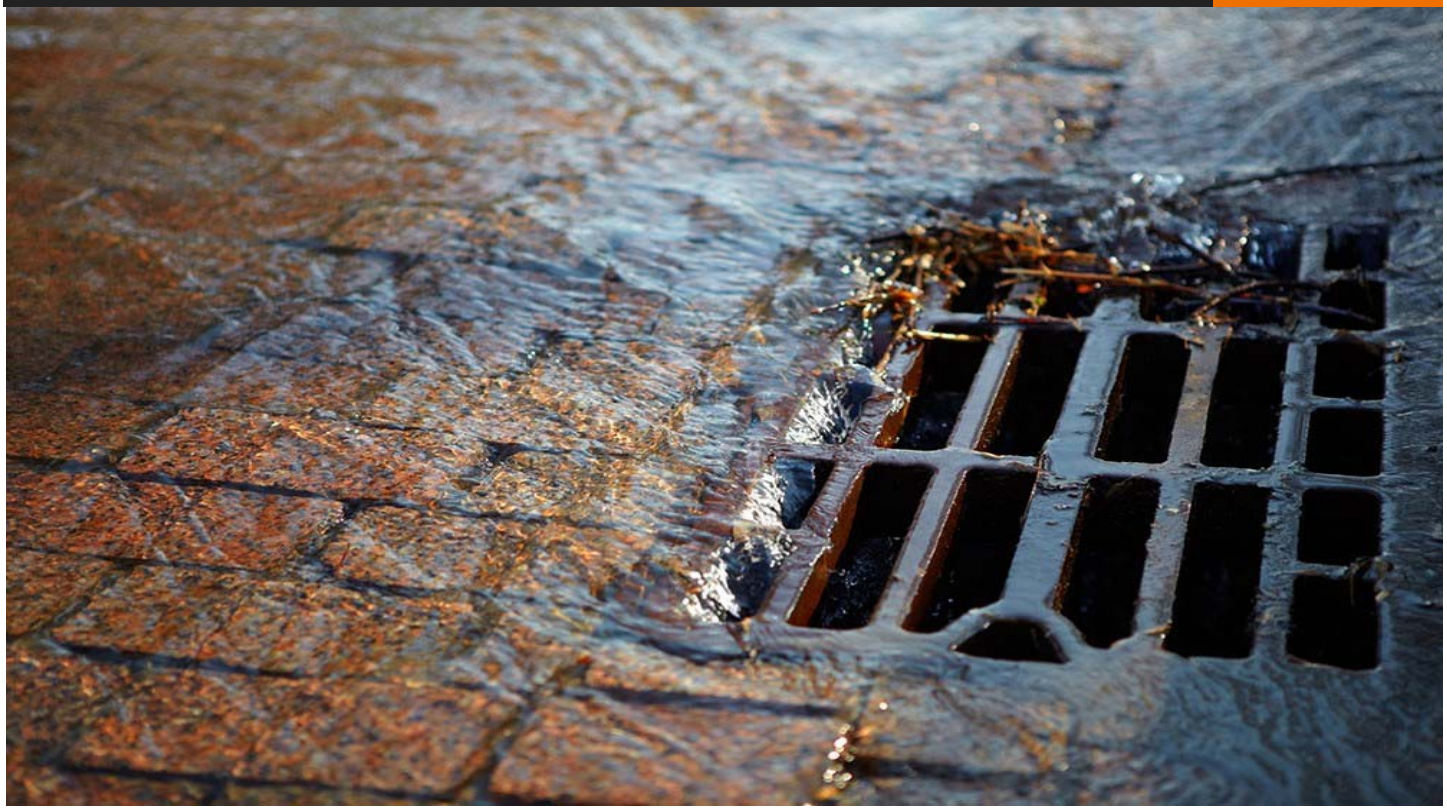
Stantec

City of Annapolis

Stormwater Utility Rate Study

July 20, 2018



July 20, 2018

Ms. Melissa Leaman
Acting Finance Director
City of Annapolis
160 Duke of Gloucester St.
Annapolis, MD 21401

Re: Stormwater Rate Study Update – Draft Report

Dear Ms. Leaman

Stantec is pleased to present this Draft Report on the Stormwater Water Utility Rate (Study) that we performed for the City of Annapolis ("City"). We appreciate the professional assistance provided by you and all of the members of the City staff who participated in the Study.

If you have any questions, please do not hesitate to call us at (202) 585-6391. We appreciate the opportunity to be of service to the City of Annapolis, and look forward to the possibility of doing so again in the near future.

Sincerely,

David A. Hyder
Principal

1101 14th Street NW Suite 1200
Washington DC 20005
(202) 585-6391
david.hyder@stantec.com

Enclosure

TABLE OF CONTENTS

1. Introduction 2

1.1 Background 2

1.2 Study Objectives 4

2. Current and Projected Revenue Requirements 5

2.1 Source Data and Assumptions 6

2.1.1 Source Data 6

2.1.2 Current Revenues 6

2.1.3 Operating Expenditures 6

2.1.4 Existing Debt Service 7

2.1.5 Capital Improvement Program 7

2.1.6 Total Stormwater Revenue Requirements 8

2.1.7 Minimum Reserve Policy 9

2.2 Financial Plan Development 9

3. Stormwater Fee Structure Analysis 14

3.1 Basis for Stormwater Rates 14

3.2 Current Rate Structure 14

3.3 Stormwater Rate Structure Evaluation 15

3.3.1 Alternative Fee Structure Development 15

3.3.2 ERU Calculation 16

3.3.3 Stormwater Fee Determination 19

3.3.4 Property Owner Impacts 19

4. Conclusions and Recommendations 21

4.1 Financial Plan 21

4.2 Stormwater Fee Structure 22

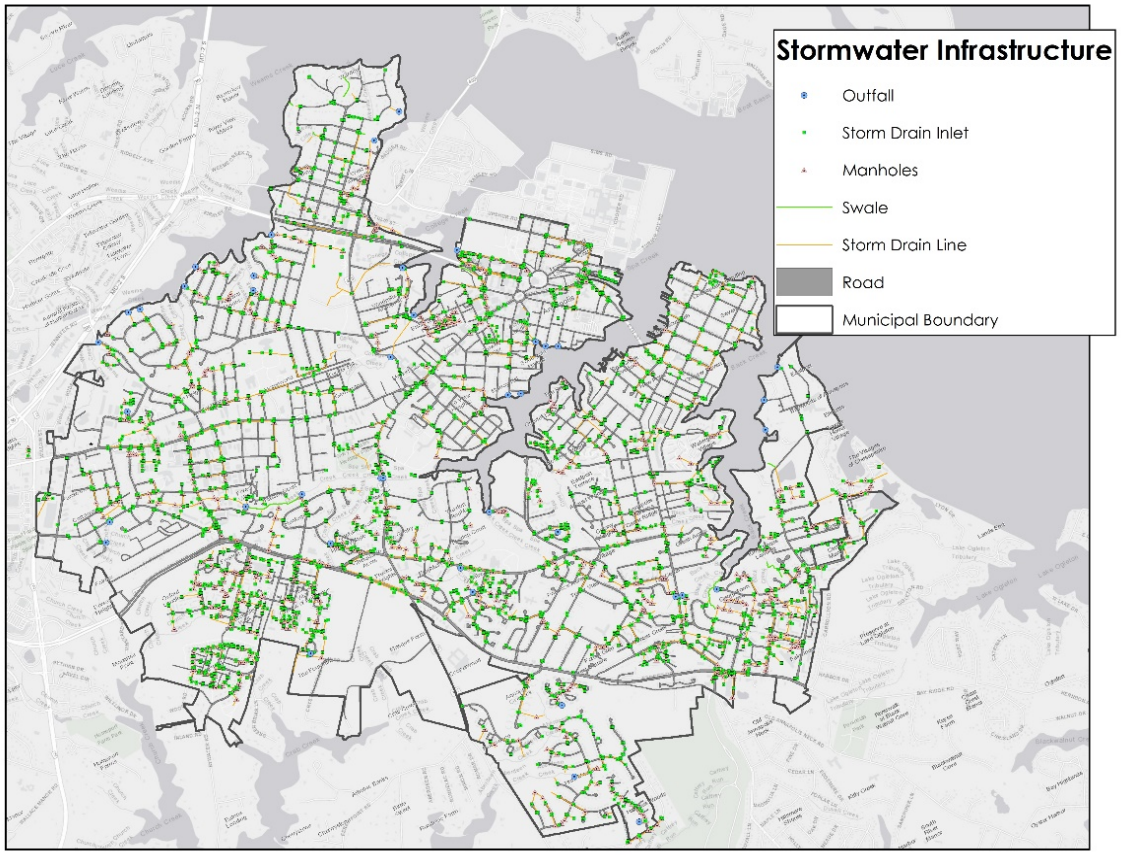
1. INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has conducted a Rate Study (Study) for The City of Annapolis's Stormwater Management Fund (hereafter referred to as the "City" or "Utility"). This report presents the results of the comprehensive Study, including background information, an explanation of the calculation methodology employed, and the results of the analysis.

