state and federal regulations, and age of infrastructure among other factors. Communities with the lowest stormwater utility fees fund only the minimum water quality components of their programs as required by the federal NPDES rules. Some include regular operation and maintenance of the drainage system and limited capital improvement projects. However, few if any other communities within North Carolina have fully evaluated capital stormwater needs and infrastructure replacement costs, when evaluating utility rates for development of a sustainable program. Consequently, their rates are artificially low and will likely increase as a result of planning and asset management efforts or to fund repairs and replacement as components of the system begin to fail due to age.

Capital Spending Plan:

The Stormwater Advisory Committee was presented a short list of capital projects in detail. The list included projects from the Watershed Master Plans and staff's current list of high priority condition repair/replacement projects. Projects were selected based on the priority ranking

in the watershed master plans, projected available funding, grant or outside funding availability, coordination with other current projects such as resurfacing, and urgency of potential infrastructure failure. These projects were each presented showing the current condition, future conditions, and proposed improvements with a detailed cost estimate for planning, design, and construction. The Stormwater Advisory Committee concurred with staff that these projects are needed and should be planned for completion as soon as funding allows.

Using the modeled cash flow from the rates recommended by the SWAC, the list of priority projects presented to the SWAC was scheduled into a 6-year capital spending plan using a pay-go approach. Available capital funding each year was determined based upon projected annual revenues and Stormwater Utility Fund Balance. A reserve minimum fund balance of $1,500,000 was maintained each year through the capital spending plan. Projects were scheduled based upon available funds at the beginning of each project phase, duration of project phases, and with consideration to staff and contractor workloads. Additional staff in Engineering Operations would be necessary to manage the design and construction of these projects. These needs are budgeted in the CIP cost estimates and funding would come from that source.

The SWAC also determined it was important to include updates to the watershed master plans and an additional utility rate study near the end of the 6-year plan. The Stormwater Advisory Board unanimously concurred with staff on the recommended spending plan as shown.

RECOMMENDATION

Projects should be scheduled and prioritized based upon the presented capital plan shown in Table 7.1. (Unanimous vote)

1.0 Project Methodology

The Stormwater Advisory Committee (SWAC) was reconvened in October of 2017 to provide input regarding the City's Extent of Service, Level of Service, and alternatives for providing adequate funding for stormwater related services. Its members represent a diverse cross section of community stakeholders including valuable experience and expertise in business, development, engineering, and the environment. The current eleven (11) committee members are as follows:

- Tom Best, Chairman SWAC – Vice Chair Pitt County Soil and Water Conservation District Board of Directors
- Drake Brinkley, Vice Chairman SWAC – Commercial Real Estate Attorney with Ward and Smith P.A.
- Donnie Brewer, PE – Consulting Engineer with Rivers and Associates
- Matt Butler – Program Director for Sound Rivers
- Michelle Clements, PE - Consulting Engineer with The East Group,
- Jon Day - President Jon Day and Associates Real Estate
- Don Edwards-Local business owner - President of University Book Exchange
- Joni Torres- Pitt County Cooperative Extension
- Beth Ward - County Commissioner
- Landon Weaver - Land Development Manager with Bill Clark Homes
- Cassius Williams – State Farm Insurance, National Association of Insurance & Financial Advisors

The stakeholders were advised that their meetings would be open to the public, would be advertised ahead of time, and that agendas and meeting minutes would be available to the public. At the first reconvened meeting in October 2017, the stakeholders agreed by unanimous vote to elect Tom Best as Chair and Drake Brinkley as Vice-Chair. The committee also agreed by unanimous vote to several business decisions regarding how the committee would operate. These included:

- To meet at City Hall the first Tuesday of every month from 3 to 5 pm with the exception of moving the January 2nd meeting to January 9th to avoid a conflict with the New Year's holiday;
- Members could assign an alternate if they could not attend;
- Decisions should be made by majority vote with every member given the opportunity to speak or pass on every issue;
- A quorum would consist of two-thirds or seven members;
- The Chair or Vice-Chair would function as tie-breakers if needed; and

- Allow the public a ten-minute period during every meeting to make comments.

The SWAC met a total of 11 times starting in early 2017 through July of 2018. The first two meetings early in 2017 provided introductory material to the committee members regarding the City's Stormwater Program, its utility funding, and the objectives of the committee.

2.0 Extent of Service

The first topic considered by the SWAC was the desired Extent of Service (EOS) to be provided by the City. EOS includes criteria for where and what such as: the geographical limits of service (City limits, Extraterritorial Jurisdiction (ETJ), and beyond the ETJ); ownership of the drainage system (public or private portions of the drainage system); and what components of the drainage system would be served by the City (pipes, streams, lakes, dams, and stormwater control measures). One of the challenges facing the SWAC is that too narrow an extent of service may not adequately serve the community's needs and expectations while too broad of an extent may not be financially sustainable. The SWAC was presented with information comparing the extent of service provided by a variety of other North Carolina communities. Table 2.1 below summarizes those findings.

Table 2.1 Comparison of Extent of Service for Selected NC Communities

	Community					
	Greenville	**Raleigh**	**Cary**	**Asheville**	**Wilmington**	**Greensboro**
Service provided						
public SCM maintenance (Utility maintains for other dept)	x	x		soon	x	x
maintain private SCM's						
Assist with private lakes/dams		x				
leaf collection		just starting	x			x
maintain only in ROW and public easements	by ordinance		x	x	x	
Maintain outside ROW (receives runoff from public)	by practice	x				x
obtain public drainage easements	x	x		some	x	some
cost share for private drainage improvements	100%	100% least cost	50%/50%			
cost share for water quality improvements		from 75 to 90%		limited		
inspect private SCM's annually	x	audit				x
Construct SCM retrofits for WQ	pending funds	x			x	x

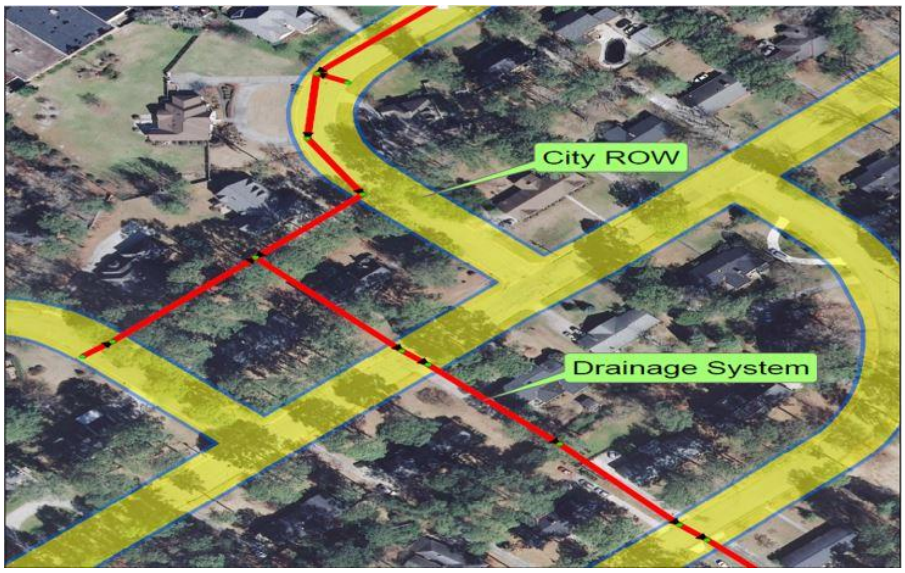
2.1 Public vs Private Property

the City drainage system currently encompasses approximately 237 miles of storm drainage pipes; 17,000 drainage structures…and 95 miles of City maintained ditches

The SWAC members were asked to consider where the City should maintain drainage infrastructure within the City limits. The committee was informed that the City drainage system currently encompasses approximately 237 miles of storm drainage pipes; 17,000 drainage structures such as street catch basins and yard inlets; 97 large culverts that covey streams under roadways; and 95 miles of City maintained ditches and other open drainage systems.

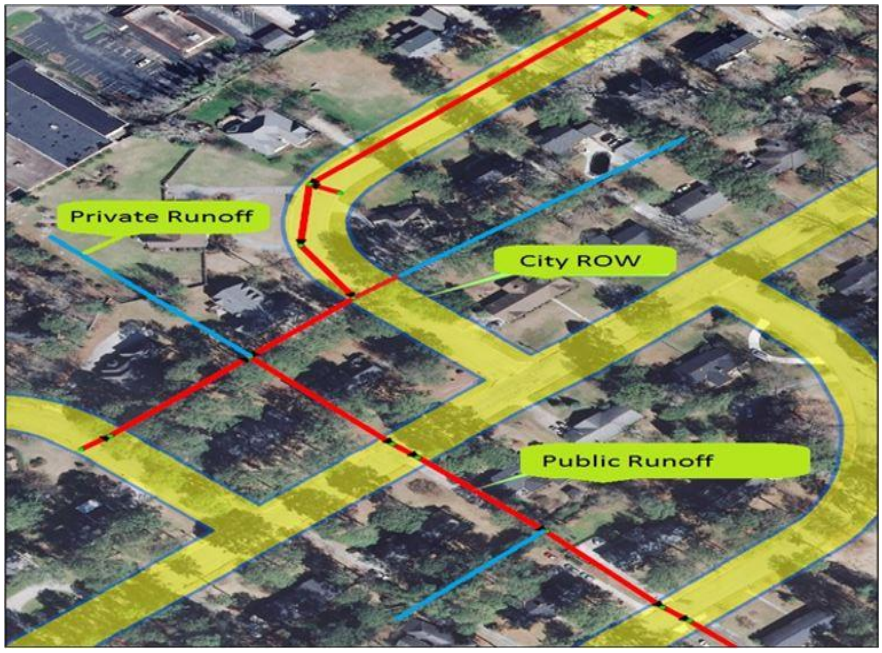
Responsibility for that system falls into one of three main categories; full City responsibility, limited City Responsibility, and no City responsibility. As the owner and operator, the City has full responsibility for the operation and maintenance of those portions of the drainage system associated with City streets and City property. By ordinance, the City currently provides limited services for those portions of the drainage system on private property that carry "public" stormwater runoff from roadways and other City property. An example of where public water is conveyed from City street right-of-way (highlighted in yellow) through private property (in red) is shown in Figure 2.1.

Figure 2.1 Public Runoff



Also, by ordinance, the City has established that storm drainage crossing private property, which does not carry stormwater runoff from existing City or State systems streets, is the responsibility of the private property owners. An example of those portions of a drainage system that convey only runoff from private property (in blue) is shown in Figure 2.2.

Figure 2.2 Private Runoff



The following City existing ordinances establish the extent of services that the City will provide outside of City owned rights-of-way on private property where the system carries public water. These ordinances are included in Appendix A.

- Section 9-9-13 (A) establishes that the City will participate with property owners **in the installation of storm drains**

crossing private property, in other than new subdivisions, within the corporate limits under certain conditions and with certain limitations.

- Section 9-9-13 (B&D) establishes that the City will participate with property owners **in the stabilization of ditches and streams** crossing private property within the corporate limits under certain conditions and with certain limitations
- Section 9-9-14 (A) establishes limited City responsibility for portions of Greens Mill Run, Fornes Branch, Reedy Branch, and other jurisdictional streams within the limits of a city drainage project.
- Several other sections within the ordinance clarify that City participation in work on drainage system components outside of the right-of-way is limited to the extent to which funds are available for such purposes and that they are scheduled so as not to interfere with other City projects.

