STORMWATER MANAGEMENT

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Stormwater Management
Proposed FY 2016 - 2025 Capital Improvement Program
Summary of Projects

Note: Projects with $0 total funding are active capital projects funded in prior CIPs that do not require additional resources.

CIP Seciton/Subsection/Project	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	TOTAL FY 16-25
Stormwater Management											
Ft. Ward Stormwater	0	0	0	0	0	0	0	0	0	0	0
NPDES / MS4 Permit	0	0	0	0	0	0	0	0	0	0	0
Four Mile Run Channel Maintenance	0	0	600,000	0	0	0	0	600,000	0	0	1,200,000
Storm Sewer Capacity Assessment	0	0	0	0	475,000	475,000	0	0	0	0	950,000
Green Infrastructure in CSO Areas	500,000	0	0	0	0	0	0	0	0	0	500,000
Stream & Channel Maintenance	0	1,250,000	850,000	1,200,000	450,000	450,000	450,000	450,000	450,000	450,000	6,000,000
Stormwater Utility Study	640,000	0	0	0	0	0	0	0	0	0	640,000
MS4-TMDL Compliance Water Quality Imprv.	0	400,000	500,000	500,000	3,000,000	3,000,000	3,500,000	3,500,000	7,000,000	7,000,000	28,400,000
Storm Sewer System Spot Improvements	0	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	2,700,000
Lake Cook Stormwater Management	0	0	0	0	0	0	0	0	0	0	0
Cameron Station Pond Retrofit	2,250,000	625,000	625,000	0	0	0	0	0	0	0	3,500,000
City Facilities Stormwater Best Management Practices (BMPs)	0	412,000	1,133,000	0	0	0	0	0	0	0	1,545,000
FY 2016 - 2025 Stormwater Management Total	3,390,000	2,987,000	4,008,000	2,000,000	4,225,000	4,225,000	4,250,000	4,850,000	7,750,000	7,750,000	45,435,000

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Ft. Ward Stormwater

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): Recreation, Parks & Cultural Activities, Historic Alexandria
ORG: 52412157

Project Location: 4301 West Braddock Rd.
Reporting Area: Seminary Hill/Strawberry Hill
Project Category: 3 – New Facilities
Estimated Useful Life: 25 years

Ft. Ward Stormwater													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	585,000	*585,000*	0	0	0	0	0	0	0	0	0	0	0
Financing Plan													
Prior City & Stormwater Funding	585,000	*585,000*	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	585,000	*585,000*	0	0	0	0	0	0	0	0	0	0	0
Additional Operating Impact													
Annual Impact			0	0	0	0	0	0	0	0	0	0	0
Cumulative Impact			0	0	0	0	0	0	0	0	0	0	0

Changes from Prior Year CIP: No changes from prior year CIP. This is an active project with no additional funding required.

Project Description & Justification

Fort Ward Park is the best preserved of the system of Union forts and batteries built to protect Washington, DC during the American Civil War (1861-1865). This site receives drainage from the adjacent Marlboro Estates subdivision built in the late 1970's, Episcopal High School property, and from the adjacent Braddock Road area. Over time, due to changes in grading and overland drainage patterns, erosion has occurred in the park and in the adjacent Oakland Baptist Church cemetery. Additionally, the stream in the park is showing signs of erosion and degradation. Property owners at the bottom of the park are experiencing flooding. In calendar year 2011, an interim drainage system was installed to protect the Oakland Baptist Church Cemetery from further soil erosion and flooding due to stormwater runoff.

The scope of work includes studying the existing drainage infrastructure in Fort Ward Park and making recommendations for improvements as well as the construction of those recommended improvements. This project will be informed by, and will be required to coordinate, planning and construction activities with ongoing OHA archaeological investigations and discoveries.

A drainage master plan was completed in July 2014 and included recommendations to divert drainage away from the cemetery, install BMPs to threat the stormwater from the roadway drainage, and restore the stream that runs through the park. Sufficient funding is provided to complete the first two recommendations. The master plan will be the basis for design of the improvement which is expected to begin in FY 2016. The drainage master plan is included in the adopted Ft. Ward Park and Museum Area Management Plan.

Environmental benefits achieved by the completion of recommended improvements include overland flow improvements, erosion protection, and improved water quality, all of which will improve the natural quality of the land in the project area.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City
- Improve the health of City waterways
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government
- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- 2015 Fort Ward Park and Museum Area Management Plan
- Budget Memorandum #46, April 8, 2011 (FY 2012)

Additional Operating Budget Impact

An additional impact to the operating budget is not anticipated.