1.1 BACKGROUND

The City of Annapolis (City) manages an extensive stormwater system. The system includes over 58 miles of pipes and culverts, 1,192 manholes, 41 outfalls, 307 miles of roadway curb and gutters, and 2,439 inlets and catch basins that ultimately convey stormwater in the community to the Chesapeake Bay. The City is located in both the Severn River and South River Watersheds. The City's stormwater system provides essential services within the community by protecting individual and personal property, and reducing the impacts of urban runoff to the natural environment, specifically the Chesapeake. Within the City, stormwater management also includes regulatory compliance and programming, forestry for street trees, green infrastructure to comply with the regional MS4 Permit, and public education/outreach. Figure 1, on the following page, presents an overview of the extensive nature of the City's stormwater system.

Figure 1. City-Wide Stormwater Infrastructure Managed by the Stormwater Program



The City's stormwater system discharges into local surface waters. As such, it is subject to the Clean Water Act which requires the City to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) program. The NPDES program is administered locally by the Maryland Department of Environment (MDE). The program requires regulated entities to comply with the Municipal Separate Storm Sewer System (MS4) General Permit. The MS4 Permit requires specific activities to be undertaken within the community to manage the stormwater system discharges. The activities are typically referred to as the "six minimum control measures" and consist of the following:

- Public Education and Outreach
- Public Participation / Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Site Stormwater Runoff Control
- Pollution Prevention / Good Housekeeping

During the course of this study, the City received its' new Phase II MS4 permit which includes the Chesapeake Bay Total Maximum Daily Load (TMDL) goals. The new permit requires that the City to treat 20 percent of the unmanaged impervious area within the City. In preparation for compliance with the new permit, the City engaged an engineering consultant to complete a stormwater management inventory and watershed improvement plan (WIP). The study was completed in October of 2016. As part of the WIP, the consultant identified a number of projects that will need to be completed by the City over the coming years. At this time, the City is developing a strategy that will outline how to move forward with the individual projects identified in the WIP in light of the requirements of the new MS4 permit.

Stormwater management within the City is provided primarily by the City's Public Works Department. The Department manages the majority of the aspects of the system including maintenance and regulatory compliance. Other departments within the City also provide some support for the stormwater system. The City maintains a separate Stormwater Management Enterprise Fund to account the expenditures and revenues generated to fund the operations and maintenance of the stormwater system. The revenues within the Fund are generated primarily from a stormwater fee that is assessed to property owners within the City on a quarterly basis. In anticipation of the additional funding needs to meet the City's new permit, the City increased the stormwater fee by approximately 50% in FY18. Prior to this increase, the fee had remained constant for the past 10 years.

To assist with the development of a long-term financial plan, the City engaged Stantec Consulting Services to complete a stormwater utility rate study. The remaining sections of this Report outline the study.

1.2 STUDY OBJECTIVES

The objectives of this Study are to:

1. Develop a financial model to evaluate the stormwater utility's revenue requirements, the sufficiency of the existing stormwater fees, and any necessary adjustment to stormwater fees to achieve the City's required level of service.
2. Develop and establish a GIS Master Impervious Surface Data to Parcel Layer to evaluate the impervious area on parcels within the City.
3. Conduct a detailed analysis of stormwater fee alternatives with recommendations as to the most viable fee structure suitable for the City.
4. Develop preliminary system-wide cost and revenue projections for the City's stormwater utility program.

2. CURRENT AND PROJECTED REVENUE REQUIREMENTS

This section of the report documents Stantec's review of the existing and projected budget for stormwater management within the City to provide an understanding of revenue requirements of the stormwater system based on the current and projected level of service. The review is based on historical spending, projected budgets established by the City, and includes system capital costs that were developed as part of the 2016 Stormwater Management Inventory and Watershed Improvement Plan (WIP), as well as the additional annual maintenance costs associated with the capital projects.

This section presents our revenue sufficiency analysis (RSA) for the City's stormwater program. The analysis examines the ability of the stormwater system to fund the revenue requirements of the system with current stormwater fee, and any necessary adjustments required to ensure revenue sufficiency. The following sub-sections of the report present a description of the source data, assumptions, and results of the RSA.

In order to populate the financial model, we reviewed the City's historical and budgeted financial information regarding the operation of its stormwater system. We also reviewed the City's multi-year capital improvement programs (CIP), and documented the City's current debt service obligations and covenants, or promises made to lenders, relative to net income coverage requirements and any necessary reserves. We also counseled with City staff regarding other assumptions and policies that would affect the financial performance of the Utility, such as staffing changes, incremental operating costs associated with the City's new MS4 permit and other factors that might impact system expenditures and/or revenues. We also examined historical spending levels (budget to actual) to determine if the City has historically executed its budget, and if any adjustments to future spending levels should be made. Finally, we completed a detailed review of the historical number of property owners billed to develop a baseline for forecasting future revenues.

All of this information was entered into our stormwater financial model. The model was loaded and reviewed for accuracy. The projection period within the model was developed to provide a full ten-year projection period (Fiscal Year 2019 to 2028).

Once the financial model was reviewed and updated, we reviewed alternative multi-year financial management plans and corresponding stormwater rate revenue adjustment plans through an interactive work session with City staff. During the work session, we examined the impact of various inputs or assumptions upon key financial indicators. The work session focused on the capital improvement plan, including funding sources and spending levels. Each of the scenarios were evaluated in light of key financial metrics for the Utility including cash reserves, and customer

bill impacts. After discussions and scenario analysis, we developed the recommended financial management plan and corresponding plan of annual stormwater revenue adjustments presented in this report. The financial plan was developed for the full 10-year projection period with recognition that the City will evaluate the plan annually, and make adjustments as necessary given changing conditions within the Utility.

2.1 SOURCE DATA AND ASSUMPTIONS

The following presents the key source data and assumptions relied upon in conducting the RSA.