While evaluating the City's current extent of service regarding drainage on private property, the stakeholders considered that some NC communities provide no maintenance at all on private property while a limited number of communities assume full responsibility for the privately-owned portions of the drainage system. Currently, private portions of the drainage system are not inspected by the City and no easements are provided for City access for maintenance. Because the quality of installation and the overall condition of the private portion of the drainage system is unknown and simply because of the increase in the extent of the system, it was noted that accepting maintenance responsibility for all private portions of the drainage system would dramatically increase budget needs. The committee considered possible modifications to limit or expand those services. Concerns were expressed by committee members regarding scenarios where citizens could not afford to repair failing portions of the system, previously installed by a developer, on their property, especially for larger expensive pipe systems. As part of the discussion it was noted that in 2002, the previous stormwater advisory committee had recommended that the City accept maintenance responsibility for all pipes over 15 inches in diameter that meet certain criteria, but that recommendation was not supported by the City Council

The three primary options considered by the current stakeholder committee included:

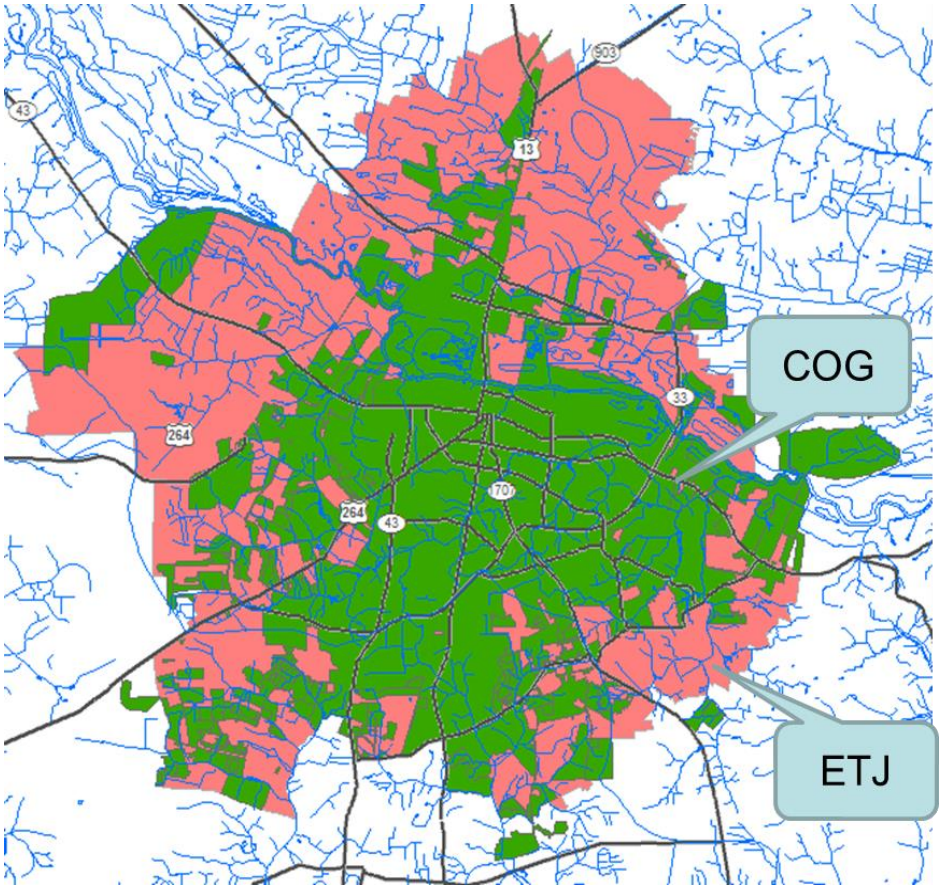
1) Maintain only those portions of the drainage system on public property or within the street right-of-way (ROW);
2) Maintain those portions that convey runoff ("public water") from public property; or
3) Maintain all portions of the drainage system both on public and private property regardless as to whether they convey runoff from public property.

Recommendation: The SWAC recommended that the City should continue to maintain only those portions of the drainage system on private property that convey public water. (Unanimous vote)

2.2 City Limits vs ETJ

SWAC members considered if stormwater services should be limited to the 36 square mile area within the City of Greenville City Limits (COG) or provide stormwater services beyond the City Limits in the Extra Territorial Jurisdiction (ETJ) which encompasses an additional 32 square miles almost doubling the current service area. Figure 2.3 identifies these areas as green and pink, respectively.

Figure 2.3 Greenville ETJ and Corporate Limits



At present, the City is responsible for the drainage system within the City's Corporate Limits. Outside of these limits, in the ETJ, those portions of the drainage system located within public streets are typically maintained by the North Carolina Department of Transportation (NCDOT), unless or until an area is annexed into the City. Those portions located on private property are maintained by the property owners. It was also noted that in some cases, assistance may be available through the County Drainage District. As part of the discussion, the committee considered that new development in the ETJ is subject to City stormwater regulations and that as part of compliance with its stormwater permit, the City is required to approve drainage system designs and inspect their installation as well as the installation of stormwater controls in the ETJ. Following installation, the City inspects private

stormwater controls on an annual basis but receives no inspection fees. It was further clarified that while the City does provide these kinds of services in the ETJ, State law prohibits the collection of Stormwater Utility Fees outside of the city limits. Since residents and business owners in the ETJ do not pay the stormwater utility fee, the City does not provide maintenance of the stormwater system in the ETJ. This was consistent with most NC communities that also limit their responsibility to within the City Limits.

Discussions among the committee included concerns regarding keeping City money within the City. Some members commented that since stormwater utility fees are only being collected within the City limits then they should only be spent within the City limits. Other committee members agreed with this philosophy but noted the need for exceptions to address catastrophic issues outside of the City. There was general agreement that there should be some kind of allowance to address extreme issues outside of the City limits but there was concern about how to limit the City's financial exposure. It was suggested that setting aside a fixed amount of funding each year for work in the ETJ could be used to allow limited service outside the City limits. It was noted that since drainage knows no political boundaries, there are situations where drainage flows from the ETJ into the City and back into the ETJ again as shown in Figure 2.4 below. In other cases, a stream centerline may form the boundary between the City limits and the ETJ and solutions to most stream flooding and erosion problems require work on both banks of a stream necessitating work in the ETJ. Also, solving certain drainage problems that adversely impact the City, such as blocked culverts, may require City action or joint efforts with the County or State in the ETJ.

"drainage knows no political boundaries"

Figure 2.4 Drainage Example from ETJ Into City Limits

Drainage problems associated with both Corey Road and the Windsor development and flooding in the Langston Road area were brought up by the committee as examples of where drainage crossed City, NCDOT, and private property. Implementing solutions in these instances can be challenging due to the different jurisdictions responsible for drainage maintenance. The committee also considered that the list of needed drainage system improvements, identified in the City's Watershed Master Plans, did not include areas in the ETJ and did not distinguish between ownership of the system. Consequently, any new projects in the ETJ would need to be considered for prioritization compared with already identified City projects and the implementation of solutions in these areas would likely require some level of coordination with NCDOT and other owners. It was also noted that extending maintenance into the ETJ would dramatically increase budget

> *"extending maintenance into the ETJ would dramatically increase budget needs"*

needs with larger projects being funded through the Capital Improvements budget and smaller projects and regular maintenance being funded through the Operations budget.

The options considered by the committee included:

1) Provide no service in the ETJ (status quo);
2) Provide limited services where there is a direct benefit to the City;
3) Expand services in the ETJ similar to what is currently provided within the City.

Recommendation: The SWAC recommended that the City should limit the maintenance of infrastructure in the ETJ, outside of City limits, to those situations where there is a direct benefit to the City and its residents. (Unanimous vote)

2.3 Funding of Leaf Collection

The SWAC considered whether leaf collection should be funded in the stormwater utility. Leaf collection is funded by the stormwater utility in a limited number of other communities as a component of their NPDES stormwater quality program since they contribute to nutrient loading and can clog components of the drainage system if not managed properly.

Recommendation: The SWAC recommended that leaf collection remain funded through the Solid Waste Division. (Unanimous vote)

2.4 City maintenance of private Best Management Practices (BMPs)

SWAC members considered if the City should assume responsibility for maintaining privately owned stormwater controls, such as detention basins. These stormwater controls, also referred to as Best Management Practices or BMP's are required on new commercial and residential development to protect water quality and reduce downstream flooding. State rules require local communities to ensure the long-term inspection and maintenance of these privately-owned BMP's. City Staff currently inspect BMP's to verify they are functioning properly, but maintenance are repairs are left up to the owners. Based on these inspections, staff found that while commercial developments are generally capable of maintaining these devices, maintenance in residential developments has been far less successful. Typically, these BMP's fall under the responsibility of a Homeowners Association that lacks the technical and financial capabilities for proper management and maintenance of these devices. A limited number of North Carolina communities, including Charlotte, have accepted maintenance of private stormwater controls as a solution to difficulties encountered ensuring their proper maintenance by residential homeowner's associations and other owners. (See

Table 2.2 below) However, due to funding limitations and lack of interest on the part of the owners, few if any communities are actually maintaining private BMP's. Charlotte staff noted that while they offer maintenance of private BMP's, they have yet to take over maintenance of any.

Table 2.2 Comparison of BMP Maintenance and Inspection for Selected Communities

	Community						
	Greenville	Raleigh	Cary	Asheville	Wilmington	Greensboro	Charlotte
Service provided							
Maintain Publicly Owned BMP's (Utility maintains for other dept)	x	x		soon	x	x	x
Inspect Privately Owned BMP's	x	x	x	x	x	x	x
Maintain Privately Owned BMP's							x

The options considered by the committee included:

- Keeping maintenance, the responsibility of the device owner
- Accepting maintenance responsibility for all privately-owned BMP's
- Accepting maintenance for only BMP's in residential developments.

Recommendation: The SWAC recommended that the City should not maintain private Best Management Practices (BMPs) although the consideration of exceptions in residential subdivisions may be considered in the future. (Unanimous vote)

3.0 Level of Service

The next topic considered by the SWAC was the desired Level of Service (LOS) to be provided by the City. LOS describes the types, frequencies, and magnitude of activities and benefits derived from the City's stormwater program. Based on discussions with City staff, the overall LOS for the stormwater program is more reactive than proactive. The City would like to move into a more proactive position particularly as it relates to program management and operations and maintenance. This increased investment to transition to a more proactive approach in stormwater management will allow the City to most effectively use its resources to identify and resolve infrastructure issues before they result in a failure which can endanger the public and impact operations within the City. The City has already taken a major first step in proactive management through the completion of the seven Watershed Master Plans. An example of reactive management would be the failure of the 3rd Street culvert resulting in a significant road closure impacting traffic flow in Uptown Greenville. An Asset Management program and more frequent maintenance can help identify infrastructure that is at risk of failure and proactively repair that infrastructure at reduced costs before it impacts the residents and business owners in Greenville. As part of a proactive program, increased construction inspection services are imperative to ensure that drainage systems constructed by private developers, and transitioned to the City for maintenance, are correctly installed to avoid having to take corrective action in these systems long before the design life has expired.