NPDES / Municipal Separate Storm Sewer System (MS4) Permit Program

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): N/A
ORG: 52411860

Project Location: Citywide
Reporting Area: Citywide
Project Category: 3 – New Facilities
Estimated Useful Life: Varies

NPDES / MS4 Permit													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	350,000	*350,000*	0	0	0	0	0	0	0	0	0	0	0
Financing Plan													
Prior City & Stormwater Funding	350,000	*350,000*	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	350,000	*350,000*	0	0	0	0	0	0	0	0	0	0	0
Additonal Operating Impact													
Annual Impact			0	0	0	0	0	0	0	0	0	0	0
Cumulative Impact			0	0	0	0	0	0	0	0	0	0	0

Changes from Prior Year CIP: No changes from prior year CIP. This is an active project with no additional funding required.

Project Description & Justification

This project provides for the data collection, reporting activities, public education, outreach, involvement and citizen participation associated with implementation of the programs required by the National Pollution Discharge Elimination System (NPDES) permit regulations that are administered currently by the Virginia Department of Conservation and Recreation (DCR) through the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Storm Water from Municipal Separate Storm Sewer Systems (MS4) per 4VAC50-60 et. seq.

The permit requires the City to develop, implement and enforce our MS4 Program Plan to reduce discharges of pollutants from the MS4, protect water quality, and satisfy the appropriate requirements of the Clean Water Act.

The City was originally issued General Permit VAR040057 on July 8, 2003, and the most recent permit was issued on July 1, 2013. The currently Approved five-year permit is scheduled to be effective through June 30, 2018. Each successive permit has contained more regulatory requirements which necessitate more resources. The new permit is no exception.

The new permit regulations require more public education and outreach, increased staff training, creation of new Total Maximum Daily Load (TMDL) plans and SOPs for daily operations, enhanced inspections, greater data collection, and additional reporting. The new permit also contains stringent requirements to meet the recent Chesapeake Bay TMDL for nutrients and sediment, as well as other TMDLs that have been developed for local surface waters.

This project maintains the City's compliance with regulatory permits, while developing and enhancing the MS4 program. Planned capital projects required by the permit /C-Bay TMDLs are budgeted separately as separate specific projects under "Stormwater Management" section of the CIP.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
- Sustain the natural quality of land within the City
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- Consistent with the Eco-City Charter and Eco-City Action Plan 2030, adopted by City Council June 2008 and June 2009 respectively

Additional Operating Budget Impact

An additional impact to the operating budget is not anticipated.

Four Mile Run Channel Maintenance

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): N/A
ORG: 43411623

Project Location: Four Mile Run Stream/Channel
Reporting Area: Potomac West
Project Category: 2 – Renovations/Existing Assets
Estimated Useful Life: 10 years

Four Mile Run Channel Maintainence													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	3,293,000	*2,093,000*	0	0	600,000	0	0	0	0	600,000	0	0	1,200,000
Financing Plan													
Prior Year City Funding	2,093,000	*2,093,000*	0	0	0	0	0	0	0	0	0	0	0
Cash Capital	1,200,000	*0*	0	0	600,000	0	0	0	0	600,000	0	0	1,200,000
Total Financing Plan	3,293,000	*2,093,000*	0	0	600,000	0	0	0	0	600,000	0	0	1,200,000
Additonal Operating Impact													
Annual Impact			0	0	0	0	0	0	0	0	0	0	0
Cumulative Impact			0	0	0	0	0	0	0	0	0	0	0

Changes from Prior Year CIP: No changes from prior year CIP.

Project Description & Justification

This project reflects the City's share of the costs to maintain the federally funded stormwater flood control channel and system of flood walls and levees. The project was constructed as a federal flood control project built by the U.S Army Corps of Engineers (USACE) in the late 1970's which by mutual agreement requires the City to provide regular upgrades to its capital infrastructure. The U.S. Army Corps of Engineers annually inspects Four Mile Run and dictates the extent of the channel maintenance activities that are to be completed. The City has hired a consultant to perform a detailed inspection of the flood control system, and to develop recommendations for corrections. Staff is working with the Corps to determine exactly what improvements the City needs to do to bring the rating up to the upgraded post-Hurricane Katrina standards that the USACE now considers acceptable.

To date, $2.093 million in City funding has been applied to the project. Funding is programmed in the out-years of the CIP to address future capital infrastructure requirements.

As Four Mile Run maintenance is a shared responsibility with Arlington County, it will be necessary for the County and the City to engage in a joint decision-making process concerning some elements of Four Mile Run maintenance activities. Levee/flood wall maintenance remains the responsibility of the jurisdiction where the levee/wall is located.