2.1.1 Source Data

The FY 2017 Comprehensive Annual Financial Report (CAFR) provided by City staff was used to establish the beginning FY 2018 balances for City's stormwater system. As of the end of year FY 2017, the City had approximately $1.3 million in total fund balance.

2.1.2 Current Revenues

The revenues utilized in the RSA reflect an evaluation of multiple years of historical results. Revenues consist of fee revenue and interest income. FY 2018 fee revenue is based upon FY 2018 budgeted amount with interest earnings on fund balances, starting at 1.25% in FY18, increasing .25% each year until FY2021 where rates are held at 2%. To evaluate the sufficiency of current revenues to meet the funding requirements of the stormwater system, the revenues are forecasted at current fee with no growth in customer accounts.

Projected revenues at current stormwater fees are shown below in Table 2-1 over the next five years.

Table 2-1 Stormwater Projected Revenues at Current Stormwater Fees (millions)

	FY 19	FY 20	FY 21	FY 22	FY 23
Stormwater Fee Revenues	$1.5	$1.5	$1.5	$1.5	$1.5

2.1.3 Operating Expenditures

The Utility's operating expenditures include all operating and maintenance expenses, transfers, debt service requirements, and minor capital outlay. The RSA based operating expenditure projections on the individual expense categories and expense amounts within the FY 2018 Adopted Budget and the FY 2019 Proposed Budget, adjusted annually thereafter based upon assumed cost escalation factors that were reviewed with City staff (with the exception of annual debt service expenses which reflect the repayment schedules of each outstanding bond/loan).

Based on a historical review of the City's budget to actual spending, no adjustment was made within the forecast as the Utility has historically not over-budgeted.

In addition to the budgeted expenses, incremental O&M expenses from the implementation of BMPs from the 2016 WIP as well as approximated expenses associated with maintenance of existing BMPs have been included in our analysis. Incremental O&M spending increases each year and is tied to the completion of the projects from the WIP, with labor costs escalating using the same operating escalation factor as budgeted O&M projects. City staff provide an estimate for the maintenance of existing BMPs. The City anticipates beginning work on the existing BMPs in FY 23 at a cost of approximately $100,000 on an annual basis.

2.1.4 Existing Debt Service

The City currently has three outstanding debt service issuances for public improvements that include funding for the stormwater program. The annual debt service amortization schedules for all existing stormwater obligations were provided by City staff and included in the RSA. The annual debt payments are minimal at approximately $30,000 per year with reductions as the debt service is retired.

2.1.5 Capital Improvement Program

City staff provided the multi-year Capital Improvement Program (CIP) in project level detail from FY 2019 through FY 2024. The City's five-year (FY19 - FY24) CIP includes approximately, $375 thousand in one time capital projects, $6.0 million of MS4 permit compliance capital projects ($1 million annually) and $0.6 million of stormwater retrofit capital projects ($0.1 million annually). To facilitate a ten-year projection period, our analysis assumes that the City will continue to invest in permit compliance and retrofit projects at the same level as the current CIP plan over the remaining modeled years (FY25 - FY28). Given that the City has not yet developed a specific schedule to address the individual WIP projects, the annual $1.1 million serves as the placeholder and approximation for the these projects.

In addition to the projects identified in the capital improvements plan, the City will be required to purchase additional equipment to manage the stormwater system. Based on discussions with City Staff, the City will need an additional street sweeper in the coming years. For planning purposes, our project team assumed the purchase of a new street sweeper in FY 2022 at a cost of $430,000.

Once the capital plan was loaded into the model, the annual funding sources for the capital projects were discussed in detail with City staff during the work session. Stantec demonstrated the impacts of the use of cash "Pay-Go" funding of all of the capital projects, the use of debt to

fund the projects and a combination of debt and cash funding of projects. As a result several capital funding scenarios were developed as part of the study. The total stormwater revenue requirements are discussed in the next section of the report.

2.1.6 Total Stormwater Revenue Requirements

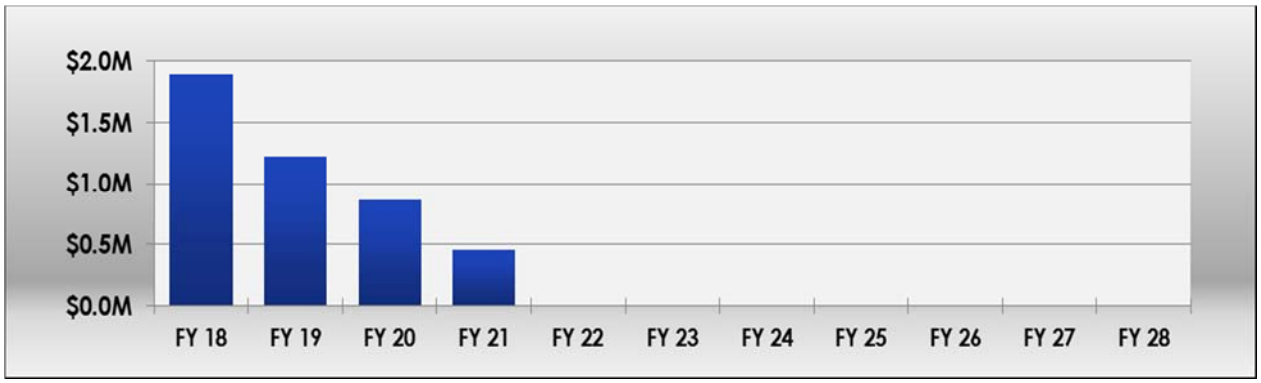
The total stormwater revenue requirements include the operating expenditures, the existing debt service and the funding of capital projects. Table 2-2 presents the stormwater revenue requirements assuming the City cash funds all capital projects identified in the capital improvements plan. The table compares the revenue requirements with the existing revenues.

Table 2-2 Stormwater Revenue Requirements Projection

($ Million)	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28
Budgeted Operating Expenses	0.65	0.67	0.69	0.71	0.73	0.75	0.77	0.80	0.82	0.84
Existing BMP Maintenance	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.10	0.10	0.10
Incremental O&M	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03
Total Operating Expenses	**$0.65**	**$0.67**	**$0.69**	**$0.72**	**$0.85**	**$0.87**	**$0.90**	**$0.92**	**$0.94**	**$0.97**
Cash Funded Capital	1.52	1.17	1.20	1.67	1.28	1.31	1.35	1.39	1.44	1.48
Existing Debt Service	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01
Total Capital Expenses	**$1.55**	**$1.20**	**$1.23**	**$1.70**	**$1.31**	**$1.33**	**$1.37**	**$1.41**	**$1.45**	**$1.49**
Total Stormwater Expenses	**$2.20**	**$1.87**	**$1.93**	**$2.42**	**$2.15**	**$2.20**	**$2.27**	**$2.33**	**$2.39**	**$2.46**
Revenues from Existing Stormwater Fees	**$1.5**	**$1.5**	**$1.5**	**$1.5**	**$1.5**	**$1.5**	**$1.5**	**$1.5**	**$1.5**	**$1.5**
Debt Service Coverage (Min 1.5)	**28.96**	**27.72**	**28.27**	**25.66**	**21.45**	**32.32**	**31.10**	**29.91**	**42.09**	**40.19**

As demonstrated in the Table 2-2, if the City cash funds all capital projects, the current revenues from stormwater fees will be insufficient to meet the annual expenditures of the system. Due to the limited amount of existing debt within the Stormwater Fund, even without stormwater fee adjustments, the City will be able to maintain debt coverage well above the minimum of 1.5. However as shown in Figure 2-1 the Stormwater Fund will exhaust all resources by FY 22 based on the current stormwater revenues and cash funding of the capital improvement projects.