> *"increased investment … to a more proactive approach … to identify and resolve infrastructure issues before they result in a failure"*

The SWAC considered whether the current LOS was adequate, inadequate, or excessive. Their goal was to identify a LOS that addressed the primary needs of the City's comprehensive stormwater management program as well as the expectations of the community and its citizens. For discussion purposes, LOS was broken down into 3 major categories:

1. Program Management and Regulatory Compliance – This category includes:

    a. Administration and Management – billing, finance, and auditing, personnel management, and responding to citizen complaints and inquiries
    b. Engineering Operations – strategic and master planning; in house design of projects with construction budgets of less than $100,000; project management and inspections for major system repairs and improvements; streambank

stabilization; property acquisition; asset management and system inventory; and management of CIP programs

c. Regulatory Compliance -permitting and inspection of development for compliance with sedimentation and erosion control, floodplain, and post-construction stormwater regulations; public education and outreach; public participation; illicit discharge detection, elimination, and enforcement; pollution prevention and good housekeeping for City operations

2. Operation and Maintenance – Includes inspection, cleaning, and minor repairs to closed portions of the drainage system such as inlets and pipes; inspection, cleaning, and minor repairs to open portions of the drainage system such as roadway culverts, bridges, ditches and channels; inspection and minor repairs to publicly owned dams and stormwater controls; stream inspection and clearing to maintain flow and prevent flooding through the removal of trees, sediment and other blockages; and street sweeping.

3. Capital Improvement –this category includes
   a. Capital Projects – significant constructed improvements to the stormwater system to reduce flooding or improve water quality as identified through watershed master plans or other demonstrated need. Recently completed Watershed Master Plans have identified over $170 million worth of capital improvement needs. These include $95 million in large flood control projects; $40 million in smaller localized flood relief projects; $12.5 million in streambank stabilization projects; and $20.5 million towards projects associated with reducing water pollution and improving water quality and stream health.

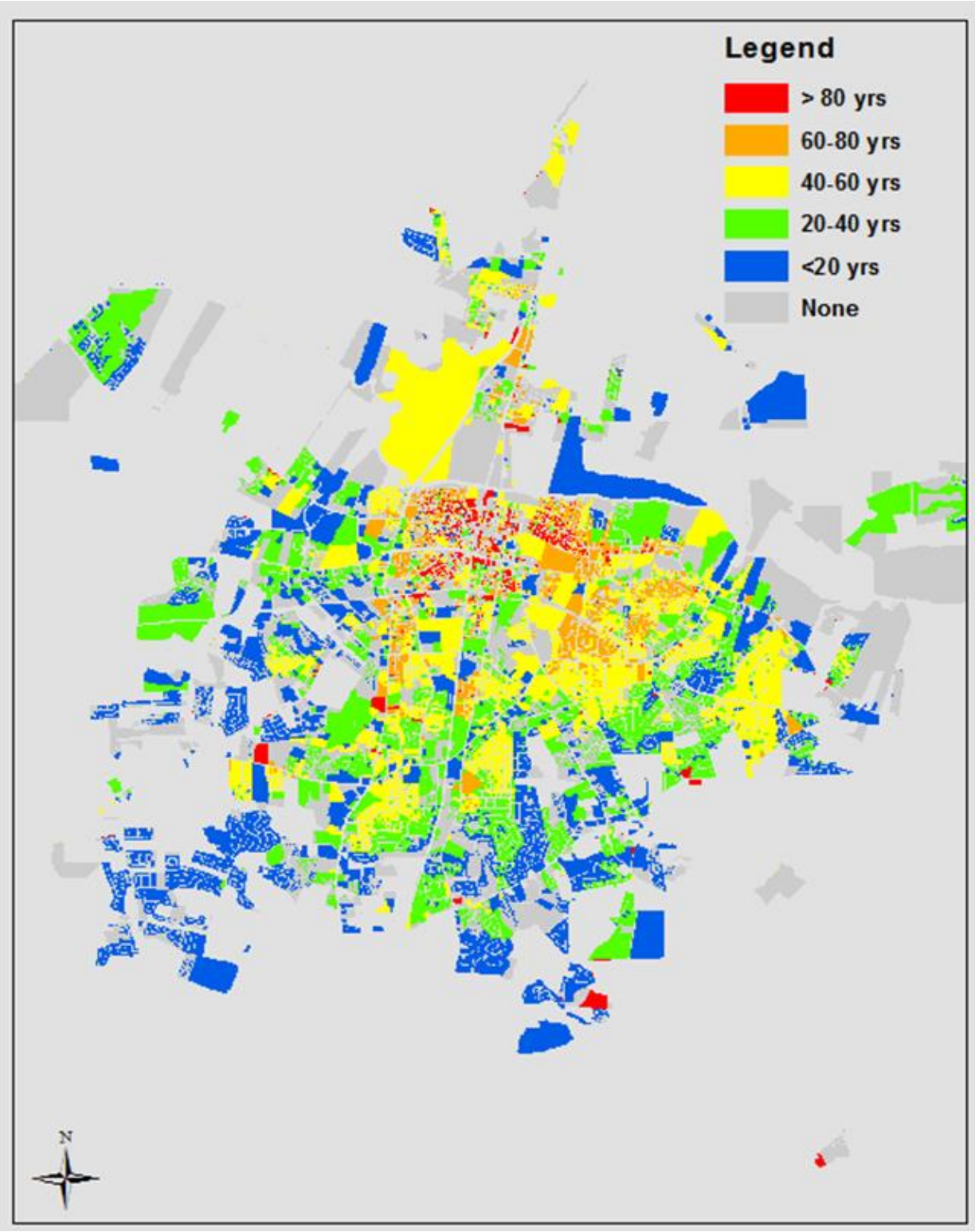
"identified over $170 million worth of capital improvement needs"

   b. Capital Replacement – replacement of elements of the stormwater system as they reach the end of their useful life or as the result of failure. The City drainage system includes over 237 miles of pipes and 17,000 structures. The cost to replace this infrastructure when it reaches the end of its useful life is estimated at over $230 million dollars. Although the actual life span of the drainage infrastructure is difficult to predict

various portions of the drainage … are already beyond their predicted life expectancy

accurately and varies depending on the quality of the material used, care of installation, and level of maintenance, it is estimated that the average life span of the drainage system between 40 and 80 years. Based on the estimated ages of various portions of the drainage system (see Figure 3.1 below) some portions of the system, especially in the older uptown area of the City, are already beyond their predicted life expectancy and a large portion of the system is nearing the end of its useful life.

Figure 3.1 Estimated Age of Drainage System Infrastructure



The letter grading system below was used to evaluate the LOS for each of these categories.

Table 3.1 Level of Service "Grades"

	General Program Categories		
Level of Service "Grade"	**Program Management & Regulatory Compliance**	**Operation & Maintenance**	**Capital Improvement (CIP)**
A	comprehensive program planning, aggressive state and federal regulatory compliance that exceeds minimum requirements in all cases, state of the art practices, full program implementation	fully preventative and proactive maintenance , state of the art practices	all known CIP needs completed in 10 years
B	basin master planning, above average state and federal regulatory compliance that exceeds minimum requirements in most cases, systematic program implementation	fully routine & partially inspection based maintenance	all known CIP needs completed in 20 years
C	federal regulatory compliance that exceeds minimum requirements in some cases, priority program implementation	limited routine maintenance, limited inspection based maintenance, partially reactive maintenance	all known CIP needs completed in 30 years
D	minimal planning, minimum required state and federal compliance, partial program implementation	no routine or inspection based maintenance, reactive maintenance only	all known CIP needs completed in 40 years
E	no planning, minimum required state and federal compliance, minimal program implementation	limited reactive maintenance	all known CIP needs completed in 50+ years

Both the members of the SWAC and City staff were tasked with completing tables of the three main program categories and sub-categories (See Appendix B) by assigning a letter grade between A and E, with A being the highest, to each of several tasks identified under the 3 main categories for what they felt were:

- The Current LOS (what are we doing now)
- The Promised LOS (the LOS the City has committed to based on ordinance, policy or public commitment): and
- The Desired LOS (what LOS should we be providing to our citizens)

The results were then tallied (See Results of Level of Service Poll in Appendix C) and summarized in the following tables. The committee then compared and discussed differences between the groups.

- Under Program Management and Regulatory Compliance, both the SWAC and staff agreed that the current level of service was level C. Under the Promised level of service, the SWAC felt the level was B while staff felt it was a level C. Under the Desired level of service both the SWAC and staff agreed on a level B.
- Under Annual Operations and Maintenance, both the SWAC and staff agreed with a finding of level C for Current LOS; level C for Promised; and level B for Desired.
- Under Capital Improvement there was greater disparity among the two groups. Under Current level of service, the SWAC identified a LOS of C while staff selected a LOS of D. Under Promised level of service, the SWAC selected a LOS of B while staff again selected level D. For the Desired level of service, the SWAC again selected a LOS of B while staff selected a LOS of C. Most of the difference between the two groups was attributed to staff's greater knowledge of the magnitude and total cost of completing all the known CIP needs which are substantial. It was noted that Greenville is unusual because they possess a solid estimate of most of their future CIP needs as the result of the already completed Watershed Master Plans. Most NC communities have not completed watershed studies and do not have a complete understanding of their CIP needs. Consequently, staff assigned lower grades knowing of the challenging of completing all the known CIP projects in the period of years associated with the levels identified by the committee.

Table 3.2 Summary of Level of Service Results

	Program Management & Regulatory Compliance		
Level of Service "Grade"	**Current**	**Promised**	**Desired**
A	comprehensive program planning, aggressive state and federal regulatory compliance that exceeds minimum requirements in all cases, state of the art practices, full program implementation	comprehensive program planning, aggressive state and federal regulatory compliance that exceeds minimum requirements in all cases, state of the art practices, full program implementation	comprehensive program planning, aggressive state and federal regulatory compliance that exceeds minimum requirements in all cases, state of the art practices, full program implementation
B	basin master planning, above average state and federal regulatory compliance that exceeds minimum requirements in most cases, systematic program implementation	basin master planning, above average state and federal regulatory compliance that exceeds minimum requirements in most cases, systematic program implementation	basin master planning, above average state and federal regulatory compliance that exceeds minimum requirements in most cases, systematic program implementation
C	limited planning, average state and federal regulatory compliance that exceeds minimum requirements in some cases, priority program implementation	limited planning, average state and federal regulatory compliance that exceeds minimum requirements in some cases, priority program implementation	limited planning, average state and federal regulatory compliance that exceeds minimum requirements in some cases, priority program implementation
D	minimal planning, minimum required state and federal compliance, partial program implementation	minimal planning, minimum required state and federal compliance, partial program implementation	minimal planning, minimum required state and federal compliance, partial program implementation
E	no planning, minimum required state and federal compliance, minimal program implementation	no planning, minimum required state and federal compliance, minimal program implementation	no planning, minimum required state and federal compliance, minimal program implementation
	SWAC ranking		
	Staff ranking		
	Same ranking		

Annual Operations and Maintenance

Level of Service "Grade"	Current	Promised	Desired
A	fully preventative and proactive maintenance , state of the art practices	fully preventative and proactive maintenance , state of the art practices	fully preventative and proactive maintenance , state of the art practices
B	fully routine & partially inspection based maintenance	fully routine & partially inspection based maintenance	fully routine & partially inspection based maintenance
C	limited routine maintenance, limited inspection based maintenance, partially reactive maintenance	limited routine maintenance, limited inspection based maintenance, partially reactive maintenance	limited routine maintenance, limited inspection based maintenance, partially reactive maintenance
D	no routine or inspection based maintenance, reactive maintenance only	no routine or inspection based maintenance, reactive maintenance only	no routine or inspection based maintenance, reactive maintenance only
E	limited reactive maintenance	limited reactive maintenance	limited reactive maintenance

SWAC ranking

Staff ranking

Same ranking

Capital Improvement (CIP)

Level of Service "Grade"	Current	Promised	Desired
A	all known CIP needs completed in 10 years	all known CIP needs completed in 10 years	all known CIP needs completed in 10 years
B	all known CIP needs completed in 20 years	all known CIP needs completed in 20 years	all known CIP needs completed in 20 years
C	all known CIP needs completed in 30 years	all known CIP needs completed in 30 years	all known CIP needs completed in 30 years
D	all known CIP needs completed in 40 years	all known CIP needs completed in 40 years	all known CIP needs completed in 40 years
E	all known CIP needs completed in 50+ years	all known CIP needs completed in 50+ years	all known CIP needs completed in 50+ years

SWAC ranking

Staff ranking

Same ranking

The SWAC then considered what to recommend for the overall desired LOS for each main category. In general, the stakeholder's desire was to move from a primarily reactive program to a more proactive program due to the long-term cost savings and improved service resulting from proactive management. By providing more proactive maintenance, condition assessment, and asset management, component failures and associated flooding and property damage may be prevented, and the life of the existing infrastructure extended. A more proactive approach could also result in substantial cost savings in terms of the accumulating costs of flood damage to structures, interruption of roadways and other services due to flooding. Cost savings would also be recognized by repairing as opposed to replacing infrastructure if problems can be identified earlier. The same would apply to addressing minor stream bank erosion and system clogging before they become major problems that damage public and private property. It was recognized that a higher level of service would be necessary to achieve that goal.