The regular maintenance to the flood control system ensures that the flood control project will perform as predicted and protects citizens and property from flooding.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
- Sustain the natural quality of land within the City
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

Focus Area: Safe, Secure, & Just Community

- Reduce harm to people or property from disasters

External or Internal Adopted Plan or Recommendation

- N/A

Additional Operating Budget Impact

An additional impact to the operating budget is not anticipated.

Storm Sewer Capacity Assessment

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): N/A
ORG: 52411851

Project Location: Citywide
Reporting Area: Citywide
Project Category: 1 – Asset Maintenance
Estimated Useful Life: N/A

Storm Sewer Capacity Assessment													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	950,000	*0*	0	0	0	0	475,000	475,000	0	0	0	0	950,000
Financing Plan													
Prior City & Stormwater Funding	4,238,500	*0*	0	0	0	0	0	0	0	0	0	0	0
Cash Capital	950,000	*0*	0	0	0	0	475,000	475,000	0	0	0	0	950,000
Total Financing Plan	5,188,500	*0*	0	0	0	0	475,000	475,000	0	0	0	0	950,000
Additional Operating Impact													
Annual Impact			0		0	0	0	0	0	0	0	0	0
Cumulative Impact			0	0	0	0	0	0	0	0	0	0	0

Changes from Prior Year CIP: No changes from prior year CIP.

Project Description & Justification

This project provides for a multi-year citywide storm sewer analysis and flow modeling to determine the stormwater system's capacity and to develop recommendations for improvements to the existing storm sewer system.

The project includes flow modeling, field verification of invert elevations and manhole locations, and condition assessments of pipes 24 inch diameter or greater. This study is budgeted as a response to several large magnitude storms in 2003 and 2006 that caused flooding in low-lying areas of the City.

The analysis and assessment will look at reducing flooding in problem areas by employing a variety of technologies including "Green Infrastructure" such as: rain gardens, infiltration swales, planter boxes, tree canopy and infiltration wells, pervious pavement, gutters, and sidewalks, street/alley retrofits into "green streets," rain barrels and cisterns, green roofs, etc. It is anticipated that completion of this project will result in some recommended improvements to the City storm sewer system. These future projects will be funded through the Storm Sewer System Spot Improvements project as funding becomes available.

As of February 2015, the project has collected field data, updated the City's GIS storm sewer layers, built computer models, and performed condition assessments on storm sewer manholes and pipes for Hooff's Run, Holmes Run, Taylor Run, Backlick Run, Cameron Run, Strawberry Run and Four Mile Run watersheds. In addition, identification of problem areas and prioritizing on the basis of the findings has been completed. Funding planned in FY 2020 will provide for updated analysis and flow modeling.

This project provides the resources for a thorough understanding of the City's storm sewer system and will assist in anticipating problems in performance and capacity allowing for proactive solutions in protecting citizens and property from stormwater flooding.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
- Sustain the natural quality of land within the City
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- N/A

Additional Operating Budget Impact

An additional impact to the operating budget is not anticipated.

Green Infrastructure in Combined Sewer Overflow (CSO) Areas

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): N/A
ORG: TBD

Project Location: Citywide
Reporting Area: Old Town, Old Town North, Braddock Road Metro
Project Category: 3 – New Facilities
Estimated Useful Life: Varies

Green Infrastructure in CSO Areas													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	1,500,000	*1,000,000*	500,000	0	0	0	0	0	0	0	0	0	500,000
Financing Plan													
Cash Capital	750,000	*500,000*	250,000	0	0	0	0	0	0	0	0	0	250,000
Sanitary Sewer Fees	750,000	*500,000*	250,000	0	0	0	0	0	0	0	0	0	250,000
Total Financing Plan	1,500,000	*1,000,000*	500,000	0	0	0	0	0	0	0	0	0	500,000
Additonal Operating Impact													
Annual Impact			0	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	15,239
Cumulative Impact			0	1,500	3,045	4,636	6,275	7,964	9,703	11,494	13,339	15,239	15,239
Changes from Prior Year CIP: No changes from prior year CIP.													

Project Description & Justification

This project provides funding from both the sanitary sewer and storm sewer funds for study, design, and construction of at least two green infrastructure demonstration projects in the combined sewer area. Green infrastructure projects will include "green alleys." Completion of these projects will provide the following benefits: increasing stormwater infiltration, reducing stormwater into the combined sewer system (CSS), providing stormwater treatment (nutrients), and decreasing the volume of combined sewer overflow (CSO) discharges. The City's renewed permit of CSS requires a reduction of five million gallons of stormwater over the next five years. This project will provide infrastructure to help the City comply with this requirement.