Figure 2-1 Stormwater Fund Balance



It is important to remember that the financial forecast shown above assumes that the City funds all capital projects with cash from current revenues. The use of debt, which is discussed later in this Report would allow the City to maintain cash balances within the Stormwater Fund.

2.1.7 Minimum Reserve Policy

To assist with development of a financial plan for the Stormwater Fund it is necessary to establish a minimum reserve balance to maintain within the Fund. Reserve balances for utility systems are funds set aside for a specific cash flow requirement, financial need, project, task, or legal covenant. These balances are maintained in order to meet short-term cash flow requirements, and at the same time, minimize the risk associated with meeting the financial obligations and continued operational and capital needs under adverse conditions. The level of reserves maintained by a utility is an important component and consideration of developing a utility system multi-year financial management plan.

Many utilities, rating agencies, and the investment community as a whole place a significant emphasis on having sufficient reserves available for potentially adverse conditions. The City does not currently have an established reserve policy for the Stormwater Fund. For purposes of the rate study, we recommend that the City maintain an operating reserve equal to 6 months of operating expenses and a capital reserve equivalent to 20% of the average annual capital spending. This equates a total minimum reserve level in the Stormwater Fund of approximately $0.5 million in FY19. These reserves will ensure that the City maintains adequate funds with the stormwater system to meet the needs of the system.

2.2 FINANCIAL PLAN DEVELOPMENT

As demonstrated in the revenue sufficiency analysis, the City's current stormwater fees are not sufficient to meet the funding requirements of the system and the Stormwater Fund will exhaust its resources by FY 22. There are several ways in which the City can address the needs of the system. As mentioned in the previous section, the revenue requirements were developed

assuming that City funds all capital projects with current revenues, using the "Pay-Go" approach. The use of debt to fund all or a portion of the capital projects would change the financial forecast. Additionally, the City could increase the stormwater fee to provide additional funding for the system. To examine the various options available to the City, our project team developed a number of financial management plans for the Stormwater Fund. The specific financial planning scenarios include the following:

- Scenario I – Cash fund all capital projects and adjust stormwater fees to ensure minimum reserve balances.
- Scenario II – Debt fund all capital projects and adjust stormwater fees to ensure debt service coverage requirements are met.
- Scenario III – Allow the financial model to optimize the use of cash and debt funding and adjust rates to meet reserves and debt coverage requirements.

The results for each of the financial planning scenarios are outlined below over a five year projection period. It should be noted that for each scenario, it was assumed that no fee adjustments will be implemented in FY 19. This was assumed given the need for the City to determine the actual required spending to comply with the new permit and to provide time to address the stormwater fee structure (discussed in the next section of this report).

Financial Planning Scenario I - All Cash Funding of Capital Plan

The cash funding of all capital projects will require the City to increase stormwater fees over the next few years. The cash balance within the Stormwater Fund currently exceeds the minimum reserve balance described in Section 2.1.7. Therefore the City would be able to spend down some of the balance over the coming years and minimize the stormwater fee adjustments. Table 2-3 presents the necessary stormwater fee increases required to maintain the minimum reserve balance over the projection period, the results quarterly residential stormwater bill and the annual debt service coverage.

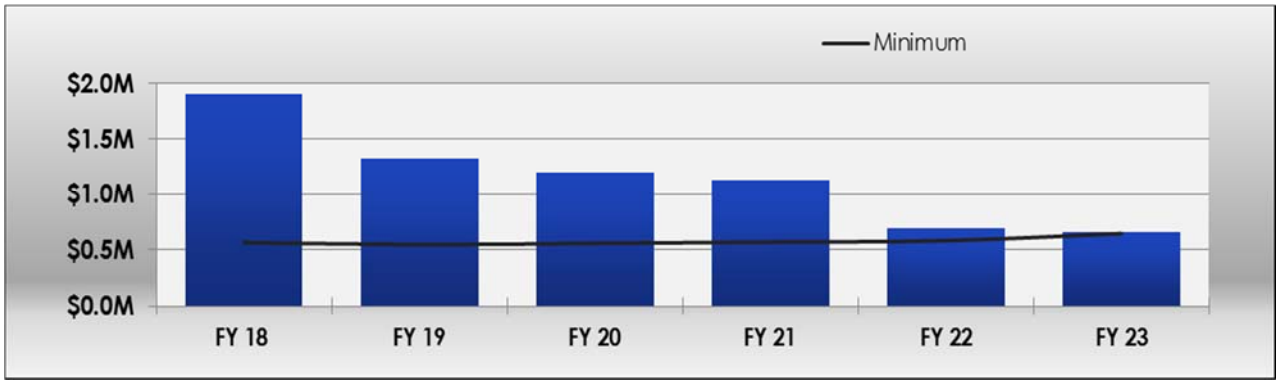
Table 2-3 Scenario I - Stormwater Fee Adjustments and Debt Coverage

	FY 19	FY 20	FY 21	FY 22	FY 23
Effective Date	7/1/2018	7/1/2019	7/1/2020	7/1/2021	7/1/2022
Stormwater Fee Increase[(1)]	**0%**	**11.0%**	**11.0%**	**11.0%**	**5.0%**
Quarterly Residential Stormwater Bill	**$15.00**	**$16.65**	**$18.48**	**$20.51**	**$21.54**
Debt Service Coverage (Min 1.5)	**28.96**	**27.72**	**46.64**	**43.53**	**43.63**

[(1)] Plan requires additional increases in future years (following FY 23) of at least 2.5% to maintain reserve balances

Figure 3 presents the estimated annual cash balance within the Stormwater Fund based on the stormwater fee adjustments shown in Table 2-3. The "Minimum" line reflects the stormwater fund balance minimum to maintain operating and capital reserves recommended in Section 2.1.7 of this Report.

Figure 3 End of Year Stormwater Cash Balance - Scenario I



Financial Planning Scenario II – All Debt Funding of Capital Plan

The debt funding of all capital projects would allow the City to fund the stormwater system with minimal adjustments to stormwater fees. However, as the City issues more debt the ability of the stormwater revenues to meet the annual debt service coverage requirements becomes the limiting factor for the Fund, as compared to the maintenance of the minimum reserves. Table 2-4 presents the necessary stormwater fee adjustments assuming the full debt funding of the capital projects.

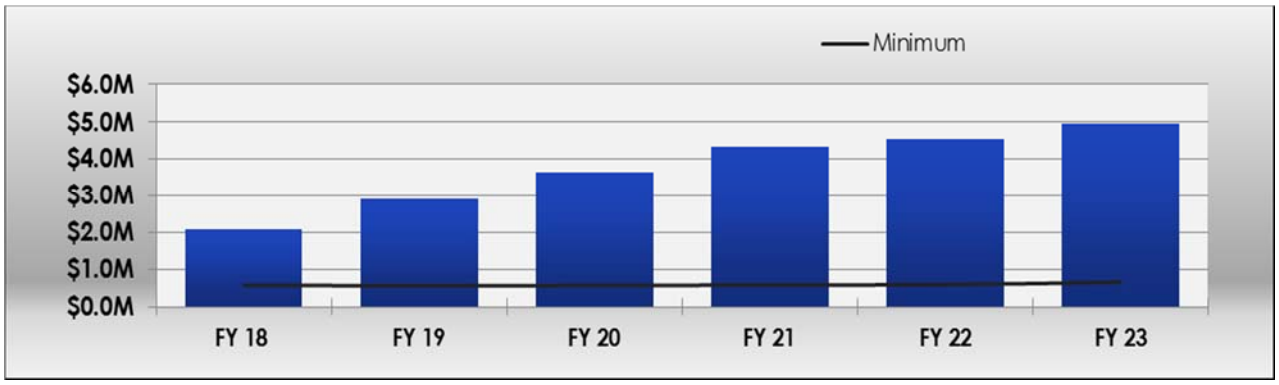
Table 2-4 Scenario II - Stormwater Fee Adjustments and Debt Coverage

	FY 19	FY 20	FY 21	FY 22	FY 23
Effective Date	**7/1/2018**	**7/1/2019**	**7/1/2020**	**7/1/2021**	**7/1/2022**
Stormwater Fee Increase[(1)]	**0%**	**5.0%**	**5.0%**	**5.0%**	**5.0%**
Quarterly Residential Stormwater Bill	**$15.00**	**$15.75**	**$16.54**	**$17.37**	**$18.24**
Debt Service Coverage (Min 1.5)	**7.12**	**4.04**	**3.07**	**2.48**	**1.94**

[(1)] Plan requires additional increases in future years (following FY 23) of at least 5% to maintain coverage.