Recommendation: The SWAC agreed on the following desired level of service recommendations;

- **B for Program Management and Regulatory Compliance;**
- **B for Operations and Maintenance; and**
- **the stakeholders decided to wait and see how much funding would be available for CIP activities before deciding on a level of service and prioritizing CIP needs. (Unanimous vote)**

To quantify the desired levels of service as the next step towards developing costs associated with each category for funding analysis, staff worked with the consultants to estimate the resources required to achieve the desired LOS.

To increase the LOS to a level B for Program Management and Engineering Operations it was estimated that 2 Inspectors, 1 Billing Technician, Pipe Inspection Camera Equipment, and additional vehicles would be required resulting in an estimated funding increase of approximately $296,000 per year. Increases in Engineering Operations funding would provide staff and equipment for increased inventory, assessment, and asset management.

Anticipated needs for increasing the LOS to level B for Operations and Maintenance would require adding 11 additional staff, a tracked excavator, a large truck, a Jet-Vac truck, and other equipment, fuel, and materials necessary to increase the frequency of system inspections and maintenance.

The funding needs for these combined efforts was estimated at $1,166,000 per year.

Since no LOS was decided upon for the Capital Improvement Program (CIP) category, various levels of funding were developed and presented to the SWAC for consideration. The CIP or Capital Investment category included funding for both major repairs and improvements as well as costs for replacement of the drainage system infrastructure as it reaches the end of its useful life or Capital Asset Replacement costs. Funding for additional staff in Engineering Operations would also be necessary to implement both CIP programs. Costs for additional staff to manage the CIP projects, as well as their design and construction, were budgeted in the CIP cost estimates and funding would come from that source.

4.0 Regulatory Climate

Funding needs can be impacted by external forces such as compliance with new or expanded regulatory programs. Greenville is currently subject to several external regulatory programs related to its stormwater program. These include the State Sediment Control Act and its requirements, Phase II of the National Pollutant Discharge Elimination System (NPDES) Stormwater requirements for small municipalities (those with populations under 100,000), and the requirements of the Tar-Pam Nutrient Sensitive Waters (NSW).

As a result of current political trends to downsize government and accompanying efforts to reduce regulatory burdens, the requirements of most regulatory programs are maintaining a status quo or in some cases experiencing reductions. An example of this would be pending modifications to the NC Neuse River and Tar River Basin Rules for new development (anticipated to be adopted in the fall of 2019) which would afford cities the opportunity to reduce some regulatory burdens on cities if they so choose such as eliminating the requirement to identify potential stormwater retrofit opportunities, exempting individual single family residential properties with less than 5% built upon area or those over 5 acres in size, and dropping the 1-year / 24-hour peak runoff rate match. In the case of Greenville, there are few if any situations where the single-family exemption will apply, and the City will need to decide if they desire to continue or drop the 1-year peak runoff match. However, these same pending regulations propose to add 16 new communities to the Neuse NSW program including Greenville. Since Greenville is already subject to the Tar-Pam NSW rules which are essentially the same ruleset, initial impacts should be limited to the modification of local ordinances and annual report preparation and submittal. However, these rules will regulate new development and any current or future changes in the rules will impact the development community.

Under the State's surface water classification system, communities permitted under the NPDES Stormwater program may be held responsible for meeting Total Maximum Daily Limits (TMDL) for stormwater discharges for watersheds that are considered impaired or not meeting their designated water use classification. Although not yet subject to TMDL requirements, several of Greenville's watersheds are currently listed as impaired by the State.

- Greens Mill Run, classified by the State as C; NSW, (see footnote runs to the east through the heart of the City and is listed as impaired on the State 303(d) list from its source to the Tar River since 2008 for Benthos (the number and diversity of the aquatic organisms that live in the stream are below NC standards).

- Swift Creek (also Classified by the State as C; NSW) drains to the south of Greenville and is listed as impaired from its source to 5.3 miles upstream of Clayroot Swamp since 1998 for Benthos.

  Note: "Class C" is the State's lowest general surface freshwater classification and is applied to most streams and rivers that are not part of a water supply watershed. "NSW" stands for Nutrient Sensitive Waters and is assigned to watersheds where there are known, or anticipated impairments caused by excess nutrients. A well-known example of this is the algal blooms and associated fish kills in the Neuse River estuary. NSW watersheds often have mandatory requirements for new construction to reduce nutrients in runoff through the implementation of stormwater controls or through non-structural means such as low-density development and limiting impervious surfaces.

While these impairment listings carry no additional regulatory burden at this time, it is possible that the State will pursue implementation of a Total Maximum Daily Load (TMDL) on these watersheds at some time in the future. Such an action could result in the need for new local regulations, water quality improvement programs, and increased costs to implement and maintain compliance. However, the NC Division of Environmental Quality has demonstrated a reluctance to pursue new TMDL's unless a specific pollutant of concern can be identified. No specific pollutant has been identified for these two streams where impacts to benthic macroinvertebrates are used as an indirect surrogate of water pollution.

5.0 Utility Rate Study and Recommendations

5.1 Rate Alternatives

Greenville's Stormwater Utility fee is a relatively simple system based solely on the amount impervious surfaces on a property. The utility fee does not currently include fixed costs, as some other utilities do. Properties with impervious surfaces that do not receive an electrical bill are also not charged. As part of the discussion on funding, the SWAC considered various ways to refine the City's fee system to improve equity and capture missed revenue. Based on discussions with the SWAC, the stakeholders identified three (3) rate alternatives for further analysis and consideration. The SWAC also considered one billing policy alternative. Once the alternatives were presented, the SWAC identified which, if any, of the rate alternatives and billing policy alternatives to include in the final SWAC recommendation.

5.1.1 Minimum Equivalent Rate Unit (ERU) (Rate Alternative)

Currently, for multi-unit properties located in the City of Greenville, the impervious area, number of ERUs, and stormwater charge is calculated for the whole property and divided equally among the number of units on the property. The result of this calculation methodology is that some units are charged a stormwater fee of less than the current rate of $5.35 per ERU per month. The current methodology also relies heavily on having up to date information on the number of units located on a property.

Under a minimum ERU scenario, any unit that is currently being charged less than 1 ERU would instead be charged 1 ERU, while all other units would still be charged using the current methodology of calculating the impervious area, number of ERUs, and stormwater charge for the whole property and dividing it equally among the total number of units on the property.

"for multi-unit properties … (the) stormwater charge is calculated for the whole property and divided equally among the number of units"

The SWAC felt that establishing a minimum ERU may help to recover some additional revenue in a way that reduces the burden of trying to collect very small stormwater charges and is relatively easy to implement. A minimum ERU of 0.5 was also considered by the SWAC.

Having a minimum charge of 0.5 ERUs was estimated to increase revenue at any rate by 0.1%. Having a minimum charge of 1 ERU was estimated to increase revenue at any rate by 4%.

Recommendation: Implement a minimum charge per unit in multi-unit buildings to one (1) Equivalent Rate Unit (ERU) (Estimated Revenue $295,000/year). (Unanimous vote)

5.1.2 Additional Residential Tier (Rate Alternative)

Currently, the City of Greenville has four residential tiers and the impervious area, ERUs, and current rate are shown in Table 5.1. The majority of residential properties fall into Tier II.

Table 5.1. Additional Residential Tier Structure

Tier	Impervious Area	ERUs	Rate
I	200 – 2,000 sq. ft.	1	$5.35
II	2,001 – 4,000 sq. ft.	2	$10.70
III	4,001 – 6,000 sq. ft.	3	$16.05
IV	6,000 + sq. ft.	4	$21.40

Under the additional residential tier scenario, the impervious area for Tier IV would change to 6,001 to 8,000 square feet, the ERUs stays at 4, and the current fee is $21.40. An additional Tier 5 would be added with an impervious area of greater than 8,000 square feet, 5 ERUs, and a current fee of $26.75. Adding an additional residential tier was estimated to increase revenue by 0.2% at any given rate.

The SWAC felt that adding an additional residential tier would help to recover some additional revenue in a fair way but determined that the cost to establish and administer an additional tier would not justify the limited revenue generated which was estimated at $14,000 per year.

Recommendation: The SWAC recommended to <u>not</u> add a fifth residential tier for ERU billing due to the limited increase in revenue from making this change. (Unanimous vote)

5.1.3 Vacant Units (Billing Policy)

The City of Greenville does not currently charge a stormwater fee to properties that are vacant. The Greenville Utilities Commission (GUC) is the billing agent for the stormwater fee. Services provided by GUC include electric, natural gas, water, and sewer. When a GUC service is turned off at a property, then the stormwater fee is also not assessed that month. GUC does not bill any customers where their only assessed charge would be for stormwater. This billing policy impacts both residential and non-residential properties.

The SWAC felt that all properties should be charged for stormwater regardless of whether they were vacant or not. In addition, charging these properties for stormwater would allow the City to collect more stormwater revenue and minimize stormwater rates. However, the SWAC acknowledged that working with GUC to bill these properties may be challenging and may not even be possible.

Billing for vacant units was estimated to increase revenue by 3.6% at any given rate.

Recommendation: Collaborate with GUC to identify strategies and billing practices for stormwater only rate payers (Estimated Revenue $265,000/year). (Unanimous vote)

5.1.4 Administrative charge (Rate Alternative)

Currently, all of the City's stormwater expenses are allocated to impervious area and are variable based on the impervious area located on the property. However, there are some stormwater expenses that are constant on a per account basis and could be allocated to an administrative charge. For example, expenses associated with stormwater program administration or citywide contract services may be allocated to an administrative charge. In this context, the administrative charge would be fixed on a per account basis.

"some stormwater expenses that are constant on a per account basis … could be allocated to an administrative charge"

To develop the administrative charge each line item was allocated to either the administrative charge or the impervious area charge. Then the costs allocated to administration were added up and divided equally among all the accounts.

The SWAC felt that an administrative charge would more accurate allocate stormwater expenses and would minimize the impervious area rates.

The preliminary administrative rate was estimated to be $1.30 per account. The administrative charge was presented as a revenue neutral option as well as a revenue generating option. If the City did not reduce the impervious area charge because of implementing the administrative charge, then the City could recoup approximately $500,000 per year.