Table 2-4 demonstrates the reduction in debt service coverage under this scenario due to the ongoing debt issuances that would be required to fund the capital plan. The debt coverage is the key factor driving the need for fee increases. Under this scenario the City would build up a significant fund balance within the Stormwater Fund, as demonstrated in Figure 4.

Figure 4 End of Year Stormwater Cash Balance - Scenario II



Given the significant buildup of cash, a scenario where the City funds all capital projects with debt would not be an appropriate approach for the Stormwater Fund. A combination of cash funding and debt would be more appropriate as outlined in Scenario III.

Financial Planning Scenario III – Use of Cash and Debt to Fund Capital Plan

The final scenario considered during the study included the use of both cash and debt to develop an optimized financial plan. Under this plan the City would spend down existing stormwater cash balances to the minimum reserve target, while gradually increasing stormwater fees and utilizing debt funding to minimize the necessary increases. Table 2-5 presents the stormwater fee increases, the resulting quarterly stormwater bills for residential customers and the debt coverage.

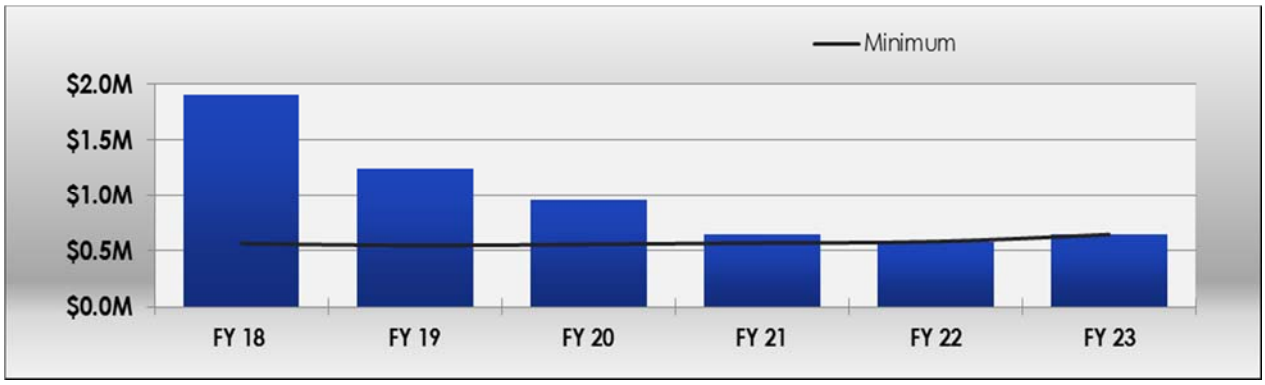
Table 2-5 Scenario III - Stormwater Fee Adjustments and Debt Coverage

	FY 19	FY 20	FY 21	FY 22	FY 23
Effective Date	**7/1/2018**	**7/1/2019**	**7/1/2020**	**7/1/2021**	**7/1/2022**
Stormwater Fee Increase[(1)]	**0%**	**2.0%**	**2.0%**	**2.0%**	**2.0%**
Quarterly Residential Stormwater Bill	**$15.00**	**$15.30**	**$15.61**	**$15.92**	**$16.24**
Debt Service Coverage (1.5 Min)	**28.96**	**28.71**	**29.33**	**11.27**	**5.43**

[(1)] Plan requires additional increases in future years (following FY 23) of at least 2% to maintain minimum reserve balances.

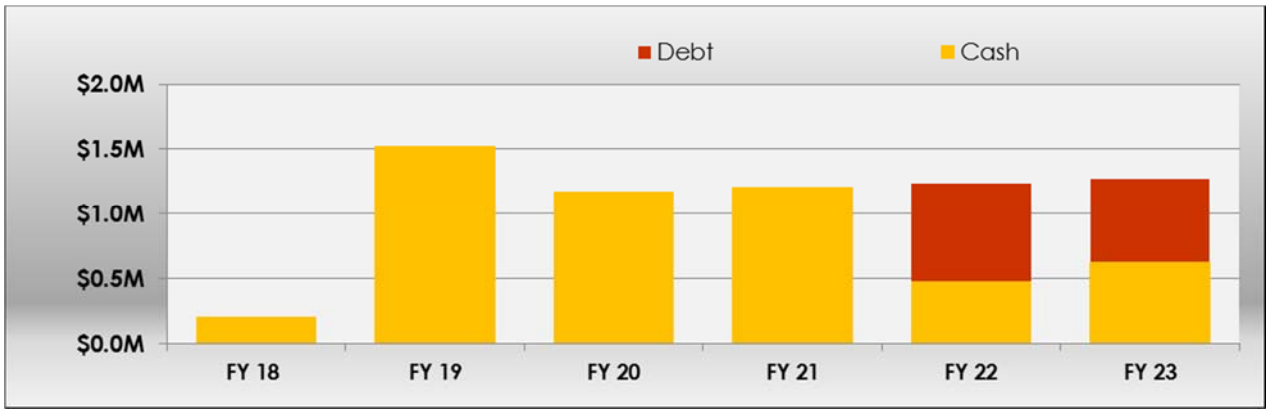
Under this scenario the City would spend down the cash balance above the minimum reserve balance within the Stormwater Fund and then maintain the minimum fund balance within the Stormwater Fund, as demonstrated in Figure 5.

Figure 5 End of Year Stormwater Cash Scenario III



The split between cash and debt funding of the annual stormwater projects is shown in Figure 6. In years past FY 23, the City would need to continue to fund a portion of capital projects with debt to maintain the annual 2% increase in stormwater fees.

Figure 6 Annual Capital Project Funding



Based on our analysis of the financial position of the Stormwater Fund and the future needs of the system, we recommend that the City consider the use of a combination of cash and debt funding to fund the capital improvement projects. The exact mix of cash and debt and the subsequent adjustments to the stormwater fees can be further refined as the City finalizes its plan to address the requirements of the new MS4 permit.

3. STORMWATER FEE STRUCTURE ANALYSIS

The next component of the Study was the evaluation of the stormwater fee structure that the City uses to recover revenue from all properties within the City. This included a review of the current approach used by the City and evaluation of alternative approaches that may enhance customer equity, and conformance with industry best practices while aligning with the cost of service and revenue requirement results presented in the previous sections of this report.