Recommendation: Include a fixed administrative charge to all rate payers for the portion of the Stormwater Program services that is equally distributable regardless of impervious area (Estimated Revenue $518,000/year) (Note that the preliminary estimated administrative rate is higher than the final recommended administrative rate due to the decision to start billing for vacant units). (Unanimous vote)

5.2 Levels of Service Alternatives

Based on the levels of service (LOS) agreed upon by the stakeholder committee, estimated costs for the categories of program management, operation and maintenance, and capital improvement were determined.

5.2.1 Program Management

The SWAC agreed that there should be some increase in level of service related to program management including increases in both Administration to address modifications and improvements to billing and in Engineering Operations to increased service in the areas of system inventory and assessment; new infrastructure inspection, and asset management. After discussions with City staff, the SWAC, and the consulting team, the new costs for program management including additional costs for administrative and engineering staff including benefits and equipment were estimated at approximately $296,000 per year.

Recommendation: The desired level of service for Program Management and Regulatory Compliance is B. Estimated costs are approximately $296,000 per year (Unanimous vote)

5.2.2 Operations and Maintenance

The SWAC agreed that there should be some increase in level of service related to operations and maintenance. After discussions with City staff, the SWAC, and the consulting team, the new costs for operations and maintenance including additional costs for staff including benefits, equipment, fuel and maintenance were estimated at approximately $1,166,000 per year. These costs were ramped up over a three-year period.

Recommendation: The desired level of service for Operations and Maintenance is B. Estimated costs are approximately $1,166,000 per year (Unanimous vote)

5.2.3 Capital Improvement

The City has a Capital Improvement Program (CIP) that includes a list of projects and estimated costs. The total estimate for all projects listed in the CIP in 2016 dollars is approximately $170,000,000. Capital replacement of aging infrastructure is also included under capital improvement. The capital replacement costs assuming a 40-year life cycle for pipes and structures is estimated to be $5,750,000 annually, not including inflation.

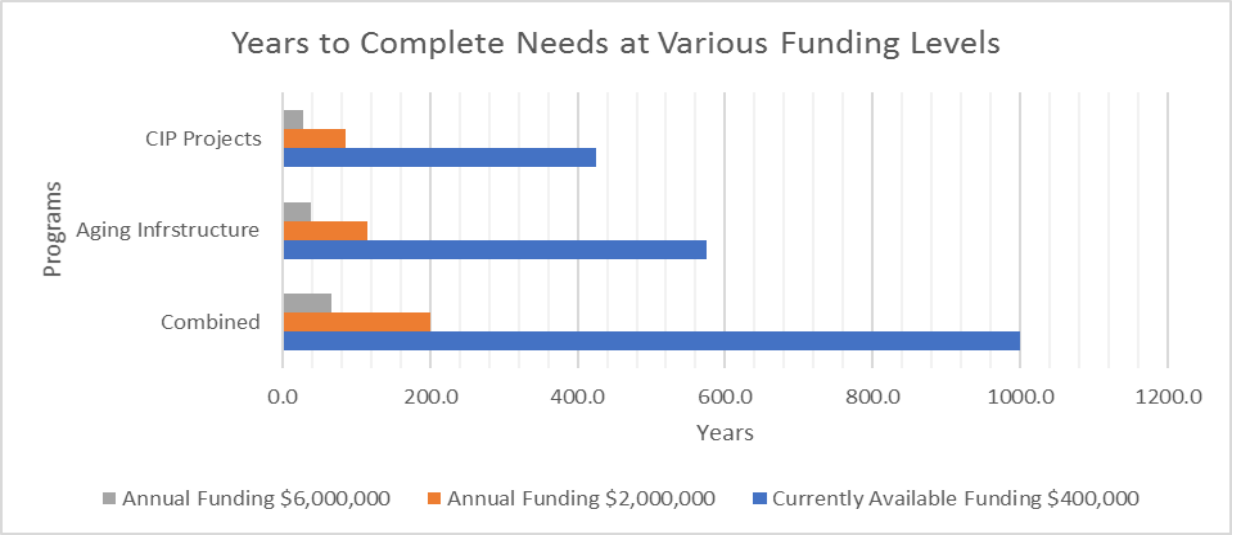
Due to the large capital needs identified, the SWAC felt that an increase in the level of service for capital improvement was necessary but there was disagreement over the increase in capital improvement level of service. Due to the potentially large impact on stormwater rates, the SWAC requested that level of service alternatives for capital improvement be presented and discussed in more detail by the stakeholders.

For comparison purposes, the capital improvement level of service increase was varied over four different scenarios that were presented to the stakeholders.

Initially, capital improvement levels of $2,000,000, $4,000,000, and $6,000,000 were presented to the stakeholders. Based on preliminary discussions, members of the SWAC were divided between the lower $2M and the $6M options with little interest in the $4M option. Those favoring the lower option sought to limit the financial impact on rate payers. Those favoring the higher option believed that was the minimum funding necessary for a sustainable program and wanted to avoid the need to go back later to request another rate increase. (See Figure 5.1). In addition, the stakeholders were deciding between increasing the capital investment over time versus increasing the investment immediately. The scenarios ramping the capital costs up over a period of time were included because the stakeholders generally acknowledged that increasing capital immediately would be challenging since most capital projects require significant planning and designing before they can be constructed. The final level of service alternatives presented included the following:

- Scenario 1: $2,000,000 in capital starting in FY 2020
- Scenario 2: $2,000,000 in capital starting in FY 2024 with increases in capital each year over a 5-year period
- Scenario 3: $6,000,000 in capital starting in FY 2020
- Scenario 4: $6,000,000 in capital starting in FY 2025 with increases in capital each year over a 6-year period

Figure 5.1 Comparison of Capital Funding Levels



Each of the scenarios was presented to the stakeholders in the form of tables showing the revenue requirement for the program compared to the FY 2018 budget. The revenue requirement accounts for the increase in level of service for Stormwater Administration and Engineering Operations; Operation and Maintenance, as well as inflation, reserve funds, and debt service. It does not include inflation for the cost of future CIP projects. It was noted that the budget for Stormwater Administration in FY-year 2018 is inflated compared to normal years because funding for the Watershed Master Plans was included within that budget category. Because the City currently has a fund balance for the stormwater fund, the total reserve target of $1,500,000 can be achieved in FY2020 and cash flow models shown in section 5.3 reflect this and the devotion of all fund balances in excess of the reserve target toward additional capital.

Table 5.2 Scenario 1: $2,000,000 in capital starting in FY 2020

Revenue Requirements	FY 2018 Budgeted	FY2020	FY2021	FY2022	FY2023	FY2024
Stormwater Administration	$1,781,627	$535,583	$535,624	$535,625	$535,625	$535,625
Engineering Operations – Current	$662,291	$700,761	$720,932	$741,757	$763,261	$785,469
Engineering Operations – New	$0	$218,000	$222,360	$226,807	$231,343	$235,970
Operations and Maintenance – Current	$1,474,986	$1,569,844	$1,619,828	$1,671,606	$1,725,248	$1,780,829
Operations and Maintenance – New	$0	$769,378	$1,158,028	$1,165,801	$1,165,956	$1,165,959
Reserves	$0	$250,000	$250,000	$250,000	$250,000	$250,000
Debt Service	$481,274	$481,274	$2,053,106	$2,320,938	$2,320,938	$2,320,938
Rate Funded Capital – Current	$1,528,820	$1,685,524	$1,769,800	$1,858,290	$1,951,2005	$2,048,765
Capital Replacement/CIP – New	$0	$2,000,000	$2,00,000	$2,000,000	$2,000,000	$2,000,000
Total Revenue to be Recovered from Rates	*$5,928,998*	*$8,210,363*	*$10,329,677*	*$10,770,824*	*$10,943,576*	*$11,123,555*

Table 5.3 Scenario 2: $2,000,000 in capital starting in FY 2024, 5-year ramping

Revenue Requirements	FY 2018 Budgeted	FY2020	FY2021	FY2022	FY2023	FY2024
Stormwater Administration	$1,781,627	$535,583	$535,624	$535,625	$535,625	$535,625
Engineering Operations – Current	$662,291	$700,761	$720,932	$741,757	$763,261	$785,469
Engineering Operations – New	$0	$218,000	$222,360	$226,807	$231,343	$235,970
Operations and Maintenance – Current	$1,474,986	$1,569,844	$1,619,828	$1,671,606	$1,725,248	$1,780,829
Operations and Maintenance – New	$0	$769,378	$1,158,028	$1,165,801	$1,165,956	$1,165,959
Reserves	$0	$250,000	$250,000	$250,000	$250,000	$250,000
Debt Service	$481,274	$481,274	$2,053,106	$2,320,938	$2,320,938	$2,320,938
Rate Funded Capital – Current	$1,528,820	$1,685,524	$1,769,800	$1,858,290	$1,951,2005	$2,048,765
Capital Replacement/CIP – New	$0	$400,000	$800,000	$1,200,000	$1,600,000	$2,000,000
Total Revenue to be Recovered from Rates	*$5,928,998*	*$6,610,363*	*$9,129,677*	*$9,970,824*	*$10,543,576*	*$11,123,555*

Table 5.4 Scenario 3: $6,000,000 in capital starting in FY 2020

Revenue Requirements	FY 2018 Budgeted	FY2020	FY2021	FY2022	FY2023	FY2024
Stormwater Administration	$1,781,627	$535,583	$535,624	$535,625	$535,625	$535,625
Engineering Operations – Current	$662,291	$700,761	$720,932	$741,757	$763,261	$785,469
Engineering Operations – New	$0	$218,000	$222,360	$226,807	$231,343	$235,970
Operations and Maintenance – Current	$1,474,986	$1,569,844	$1,619,828	$1,671,606	$1,725,248	$1,780,829
Operations and Maintenance – New	$0	$769,378	$1,158,028	$1,165,801	$1,165,956	$1,165,959
Reserves	$0	$250,000	$250,000	$250,000	$250,000	$250,000
Debt Service	$481,274	$481,274	$2,053,106	$2,320,938	$2,320,938	$2,320,938
Rate Funded Capital – Current	$1,528,820	$1,685,524	$1,769,800	$1,858,290	$1,951,2005	$2,048,765
Capital Replacement/CIP – New	$0	$6,000,000	$6,000,000	$6,000,000	$6,000,000	$6,000,000
Total Revenue to be Recovered from Rates	*$5,928,998*	*$12,210,363*	*$14,329,677*	*$14,770,824*	*$14,943,576*	*$15,123,555*

Table 5.5 Scenario 4: $6,000,000 in capital starting in FY 2025, 6-year ramping

Revenue Requirements	FY 2018 Budgeted	FY2020	FY2021	FY2022	FY2023	FY2024
Stormwater Administration	$1,781,627	$535,583	$535,624	$535,625	$535,625	$535,625
Engineering Operations – Current	$662,291	$700,761	$720,932	$741,757	$763,261	$785,469
Engineering Operations – New	$0	$218,000	$222,360	$226,807	$231,343	$235,970
Operations and Maintenance – Current	$1,474,986	$1,569,844	$1,619,828	$1,671,606	$1,725,248	$1,780,829
Operations and Maintenance – New	$0	$769,378	$1,158,028	$1,165,801	$1,165,956	$1,165,959
Reserves	$0	$250,000	$250,000	$250,000	$250,000	$250,000
Debt Service	$481,274	$481,274	$2,053,106	$2,320,938	$2,320,938	$2,320,938
Rate Funded Capital – Current	$1,528,820	$1,685,524	$1,769,800	$1,858,290	$1,951,2005	$2,048,765
Capital Replacement/CIP – New	$0	$1,000,000	$2,000,000	$3,000,000	$4,000,000	$5,000,000
Total Revenue to be Recovered from Rates	*$5,928,998*	*$7,210,363*	*$10,329,677*	*$11,770,824*	*$12,943,576*	*$14,123,555*

The SWAC was also presented with the stormwater rates that would be required to fund the revenue requirement associated with each of the scenarios. The rates presented incorporated the rate alternative recommendations. The rates for each of the scenarios are presented in the tables below.

Table 5.6 Scenario 1: $2,000,000 in capital starting in FY 2020

Rate Calculation	FY2020	FY2021	FY2022	FY2023	FY2024	5-Year Average Rate
Administrative Rate per account per month	$1.20	$1.20	$1.20	$1.20	$1.20	**$1.20**
Rate per ERU per month	$8.64	$8.64	$8.64	$8.64	$8.64	**$8.64**
Total Rate	$9.84	$9.84	$9.84	$9.84	$9.84	**$9.84**

Table 5.7 Scenario 2: $2,000,000 in capital starting in FY 2024, 5-year ramping

Rate Calculation	FY2020	FY2021	FY2022	FY2023	FY2024	5-Year Average Rate
Administrative Rate per account per month	$1.20	$1.20	$1.20	$1.20	$1.20	**$1.20**
Rate per ERU per month	$5.50	$7.70	$8,37	$8.79	$9.21	**$7.91**
Total Rate	$6.70	$8.90	$9.57	$9.99	$10.41	**$9.11**

Table 5.8 Scenario 3: $6,000,000 in capital starting in FY 2020

Rate Calculation	FY2020	FY2021	FY2022	FY2023	FY2024	5-Year Average Rate
Administrative Rate per account per month	$1.20	$1.20	$1.20	$1.20	$1.20	**$1.20**
Rate per ERU per month	$12.19	$12.19	$12.19	$12.19	$12.19	**$12.19**
Total Rate	$13.39	$13.39	$13.39	$13.39	$13.39	**$13.39**

Table 5.9 Scenario 4: $6,000,000 in capital starting in FY 2025, 6-year ramping

Rate Calculation	FY2020	FY2021	FY2022	FY2023	FY2024	5-Year Average Rate
Administrative Rate per account per month	$1.20	$1.20	$1.20	$1.20	$1.20	**$1.20**
Rate per ERU per month	$6.04	$8.78	$9.97	$10.90	$11.82	**$9.50**
Total Rate	$7.24	$9.98	$11.17	$12.10	$13.02	**$10.70**

In addition to recommending rate alternatives, based on the revenue requirements and the rates presented for each of the scenarios, the SWAC developed recommendations for rates for the City to pursue moving forward. After much discussion, the SWAC felt that level of service scenario 4 was the most appropriate but utilizing rounded rates.

Recommendation: Increase utility rates over a 6-year period to reach the targeted amount using rounded rates as described in Table 5.10 below (Unanimous vote)

Table 5.10 SWAC recommended Stormwater Utility Rates

Rate Calculation	FY2020	FY2021	FY2022	FY2023	FY2024	5-Year Average Rate
Administrative Rate per account per month	**$1.20**	**$1.20**	**$1.20**	**$1.20**	**$1.20**	**$1.20**
Rate per ERU per month	**$6.00**	**$8.00**	**$10.00**	**$12.00**	**$14.00**	**$10.00**
Total Rate	**$7.20**	**$9.20**	**$11.20**	**$13.20**	**$15.20**	**$11.20**

5.3 Stormwater Utility Cash Flows

Using the rates recommended by the SWAC (presented in Table 5.10 above), a cash flow for the utility was modeled. This cash flow also includes the SWAC recommended increases in levels of service as well as the recommendations to establish a 1 ERU minimum and adding an administrative charge. Billing for vacant units was also included at a very conservative rate (assuming a successful collection rate of 33%) based on the SWAC's desire to pursue this option yet understanding that the ability to collect these fees was an unknown. The cash flow using the SWAC recommendations is presented in Table 5.11 below. However, capital expenses are expected to inflate at a rate faster than the rate base. If we assume that the new capital will inflate at a rate of 5% per year, by 2025 new capital spending will reach approximately $9,906,354. As a result of these additional expected capital costs, the SWAC felt that an increase up to $14 per ERU per month was warranted. Several SWAC members were also concerned that the cost of materials would potentially increase and that the cost to complete some of the capital projects would increase as well.

If the City maintains current rates, both stormwater capital investment and needed level of service increases will be reduced. Spending for all stormwater program elements would stay the same with the exception of capital spending. Currently the City spends approximately $1,500,000 in capital every year. In 2020 the City will begin to service the debt associated with the Town Creek Culvert. To maintain the current rates and to service the Town Creek Culvert debt, the annual investment in capital will have to be reduced to around $450,000 per year. This reduction in capital investment will significantly hinder the City's ability to complete other capital projects in a timely fashion. Moreover, the City will not be able to increase the level of service for program administration, engineering, and operations and maintenance which are considered essential to maintain and extend the longevity of the City's stormwater system and to prepare for extreme weather events.

"If the City maintains current rates, both stormwater capital investment and needed level of service increases will be reduced"

5.4 Bond Package and Debt Approach

Not including any regular capital or infrastructure replacement, the City has a Capital Improvement Program (CIP) that includes a list of projects and estimated costs that totals approximately $170,000,000. To fund these capital projects in a timely fashion, bonded debt options were considered. Projected debt coverage ratios were incorporated into the

model and were calculated under different rate alternatives as well as under the SWAC recommended rates. Current debt obligations including the Town Creek Culvert debt issuance were considered as well as different timing scenarios for debt issuances. Based on discussions with City staff, it was decided that while the City had capacity to issue bonded debt in one or multiple tranches, it was in the best interest of the City to not issue any additional debt at this time and to implement a pay as you go capital project funding strategy.

Recommendation: Not to pursue debt funding at this time (Unanimous vote)

Table 5.11 Stormwater Utility Cash Flow - SWAC Recommendations

Stormwater Fund	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Beginning Balance	$4,800,238	$4,661,810	$ 5,306,197	$ 2,110,325	$ 1,500,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	$ 1,500,000
Source of Funds (Fee per ERU)	($5.35)	($5.35)	($7.20)	($9.20)	($11.20)	($13.20)	($15.20)	($15.20)	($15.20)	($15.20)
Rate Revenues	$5,790,570	$5,848,476	$ 7,167,387	$ 9,469,352	$11,816,641	$14,209,928	$16,649,899	$16,816,398	$16,984,562	$17,154,407
Revenue Adjustments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Operating Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Non-Operating Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Debt Proceeds	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total - Sources of Funds	$5,790,570	$5,848,476	$ 7,167,387	$ 9,469,352	$11,816,641	$14,209,928	$16,649,899	$16,816,398	$16,984,562	$17,154,407
Uses of Funds										
Stormwater Administration	$1,781,627*	$ 533,868	$ 535,583	$ 535,624	$ 535,625	$ 535,625	$ 535,625	$ 535,625	$ 535,625	$ 535,625
Stormwater Street Maintenance	$1,459,986	$1,506,585	$ 1,554,844	$ 1,604,828	$ 1,656,606	$ 1,710,248	$ 1,765,829	$ 1,823,426	$ 1,883,120	$ 1,944,994
Stormwater Buildings & Grounds	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Stormwater Engineering	$ 662,291	$ 681,221	$ 700,761	$ 720,932	$ 741,757	$ 763,261	$ 785,469	$ 808,405	$ 832,099	$ 856,576
Engineering Operational - New	$ -	$ 118,080	$ 238,522	$ 359,010	$ 361,420	$ 361,468	$ 361,469	$ 361,469	$ 361,469	$ 361,469
Maintenance Operational - New	$ -	$ 262,800	$ 530,856	$ 799,017	$ 804,380	$ 804,488	$ 804,490	$ 804,490	$ 804,490	$ 804,490
Stormwater Engineering - New Override	$ -	$ -	$ 218,000	$ 222,360	$ 226,807	$ 231,343	$ 235,970	$ 240,690	$ 245,503	$ 250,413
Existing Debt Service	$ 481,274	$ 481,274	$ 481,274	$ 2,053,106	$ 2,320,938	$ 2,320,938	$ 2,320,938	$ 2,320,938	$ 2,320,938	$ 2,320,938
Proposed Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Rate Funded Capital	$1,528,820	$1,605,261	$ 1,685,524	$ 1,769,800	$ 1,858,290	$ 1,951,205	$ 2,048,765	$ 2,151,203	$ 2,258,763	$ 2,371,702
Fund Balance Capital	$ -	$ -	$ 3,402,896	$ -	$ 295,817	$ 1,516,351	$ 2,776,344	$ 1,755,151	$ 1,727,555	$ 1,693,200
Additional Capital	$ -	$ -	$ 1,000,000	$ 2,000,000	$ 3,000,000	$ 4,000,000	$ 5,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000
Total - Use of Funds	$5,928,998	$5,204,089	$10,363,259	$10,079,677	$11,816,641	$14,209,928	$16,649,899	$16,816,398	$16,984,562	$17,154,407
Ending Balance	**$4,661,810**	**$5,306,197**	**$ 2,110,325**	**$ 1,500,000**	**$ 1,500,000**	**$ 1,500,000**	**$ 1,500,000**	**$ 1,500,000**	**$ 1,500,000**	**$ 1,500,000**
Total Capital	$1,528,820	$1,605,261	$ 6,088,420	$ 3,769,800	$ 5,154,107	$ 7,467,556	$ 9,825,109	$ 9,906,354	$ 9,986,318	$10,064,902
*Note:	2018 Administration funding includes additional one time funding for watershed master planning									

6.0 Ordinance/Policy Revisions

Implementation of the recommendations of the SWAC may require revisions to the City's Code of Ordinances and current policies. The following possible revisions have been identified for consideration.

6.1 Extent of Service Modifications

6.1.1 Maintenance of infrastructure on non-City owned property

As part of the discussion on Extent of Service, the SWAC recommended that the City accept responsibility for those portions of the drainage system (excluding BMP's) that convey runoff

> *"Public Water – Is defined as stormwater runoff from improved publicly owned rights-of-way (including City and State streets and alleys) and City-owned property"*

from City property or "public water". The subsections of the current ordinance, Section 9-9-13- DRAINAGE PROJECTS LOCATED OUTSIDE OF CITY-OWNED RIGHTS-OF-WAY, sometimes references those portions of the system carrying stormwater from "existing city or state system streets" while other times expands the responsibility to include all "streets dedicated for public street purposes, including alleys". For Clarity and consistency, it is recommended that a single definition of "Public Water" be adopted as follows:

Public Water – Is defined as stormwater runoff from improved publicly owned rights-of-way (including City and State streets and alleys) and City-owned property.

6.1.2 Maintenance of infrastructure outside of the City's Corporate Limits

As part of the discussion on Extent of Service, the SWAC recommended that the City limit responsibility for infrastructure outside of the City's Corporate Limits to those situations where there is a direct benefit to the City and its residents. It is suggested that Subsection 9-9-14 – ACCEPTANCE OF RESPONSIBILITY FOR CERTAIN STORMWATER CONVEYANCES BY CITY, could be modified by adding a new Subsection 9-9-14 (C) to read: "The city may at its own discretion, accept responsibility for or assist in the repair or improvement of storm drainage

infrastructure located outside of the city's corporate limits where the City Engineer has determined that there is a direct benefit to the City and its residents."