3.1 BASIS FOR STORMWATER RATES

A stormwater rate or user fee is intended to reflect the proportional cost of providing services to specific users of the stormwater system, similar to other core services provided by the City, such as water and sewer. Stormwater services provided to customers consist primarily of managing the runoff generated by properties within the City during rain events. Similar to other utility services, the more the service is used the greater the cost of providing the service. In a stormwater system, this relates to the quantity of runoff generated by a property (i.e. more runoff generated by an account has a greater impact on the stormwater system and results in a greater cost of service).

Unlike water service which has a meter to measure water use, stormwater generation is not directly measurable. To assess or quantify the impact on the system, stormwater rates are typically assessed based on real parcel attributes. Real impervious area characteristics of individual accounts have been widely accepted as the best measurement of stormwater runoff and hence the use of a stormwater system. The City currently uses account-specific impervious area as the basis for runoff related stormwater charges for each of its individual non-residential customers. Residential customers are currently assessed a fixed quarterly charge, regardless of impervious area associated with their respective property.

3.2 CURRENT RATE STRUCTURE

The City's current stormwater rate structure includes a fixed fee for all residential customers charged on a per dwelling unit basis and tiered fees for non-residential customers based on the measured total square footage of impervious area of the customer's parcel. The table to the right includes the current fee structure and fees.

Residential SW Charge	$15.00
Non Residenital SW Charges	
0-5,000 SQ.FT Imp Area	$60.00
5,001-10,000 SQ.FT Imp Area	$120.00
>10,000 SQ.FT Imp Area	$195.00

3.3 STORMWATER RATE STRUCTURE EVALUATION

While the current stormwater fee structure used by the City of Annapolis has allowed the City to generate dedicated revenues for the management of the stormwater system, it does pose some general equity concerns. The City's current approach to charging stormwater fees for residential parcels treats all properties the same regardless of impervious area or type of residential property. For example, an apartment unit is currently charged the same stormwater fee as a single family residential parcel. While it is common to assess a standard fixed fee for all single-family residential properties, given the relatively homogenous nature of the impervious area for these parcels, it is not typical to assess this same fee to individual multi-family units.

The current structure also presents equity concerns related to the stormwater fee structure for non-residential properties. Under the current structure, non-residential stormwater fees are essentially capped based on the existing tiers. For example, under the current fee structure a non-residential parcel with 200,000 square feet of impervious area pays the same stormwater fee as a parcel with 11,000 square feet, since the fee is the same for all parcels with impervious area greater than 10,000 square feet.

Based on our experience, there are alternative stormwater fee structures that have been implemented by communities around the United States and in Maryland that address these equity concerns and more closely align the use of the stormwater system by individual property owners and their stormwater fee.

3.3.1 Alternative Fee Structure Development

To address the equity concerns mentioned above, our project team considered several alternative fee structures for the City. While it was important to consider alternatives that would more closely align the use of the system and the fee, the required administrative effort, data requirements and the ability of the City to implement that structure were important considerations. Based on this review, an alternative stormwater fee structure was developed that strikes a balance between equity and the requirements to manage and implement the structure.

The alternative stormwater fee structure would place stormwater accounts into two groups; single family residential and non-single family residential. Similar to the City's current structure, single family residential parcels would all be charged the same stormwater fee. The fee would be based on the average measured impervious area on these parcels and would be defined as the Equivalent Residential Unit (ERU). All non-single family residential properties would be charged a stormwater fee based on the actual measured impervious surface as measured of multiples of ERUs. For example if an ERU is defined as 1,600 square feet of impervious area, an apartment complex with

16,000 square feet of impervious would be billed for 10 ERUs. The development of this alternative structure is presented in the following sections.

3.3.2 ERU Calculation

To develop the alternative stormwater fee structure, it was necessary to complete an impervious area analysis for all parcels within the City. This analysis was used to determine the median impervious area on all single family residential parcels to define the ERU basis for the fee. To complete the impervious area analysis, the City provided Stantec with GIS data that allowed our team to evaluate the City-wide imperviousness and create a Master Impervious Layer. Shapefiles providing the size and location of sidewalks, driveways, parking lots, swimming pools, and buildings served as the basis for all imperviousness (Figure 7). These shapefiles were merged to create one large impervious layer, and then intersected with the parcel boundaries to provide a new Master Impervious Layer containing the total imperviousness per parcel (Figure 8). It should be noted that the impervious area layer contained within the City's GIS database was developed a number of years ago. As a result, it is unclear how accurately the database represents the current imperious area within the City. The City is currently in the process of obtaining a new impervious area layer, which will be finalized by September of 2018. Once this data is available, it would be appropriate for the City to update the impervious area analysis included in this analysis to ensure that impervious area is accurately represented.

Figure 7. City-Wide Impervious Area

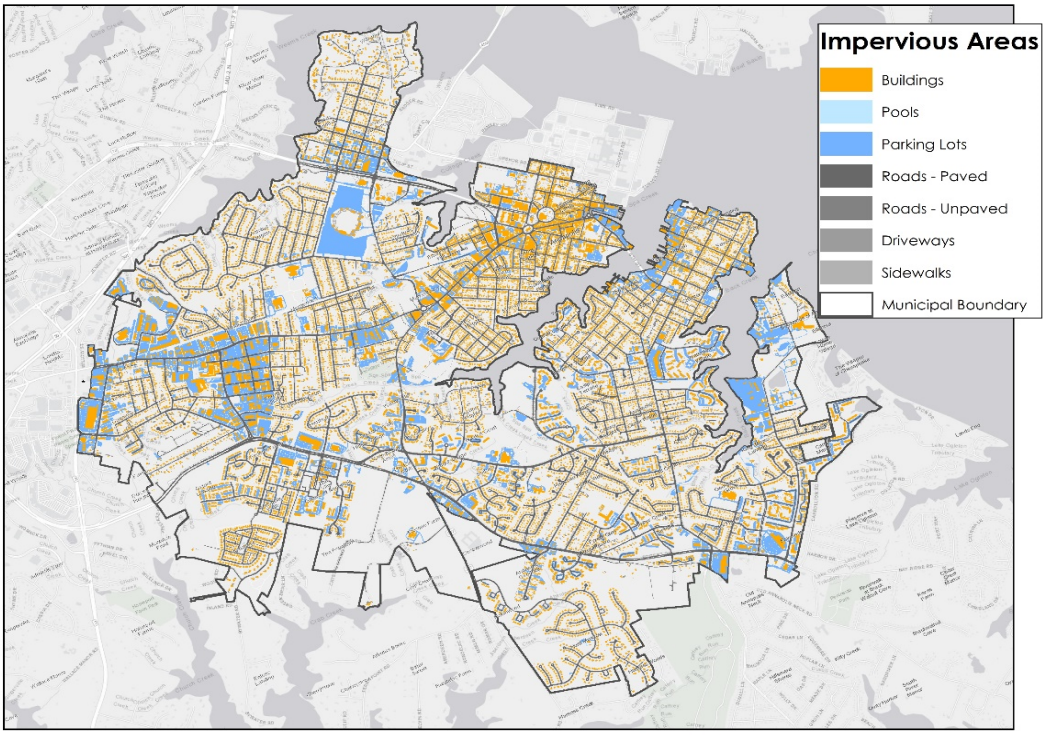
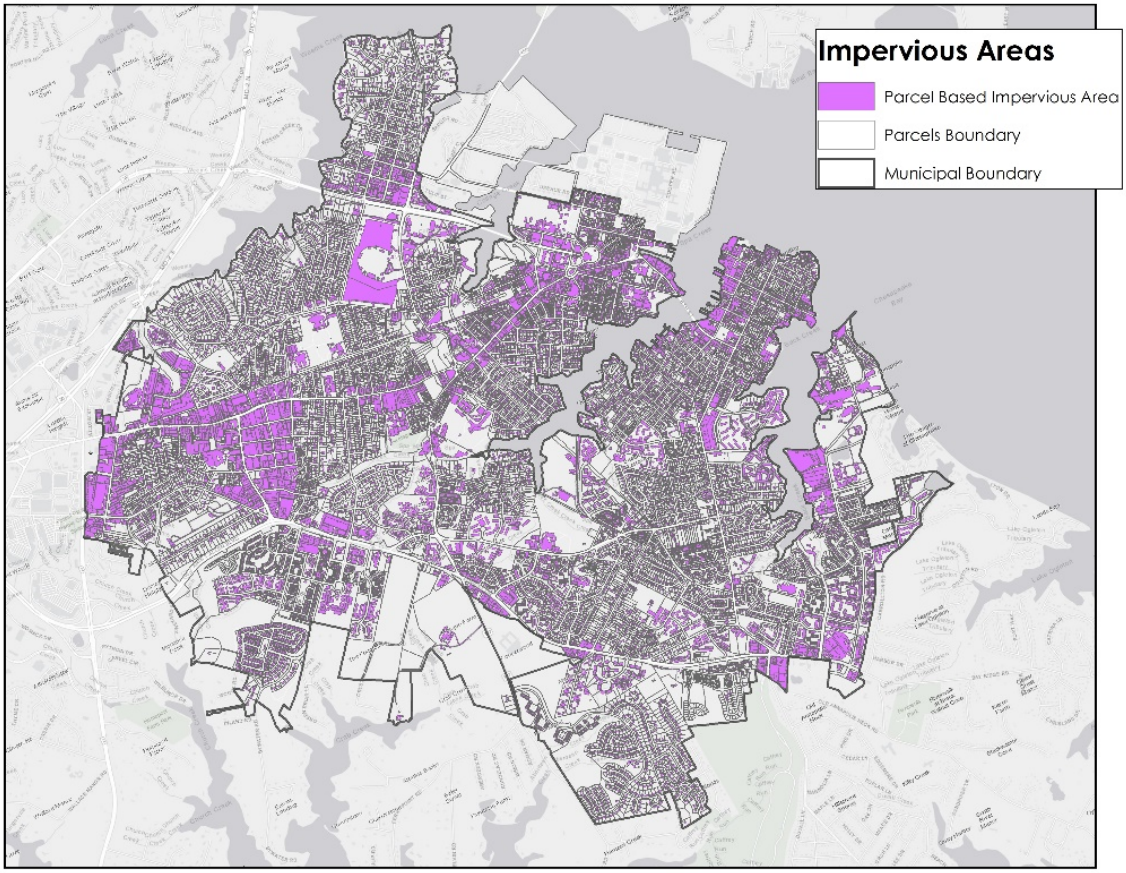