(The following Ordinance/Policy Changes were not directly discussed by the SWAC but were identified as additional potential changes to be considered)

6.1.3 Clarify what is considered public water

The ordinances under Section 9-9-13 vary in how they define "public water". In some cases, they include all streets dedicated for public street purposes including alleys but in others they omit alleys. The ordinances also do not list any other City owned properties such as building lots, parks, etc. The City may want to consider modifying the ordinances to make their language uniform regarding public streets as well as to consider the specific inclusion or exclusion of large City owned properties such as airports, universities, military bases, parks, cemeteries, etc. (see recommended definition in 6.1.1)

6.1.4 Possible conversion of ordinances to policy

The City may want to consider converting the ordinances under Section 9-9-13 and 14 into Council Policies so that they may be more easily modified based on the current desires of the Council, so that the Council can approve variances to them should the need arise, and so that the City cannot be held responsible for strict adherence to them. Other communities, such as the City of Raleigh, have established many of the same intentions utilizing policies.

6.1.5 Clarify responsibility for natural streams

Section 9-9-14 establishes that the City will accept responsibility for necessary structures located within a city right-of-way in four (4) natural streams. However, it appears the intent was to accept responsibility for maintaining flow even on private property. If that is the case, then this section needs to be modified to clarify that responsibility

6.1.6 – Clarify the determining authority

The ordinances under 9-9-13 & 14 vary in their reference to decisions by the Director of PW, City Engineer, and City Engineering Division. It is suggested that a single entity be identified and used throughout this and any other drainage related ordinances.

6.2 Billing and Rate Structure Modifications

The establishment of the Greenville Stormwater Management Utility is contained the in the Greenville Code of Ordinances Title 8 Chapter 3. Several changes to the Code of Ordinances will be required to implement the billing and rate structure recommendations made by the SWAC.

6.5.1 Section 8-3-2 Definitions

- Add a definition for Administrative charge

6.5.2 Section 8-3-6 Schedule of Fees and Charges

- Language should be added on the administrative charge specifying the "Charge per Account." The Charge per Account section will reference the Manual Fees where the actual fees are contained.
- Language should be added specifying that there is a minimum charge of 1 ERU.

6.5.3 Section 8-3-7 Billing and Collection

- Currently there is nothing in the ordinance that specifies how vacant units are handled with regards to charging the stormwater fee. Should the City decide to bill for vacant units, either through GUC or through some other billing method, language will need to be added to specify that vacant units will be charged the stormwater fee and how they will be billed.

7.0 Capital Spending Plan

7.1 Watershed Master Planning Process

The City, with the assistance of several consulting engineering firms, completed 7 Watershed Master Plans by 2016 that encompass the major watersheds within the City's jurisdiction. The purpose of these studies was to identify and develop potential solutions for identified flooding, stream erosion, and water quality concerns. As part of these Master Plans, preliminary designs, along with estimated final design and construction costs, were developed for the identified concerns. The anticipated projects were then prioritized based on their criticality including; public health and safety; severity of street flooding, cost effectiveness; effect of improvements; water quality; open channel stream stabilization; implementation constraints; availability of grant funding; and constructability. The total estimated cost for implementing all the identified projects approached $170 million dollars.

7.2 Recommended Capital Spending Plan

The Stormwater Advisory Committee was presented a short list of capital projects in detail. These projects highlighted included projects from the Watershed Master Plans and staff's current list of condition repair/replacement projects.

Projects were selected based on:

- the priority ranking in the watershed master plans,
- projected available funding, grant or outside funding availability,
- coordination with other current projects such as resurfacing, and
- urgency or potential infrastructure failure.

These projects were each presented showing the current condition, future conditions, and proposed improvements with a detailed cost estimate for planning, design, and construction. The Stormwater Advisory Committee concurred with staff that these projects are needed and should be planned for completion as soon as funding allows.

Using the modeled cash flow from the rates recommended by the SWAC, the list of priority projects presented to the SWAC was scheduled into a 6-year capital spending plan using a pay-go approach. Available capital funding each year was determined based upon projected annual revenues and Stormwater Utility Fund Balance. A reserve minimum fund balance of $1,500,000 was maintained each year through the capital spending plan. Projects were scheduled based upon available funds at the beginning of each project

phase, duration of project phases, and with consideration to staff and contractor workloads. The SWAC also determined it was important to include updates to the watershed master plans and an additional utility rate study near the end of the 6-year plan. This capital spending plan was mapped onto a Gant chart presented in Table 7.1 below. The Stormwater Advisory Board unanimously concurred with staff on the recommended spending plan as shown.

Recommendation: Projects should be scheduled and prioritized based upon the presented capital plan shown in Table 7.1. (Unanimous vote)

Table 7.1 - SWAC Capital Projects Gant Chart

		FY 2020												FY 2021											
Project	Total Costs	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
Available Funds		$3,900K												$3,700K + $508K = **$4,208K**											
(SS15) St Andrews	$3,432K				(SS15) St Andrews $792K									(SS15) St Andrews $2,640K											
(S3) Cedar Lane	$1,000K		(S3) Cedar Lane $60K					(S3) Cedar Lane $198K					(S3) Cedar Lane $742K												
(SS25) Cedar Lane	$400K																								
(SS29) Elm Street	$3,310K																								
(P14A/SS26) GMR (Benching)	$570K																								
(SS6) Forest Hill Drive	$822K																								
(P9A Swift Creek (Detention Pond)	$7,630K																								
(P14B/SS26) GMR	$3,780K																								
(S1) Greenbriar	$770K																								
(P9B) Swift Creek (Culvert)	$420K																								
(P14C/SS16) GMR	$1,640K																								
Watershed Master Plan Update	$750K																								
Utility Rate Study	$50K																								
(S2 & S5) Lynndale Phase I & II	$5,067K																								
(OC) On-Call Contract (Condition)	$1,500K/yr	(OC) On-Call Contract (Condition) $1,500K												(OC) On-Call Contract (Condition) $1,500K											
Bank Stabilization (Private Property)	$200K/yr	Bank Stabilization (Private Property) $100K												Bank Stabilization (Private Property) $100K											
Total Capital Expeditures		$3,392K												$4240K											
Remaining Available Capital Funds to forward to next year		$508K												-$32K											

Table 7.1 (continued) - SWAC Capital Projects Gant Chart

		FY 2022												FY 2023											
Project	Total Costs	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Available Funds		$5,100K - $32K = **$5,068K**												$7,400K + $1,086K = **$8,486K**											
(SS15) St Andrews	$3,432K																								
(S3) Cedar Lane	$1,000K																								
(SS25) Cedar Lane	$400K		**(SS25) Cedar Lane $92K**					**(SS25) Cedar Lane $308K**																	
(SS29) Elm Street	$3,310K	**(S29) Elm Street $60K**				**(SS29) Elm Street $700K**								**(S29) Elm Street $2,550K**											
(P14A/SS26) GMR (Benching)	$570K					**(P14A/SS26) GMR (Benching) $130K**											**(P14A/SS26) GMR (Benching) $440K**							
(SS6) Forest Hill Drive	$822K		**(SS6) Forest Hill Drive $190K**					**(SS6) Forest Hill Drive $632K**																	
(P9A Swift Creek (Detention Pond)	$7,630K					**(P9A) Swift Creek (Dentention Pond) $170K**								**(P9A) Swift Creek (Dentention Pond) $1,920K**										
(P14B/SS26) GMR	$3,780K																				**(P14B/SS26) GMR $880K**				
(S1) Greenbriar	$770K																								**(S1) Greenbriar $178K**
(P9B) Swift Creek (Culvert)	$420K																								
(P14C/SS16) GMR	$1,640K																								
Watershed Master Plan Update	$750K																								
Utility Rate Study	$50K																								
(S2 & S5) Lynndale Phase I & II	$5,067K																								
(OC) On-Call Contract (Condition)	$1,500K/yr	**(OC) On-Call Contract (Condition) $1,500K**												**(OC) On-Call Contract (Condition) $1,500K**											
Bank Stabilization (Private Property)	$200K/yr	**Bank Stabilization (Private Property) $200K**												**Bank Stabilization (Private Property) $200K**											
Total Capital Expeditures		**$3,982K**												**$7,668K**											
Remaining Available Capital Funds to forward to next year		**$1,086K**												**$818K**											

Table 7.1 (continued) - SWAC Capital Projects Gant Chart

		FY 2024												FY 2025											
Project	Total Costs	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25
Available Funds		$9,800K +$818K = **$10,618K**												$9,900 -$2K = **$9,898K**											
(SS15) St Andrews	$3,432K																								
(S3) Cedar Lane	$1,000K																								
(SS25) Cedar Lane	$400K																								
(SS29) Elm Street	$3,310K																								
(P14A/SS26) GMR (Benching)	$570K																								
(SS6) Forest Hill Drive	$822K																								
(P9A Swift Creek (Detention Pond)	$7,630K	(P9A) Swift Creek (Dentention Pond) $5,540K																							
(P14B/SS26) GMR	$3,780K				(P14B/SS26) GMR $2,900K																				
(S1) Greenbriar	$770K																(S1) Greenbriar $592K								
(P9B) Swift Creek (Culvert)	$420K						(P9B) Swift Creek (Culvert) $100K							(P9B) Swift Creek (Culvert) $320K											
(P14C/SS16) GMR	$1,640K										(P14C/SS16) GMR $380K								(P14C/SS16) GMR $1,260K						
Watershed Master Plan Update	$750K													Watershed Master Plan Update $750K											
Utility Rate Study	$50K													Utility Rate Study $50K											
(S2 & S5) Lynndale Phase I & II	$5,067K															(S2, S5 and S6) Lynndale Phase I, II and III $1,660K								(S2 & S5) Lynndale Phase I &II $3,407K	
(OC) On-Call Contract (Condition)	$1,500K/yr	(OC) On-Call Contract (Condition) $1,500K												(OC) On-Call Contract (Condition) $1,500K											
Bank Stabilization (Private Property)	$200K/yr	Bank Stabilization (Private Property) $200K												Bank Stabilization (Private Property) $200K											
Total Capital Expeditures		**$10,620K**												**$9,739K**											
Remaining Available Capital Funds to forward to next year		**-$2K**												**$159K**											

Appendices

APENDIX – A

Ordinances Related to Private Drainage Maintenance

SEC. 9-9-13 DRAINAGE PROJECTS LOCATED OUTSIDE OF CITY-OWNED RIGHTS-OF-WAY.

(A) ***Drainage projects on ditches or non-jurisdictional streams; piping.*** **The city will participate with property owners in the installation of storm drains crossing private property in other than new subdivisions within the city's corporate limits under the following conditions:**

(1) The storm drains to be installed will carry stormwater discharged from an existing city or state street or streets dedicated for public street purposes, including alleys, and accepted for maintenance by the city or state. Storm drainage systems not meeting this requirement are the responsibility of the property owner(s) and the city will not participate in the installation of such storm drains.

(2) An application for the installation of storm drains must be signed by 100% of the owners of the affected property within the limits of the proposed project and submitted to the City Engineering Division.

(3) The property owners must dedicate a drainage easement of a width, length, and type as specified by the Director of Public Works. The dedication of such easement will be at no cost to the city.

(4) The shortest distance in which the city will participate in the installation of storm drainage will be 300 linear feet; any shorter distances than 300 linear feet must be deemed feasible by the City Engineering Division before city participation.

(5) All pipe sizes, structural accessories, discharge points and other specifications shall be as determined by the City Engineering Division.

(6) The city will furnish all labor and equipment and the adjoining property owners will pay for all materials for construction. These materials shall be as determined necessary by the City Engineering Division and shall include headwalls, manholes, catch basins and all other structures normal to a complete storm drainage system. All monies for materials must be deposited by property owners before construction is started.

(7) All authorized work shall be performed by the city, its agents and/or contractors. The city will direct all necessary activities including but not limited to design, engineering, contracting, and construction.

(8) Nothing in this subsection (A) shall be construed, interpreted or applied in a manner to mean that the city will participate in any way in the construction of any box culvert or other structure to be built or constructed in place. The piping of streams shall be restricted in all instances to that drainage where pre-cast or preassembled pipe will be of sufficient capacity, as calculated by the City

Engineering Department, for the piping and enclosing herein mentioned and contemplated.

(9) Cost for each property owner shall be determined by dividing the total cost of materials by the total footage of property owners adjoining the proposed pipe locations directly and multiplying the result by the footage of each individual owner to determine his share of the cost.

(10) All storm drainage construction on private property shall be done on a scheduled basis so as not to interfere with other city projects and then only as budgeted funds of the city are available.

(11) The city will not participate in the construction of any storm drainage systems which will require a pipe size larger than 48 inches due to the greatly increased cost of labor, equipment and engineering required due to the use of box culverts, paved channels and other types of solutions.

(B) ***Drainage projects on ditches or non-jurisdictional streams; erosion.*** **The city will stabilize banks on ditches or non-jurisdictional streams crossing private property in other than new subdivisions within the city's corporate limits under the following conditions:**

(1) The ditch or non-jurisdictional stream carries stormwater discharged from an existing city or state street or streets dedicated for public street purposes, including alleys, and accepted for maintenance by the city or state. Storm drainage systems not meeting this requirement are the responsibility of the property owner(s) and the city will not participate in such drainage projects.

(2) An application for bank stabilization must be signed by 100% of the owners of the affected property within the limits of the proposed project and submitted to the City Engineering Division.

(3) The property owners must dedicate a drainage easement of a width, length, and type as specified by the Director of Public Works. The dedication of such easement will be at no cost to the city.

(4) Materials and construction methods shall be as determined necessary by the City Engineering Division. All
authorized work shall be performed by the city, its agents and/or contractors. The city will direct all necessary activities including but not limited to design, engineering, contracting, and construction.

(5) All drainage projects on private property shall be done on a scheduled basis so as not to interfere with other city projects and then only as budgeted funds of the city are available.

(C) ***Drainage projects on jurisdictional streams; piping.*** **The city will not participate in the piping of jurisdictional streams.**

(D) ***Drainage projects on jurisdictional streams; erosion.*** **The city will stabilize or restore banks crossing private property in other than new subdivisions within the city's corporate limits under the following conditions:**

(1) The jurisdictional stream carries stormwater discharged from an existing city or state street or streets dedicated for public street purposes, including alleys, and accepted for maintenance by the city or state. Storm drainage systems not meeting this requirement are the responsibility of the property owner(s) and the city will not participate in such drainage projects.

(2) An application for bank stabilization or stream restoration must be signed by 100% of the owners of the affected property within the limits of the proposed project.

(3) The property owners must dedicate a drainage easement of a width, length, and type as specified by the Director of Public Works. The dedication of such easement will be at no cost to the city.

(4) Materials and construction methods shall be as determined necessary by the City Engineering Division. All authorized work shall be performed by the city, its agents and/or contractors. The city will direct all necessary activities including but not limited to design, engineering, contracting, and construction.

(5) All drainage projects on private property shall be done on a scheduled basis so as not to interfere with other city projects and then only as budgeted funds of the city are available.

(E) Drainage assistance projects listed in subsections (A), (B) and (D) above may be funded with stormwater utility funds or other funds provided that all of the following eligibility criteria are met:

(1) The drainage system is not part of a water quality treatment facility or water quantity control device that was required to be constructed and maintained as part of an approved development.

(2) The drainage system is not located on property which is undergoing development or redevelopment unless the development/redevelopment project is funded in part by other city funds.

(3) The project shall be the most cost effective, reasonable and practical alternative to correct the existing problem, as determined by the Director of Public Works. Any excess costs above the determined most cost effective, reasonable and practical alternative shall be borne entirely by the property owner. Design criteria shall meet, but are not limited to, the following criteria:

(a) The proposed project shall meet current city stormwater design standards to the maximum extent practical;

(b) Existing ditches or non-jurisdictional streams shall not be piped unless engineering reasons require such work or significant cost savings would be realized; and

(c) Jurisdictional streams and their associated buffers shall be protected to the maximum extent practical.

(4) The application of the above factors and the determination as to eligibility for stormwater utility funding or other funding shall be made by the Director of Public Works. Property owners may appeal any decision by the Director of Public Works to the City Manager. If property owners are not satisfied with the decision of the City Manager, property owners may appeal any decision by the City Manager to City Council.

(F) Storm drainage crossing private property, which does not carry storm drainage from existing city or state system streets, dedicated for public street purposes and accepted for maintenance by the city or state, is the responsibility of the property owners and the city will not participate in the installation of storm drains therefore.

(G) No action or inaction of the city pursuant to the policy established by this section shall impose upon the city, its agents, officers or employees any responsibility of liability of any kind, past or future, relating to any person or property. The petitioners shall agree to covenant to and hold the city harmless from any death, personal injury or property damage resulting from the work. No such action by the city shall be considered as a taking or appropriation of any stream, drain or ditch as a part of the city's drainage system.

(H) The conditions set forth in this section shall be binding on the heirs, successors, assigns and grantees of the property owners.

(I) Nothing in this section shall be construed, interpreted or applied in such manner as to aid or assist in the subdivision or development of property in the city. The policy set out herein shall be applicable only to those properties for which no new subdivision or development is anticipated or planned.

(J) The intent of this section is not to transfer responsibility or liability to the city for drainage system components on property not owned by the city that carry stormwater. Rather, it is to establish criteria and priorities to be used when making available funds for work on drainage system components located outside of city-owned rights-of-way.

(K) City participation in work on drainage system components outside of the right-of-way is limited to the extent to which funds are available for such purpose and no entitlement to receive funds for such work arises from this section. (Ord. No. 11-006, § 4, passed 1-13-2011)

SEC. 9-9-14 ACCEPTANCE OF RESPONSIBILITY FOR CERTAIN STORMWATER CONVEYANCES BY CITY.

(A) The city accepts the responsibility for the maintenance, upkeep and installation of necessary structures, located within a city right-of-way within the city's corporate limits and not within a state right-of-way, in the following natural streams as listed below:

(1) Greens Mill Run, Tar River westerly to city limits west of Memorial Drive;

(2) Fornes Branch, from Greens Mill Run to NC 43;

(3) Reedy Branch, from Greens Mill Run to Greenville Boulevard; and

(4) Any other jurisdictional stream located within the city's corporate limits in which the city has participated in a drainage project pursuant to the provisions of this chapter only within the limits of such project.

(B) The responsibility of the city for the maintenance of streams, located within the city's corporate limits and not within a state right-of-way, includes only the removal of trees that block the flow of the stream. The city will only remove that portion of a tree that is blocking or is an imminent threat to block stream flow. Property owners are responsible for maintaining the vegetation to the standards established by the state (riparian buffer rule). Removal of trash in a stream is the property owner's responsibility including in any adjoining right-of-way. (Ord. No. 11-006, § 5, passed 1-13-2011)

APPENDIX-B
Level of Service Programs for Assigning Grades

Program Management	current level of service	promised level of service	desired level of service per SWAC
Administration/management			
Billing/finance/auditing			
Stormwater complaint/information request response			
Planning (strategic and master planning)			
Floodplain regulation			
Design			
Construction project management			
Water quality/NPDES compliance			
Illicit discharge detection, elimination, and enforcement			
Construction and post-construction inspection/enforcement			
Asset management/system inventory			

Annual Operations and Maintenance	current level of service	promised level of service	desired level of service per SWAC
Inlet/manhole (closed system) inspection, cleaning and minor repairs			
Pipe (closed system) inspection, cleaning, and minor repairs			
Roadway culvert (open system) inspection, cleaning and minor repairs			
Bridge (open system) inspection and minor repairs			
Ditch (open system) inspection and cleaning			
Public dam inspection and minor repairs			
Public BMP inspection and minor repairs			
Stream inspection and clearing			
Street sweeping/litter control			
Private drainage assistance			

Capital Improvement Program (CIP)	current level of service	promised level of service	desired level of service per SWAC
Engineering & construction for replacement of aging and failing pipe systems			
Engineering & construction for increasing capacity of primary (major) open channel systems, pipe systems, and culverts under roadways			
Engineering & construction for increasing capacity of secondary neighborhood pipe systems and ditches			
Engineering and new construction of water quality retrofits			
Restoration and stabilization of eroding streams			

APPENDIX-C
Results of Level of Service Poll

	CURRENT		PROMISED		DESIRED	
	SWAC	Staff	SWAC	Staff	SWAC	Staff
Program Management						
Administration / management	C+	B-	B-	B-	B+	B+
Billing / finance / auditing	C+	D	C+	B-	B	B+
Stormwater complaint / information request response	C	C+	B	B	B	A-
Planning (strategic and master planning)	C+	B-	B-	B-	B	A-
Floodplain regulation	C+	C+	B-	B	B	B+
Design	B-	C	B	C+	B	B-
Construction project management	C+	C+	B-	C+	B	B-
Water quality / NPDES compliance	C+	C-	B	C+	B	B+
Illicit discharge elimination / violation enforcement	C+	D+	B-	C	B	B+
Construction and post-construction inspection / enforcement	B-	D	B-	C	B	A-
Asset management / system inventory	C+	D+	B-	C	B	B+
Average for all Program Mang	C+	C	B-	C+	B	B+

	CURRENT		PROMISED		DESIRED	
	SWAC	Staff	SWAC	Staff	SWAC	Staff
Annual Operations and Maintenance						
Inlet / manhole (closed system) inspection, cleaning and minor repairs	B-	C+	B-	C+	B	B
Pipe (closed system) inspection, cleaning, and minor repairs	C+	C+	B-	C+	B	B
Roadway culvert (open system) inspection, cleaning and minor repairs	C	B-	B-	B-	B-	B+
Bridge (open system) inspection and minor repairs	C	B-	B-	B-	B	B+
Ditch (open system) inspection and cleaning	C-	B	B-	B	B	B+
Public dam inspection and minor repairs	C	C-	C+	C	B-	C+
Public BMP inspection and minor repairs	B-	D-	B-	B-	B	B
Stream inspection and clearing	C-	B-	C+	B	B	B
Street sweeping/litter control	B	B	B	B	B	B
Private drainage assistance	C-	E+	C-	D	C+	D-
Average for all O&M	C	C	C+	C+	B	B

	CURRENT		PROMISED		DESIRED	
	SWAC	Staff	SWAC	Staff	SWAC	Staff
Capital Improvement Program (CIP)						
Engineering & construction for replacement of aging and failing pipe systems	B-	D+	B	C-	B+	C+
Engineering & construction for increasing capacity of primary open channel systems and culverts	C	E	C	D-	B	C
Engineering & construction for increasing capacity of secondary neighborhood pipe systems and ditches	C-	E+	B-	D-	B	C
Engineering and new construction of water quality retrofits	C	E	B+	D-	B-	C
Restoration and stabilization of eroding streams	C-	C	B-	C	B	B
Average for all CIP	C	D-	B	D	B	C+

APPENDIX D

Minutes of Stormwater Advisory Committee Meetings

Reconvened Meetings Starting with Meeting #3 October 3, 2017