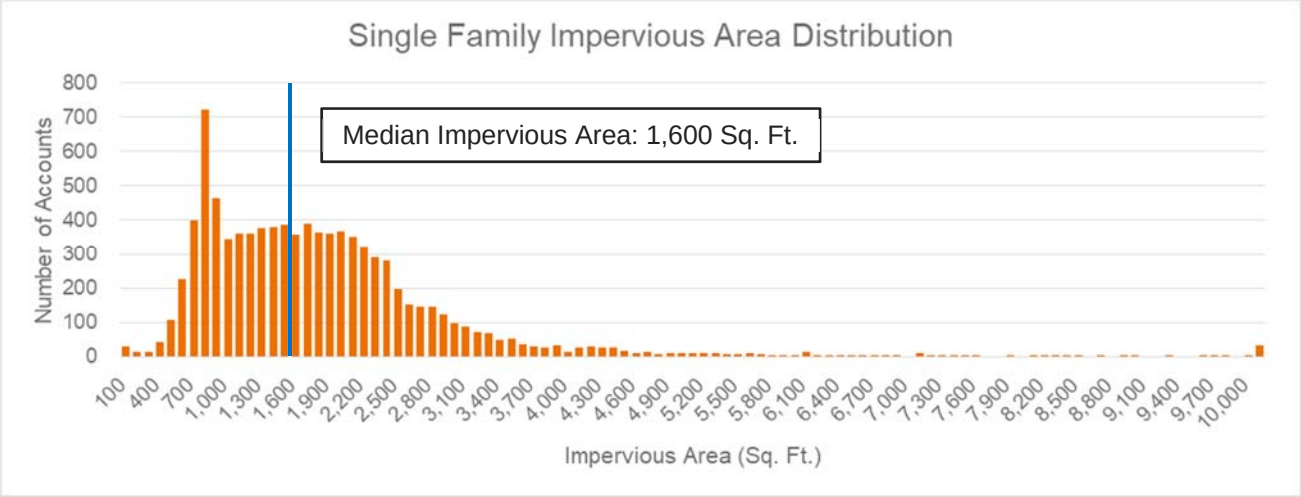
Figure 8. Master Impervious Layer – Total Imperviousness per Parcel



The Master Impervious Layer data was then exported into excel where the impervious data was joined to the City Billing Data using Parcel Codes to allow imperviousness to be assigned to each existing account. In the case of condominiums and apartments, the impervious area was split among each dwelling unit.

The ERU basis was then determined by calculating the median value of all of the Single Family residential accounts. Figure 9 shows a histogram of the distribution of the amount of impervious area on 9,929 single family properties identified in the City. The distribution shows that the majority of single family properties in the County have between 700 and 2,500 square feet of impervious. The statistical median impervious area is approximately 1,600 square feet.

Figure 9. Single Family Residential Impervious Area Distribution



As mentioned above, the median impervious area is used to determine the base unit for assessing the stormwater fee, termed the ERU. The determination of the ERU allows for the determination of the number of billable units under the alternative fee structure. Table 3-1 presents the current number of billable units based on the City's current stormwater fee structure and the number of billable units (ERUs) under the alternative structure.

Table 3-1 Current and Alternative Structure Number of Billable Units

Property Classification	Current Billable Units	Alternative Structure ERUs
Residential	17,459	11,485
Non-Residential	6,770	14,014
Total	**24,229**	**25,127**

As demonstrated in the table, the number of billable units under the current stormwater fee structure are higher for residential properties as compared to the alternative fee structure. This reduction in units is a result of the fact that under the alternative structure each apartment unit is not billed as a single unit, to address the equity issues mentioned earlier in this report. However, the alternative structure results in a higher number of billable units for non-residential properties due to the removal of the cap on the impervious area (i.e. property owners are billed based on actual imperious area as compared to the current tiers). Due to these offsetting shifts in the number of billable units, the totals under the current and alternative structure are fairly similar and therefore a change in the structure would have minimal impact on total revenues (i.e. a $1 stormwater fee would generate $24,229 under the current approach and $25,127 under the alternative structure).

3.3.3 Stormwater Fee Determination

Once the number of billable units are determined, it is possible to determine the stormwater fee based on the financial plan discussed in Section 2 of this report. The fee per ERU is calculated by taking the quotient of the revenue requirements, calculated in the financial plan and the sum of all ERUs. The amount charged to each account is the product of the ERU charge and the number of ERUs for that account. Table 3-2 presents the calculated stormwater fee (assuming a mix of cash and bonds to fund capital projects as defined by Scenario III as defined in Section 2). The table assumes the implementation of the new rate structure in FY20.

Table 3-2 Stormwater Fees under Alternative Fee Structure

	FY 19	FY 20	FY 21	FY 22	FY 23
Effective Date	**7/1/2018**	**7/1/2019**	**7/1/2020**	**7/1/2021**	**7/1/2022**
Stormwater Fee Increase[(1)]	**0%**	**2.0%**	**2.0%**	**2.0%**	**2.0%**
Quarterly Single Family Residential Stormwater Bill	**$15.00**	**$15.22**	**$15.53**	**$15.84**	**$16.15**
Debt Service Coverage (1.5 Min)	**28.96**	**28.71**	**29.33**	**11.27**	**5.43**

[(1)] Plan requires additional increases in future years (following FY 23) of at least 2% to maintain minimum reserve balances.

Due to the limited change in the total number of billable units under the alternative stormwater fee structure the quarterly stormwater bills are very similar to those presented in Table 2-5.

3.3.4 Property Owner Impacts

While the total number of billable units and the stormwater bill for the single family residential property do not differ significantly between the current and alternative fee structure, the impacts of non-single family properties will differ significantly under each structure. Table 3-3 presents a summary of the average stormwater bill by property type under the current and alternative structure. The property types shown in the table are based those identified in the City's stormwater billing system. It should be noted that the table demonstrates the change in the quarterly bill for the entire property. This is important to note for properties such as apartments as the bill is for the entire complex, as compared to the charge for the individual unit.

Table 3-3 Stormwater Fees under Alternative Fee Structure

Property Type	Total Properties	Average Quarterly Bill - Current Structure	Average Quarterly Bill - Alternative Structure	Quarterly Change
Apartment	506	$150	$58	($92)
Church	32	$147	$192	$45
Condominium	89	$270	$261	($10)
Gas Station	16	$197	$182	($14)
Govt - County	6	$202	$526	$324
Govt-State / Fed / Other	21	$168	$521	$354
Group Home	19	$15	$11	($5)
Hotels & Motels	8	$147	$327	$180
Housing Authority	79	$205	$99	($105)
Mixed Use	14	$75	$33	($43)
Offices	176	$116	$133	$17
Restaurant	62	$105	$102	($3)
Retail	204	$117	$148	$31
School - Not Public	6	$163	$487	$324
Schools - County	9	$202	$1,186	$984
Single Family Residential	9,926	$15	$15	-

Table 3-3 demonstrates the range of quarterly bill impacts as a result of the alternative structure. It should be noted that the table demonstrates the average quarterly bill, so there would be additional variations, depending on the characteristics of the individual property. However, given the magnitude of some of the bill increases for some individual properties, it would be advisable for the City to proactively reach out to these properties in advance of a change to the new fee structure, should the City implement the new structure.

4. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations were developed during the completion of the Stormwater Utility Rate Study.

4.1 FINANCIAL PLAN

Based on our review of the City's current and project stormwater system revenue requirements and the corresponding stormwater fee revenues, we have developed several conclusions.

- The current and projected revenue requirements for the management of the City's stormwater system will outpace the system revenues over the coming years. The primary driver for increases in the system revenue requirements are the capital projects associated with compliance with the City's new MS4 permit.
- To address the needs of the stormwater system, the City will need to adjust the stormwater fee over the next several years. The magnitude of the increases that are required will depend on how aggressively the City moves forward with the completion of capital projects and the ultimate cost of compliance with the City's new MS4 permit.
- The City currently has adequate cash balances within the Stormwater Fund to cash fund a portion of the capital project identified for the stormwater system. The use of a combination of cash "pay-go" funding and debt issuance will minimize the necessary adjustments to the stormwater fee. Table 4-1 presents an initial financial plan for the Stormwater Fund based on the currently planned capital projects (spending of $1.1 million per year on capital projects). The plan will require adjustments should the City be required to more aggressively execute capital projects over the next several years.

Table 4-1 - Stormwater Financial Plan

	FY 19	FY 20	FY 21	FY 22	FY 23
Effective Date	**7/1/2018**	**7/1/2019**	**7/1/2020**	**7/1/2021**	**7/1/2022**
Stormwater Fee Increase[(1)]	**0%**	**2.0%**	**2.0%**	**2.0%**	**2.0%**

[(1)] Plan requires additional increases in future years (following FY 23) of at least 2% to maintain minimum reserve balances.

- We recommend that the City continue to evaluate a financial plan for the stormwater system over the coming year as the plans for addressing the requirements of the MS4 permit take shape.

4.2 STORMWATER FEE STRUCTURE

Based on our review the City's current stormwater fee structure, we have developed several conclusion and recommendations.

- The City's current stormwater fee structure presents some equity concerns for residential customer accounts. The current approach of assessing the same stormwater fee for customer located on single family parcels and those in multi-family units (such as apartments) is problematic.
- The City's current stormwater fee structure consisting of tiers for non-residential property owners also presents some equity concerns. The current tiers essentially cap the stormwater fees and therefore does not provide a structure that aligns potential contributions and use of the stormwater system with the stormwater fee (i.e. a property owner with 11,000 square feet of impervious area pays the same as a property owner with 100,000 square feet).
- To address these equity concerns, we recommend that the City adopt an alternative stormwater fee structure that consists of a uniform stormwater fee for all single family residential properties set at one equivalent residential unit (ERU) consisting of 1,600 square feet of impervious area. All non-single family residential properties should be billed based on the actual impervious area on the property as multiples of ERU's. The stormwater fees under the alternative structure and based on the financial plan presented above are shown in Table 4-2.

Table 4-2 Stormwater Fees

	FY 19	FY 20	FY 21	FY 22	FY 23
Effective Date	**7/1/2018**	**7/1/2019**	**7/1/2020**	**7/1/2021**	**7/1/2022**
Stormwater Fee Increase(1)	**0%**	**2.0%**	**2.0%**	**2.0%**	**2.0%**
Quarterly Single Family Residential Stormwater Bill	**$15.00**	**$15.22**	**$15.53**	**$15.84**	**$16.15**

- While the recommended stormwater fee structure will have a minimal impact on single family residential properties, the structure will result in more significant changes to some non-residential properties, specifically those with significant amounts of impervious area. The City should consider engaging those property owners that would experience the most significant increases due to the change in structure to inform them of the change and the reason why their stormwater bill is increasing.
- The stormwater fee development completed as part of this study was based on the City's existing impervious area information located in the City's GIS database. The data was

established several years ago. The City anticipates obtaining new impervious area data this September. We recommend that once the data is available, the City completes an updated analysis of the impervious area on each property on in the City to establish an up-to-date stormwater utility billing database. The results of this analysis may result in variations in the median impervious area on single family parcels and the definition of an ERU.

Disclaimer

This document was produced by Stantec Consulting Services, Inc. ("Stantec") for the City of Annapolis, MD and is based on a specific scope agreed upon by both parties. In preparing this report, Stantec utilized information and data obtained from the City of Annapolis or public and/or industry sources. Stantec has relied on the information and data without independent verification, except only to the extent such verification is expressly described in this document. Any projections of future conditions presented in the document are not intended as predictions, as there may be differences between forecasted and actual results, and those differences may be material.

Additionally, the purpose of this document is to summarize Stantec's analysis and findings related to this project, and it is not intended to address all aspects that may surround the subject area. Therefore, this document may have limitations, assumptions, or reliance on data that are not readily apparent on the face of it. Moreover, the reader should understand that Stantec was called on to provide judgments on a variety of critical factors which are incapable of precise measurement. As such, the use of this document and its findings by the City of Annapolis should only occur after consultation with Stantec, and any use of this document and findings by any other person is done so entirely at their own risk.