For the City to stay in compliance with the future CSS permits, overflows from the Combined Sewer System need to be mitigated. This is primarily because of new regulatory requirements of the bacteria Total Maximum Daily Load (TMDL) for Hunting Creek. Total cost of mitigation of these overflows can range as high as $200 million - $300 million and depends on the type and mix of technologies that get implemented.

Through the ongoing update to the City's Long Term Control Plan for the CSS, an alternatives analysis is being conducted that will result in a recommended plan and projects to comply with the regulatory requirements. Only after completion of the Long Term Control Plan Update, due to the Virginia Department of Environmental Quality in August 2016, and their subsequent approval, will the costs of the resulting projects and implementation schedule become more certain.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- T&ES Strategic Plan 2012-2015: Key Result Area III: Meet or exceed state or federal requirements of City's separate storm sewer and combined sewer system permits and maintain compliance with these environmental permits.
- Consistent with Eco-City Charter (Water Resources) and with Eco-City Action Plan, Chapter 4, Goal 4
- 2013 Sanitary Sewer Master Plan

Additional Operating Budget Impact

Additional operating costs for a green alley and a bioretention facility will be approximately $750 each annually for maintenance ($1,500 total in FY2017). Maintenance of a green alley includes vacuuming of sediments from the permeable pavement 3-4 times per year.

Stream and Channel Maintenance

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): Dept. of Project Implementation
ORG: 43411609

Project Location: Citywide
Reporting Area: Citywide
Project Category: 1 – Asset Maintenance
Estimated Useful Life: Varies

Stream & Channel Maintainence													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	12,219,584	*6,219,584*	0	1,250,000	850,000	1,200,000	450,000	450,000	450,000	450,000	450,000	450,000	6,000,000
Financing Plan													
Prior City & Stormwater Funding	6,219,584	*6,219,584*	0	0	0	0	0	0	0	0	0	0	0
Cash Capital	2,550,000	*0*	0	400,000	250,000	550,000	225,000	225,000	225,000	225,000	225,000	225,000	2,550,000
GO Bonds	3,450,000	*0*	0	850,000	600,000	650,000	225,000	225,000	225,000	225,000	225,000	225,000	3,450,000
Total Financing Plan	12,219,584	*6,219,584*	0	1,250,000	850,000	1,200,000	450,000	450,000	450,000	450,000	450,000	450,000	6,000,000
Additonal Operating Impact													
Annual Impact			0	0	0	0	0	0	0	0	0	0	0
Cumulative Impact			0	0	0	0	0	0	0	0	0	0	0

Changes from Prior Year CIP: Planned funding of $1.2 million in last year's CIP has been deferred until FY 2017 as prior year balances are sufficient to complete FY 2016 projects. Overall, total funding is decreased by $100,000 over last year's plan based on updated project timing and funding amounts provided by the department.

Project Description & Justification

This project provides funding for annual capital infrastructure improvements to various streams and channels throughout the City to preserve their capacity to carry a 100-year floodwater and for repairs to erosion damage, stream corridor degradation, grade control structures, storm sewer discharge points, and stream stabilization/restoration.

Prior year balances will be utilized to mitigate damages caused by Tropical Storm Lee, with specific projects to be completed including:

- Cameron Run Weirs #2, #3, #4, and #5 repairs;
- Backlick Run S-Curve repairs;
- Backlick Run Flume Outlet repairs.

These projects may be eligible for up to 75% reimbursement from the Federal Emergency Management Agency, and City staff will pursue reimbursement as work is completed.

Continued urbanization in the City and in Fairfax County over the years has put excessive stress on the vitality of natural streams throughout the City. This has caused erosion, loss of natural habitat and flooding issues in these streams. Designing and implementing restoration for these streams will provide the additional capacity needed to handle the added stormwater runoff from urbanization, allowing for the return of natural habitat and enhancing the health of these important resources in our City. Having access to healthy, thriving natural areas provides opportunities for people to connect with the natural world and improves the overall well-being of communities.

Prior to moving ahead with restoration projects originally planned for FY2016 and FY2017, a citywide stream study is being proposed (FY 2016/2017) which will help the City to develop overall strategy to deal with degraded streams and will assist in prioritizing the projects. FY 2018/2019 funding will be used to carry out design and construction of the top priority projects.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City
- Improve the health of City waterways
- Sustain the natural quality of land within the City
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government
- Ensure government is accountable to the community

Focus Area: Safe, Secure, & Just Community
- Reduce harm to people or property from disasters

External or Internal Adopted Plan or Recommendation

- N/A

Additional Operating Budget Impact

An additional impact to the operating budget is not anticipated.

Stormwater Utility Study

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): Office of Management and Budget
ORG: TBD

Project Location: Citywide
Reporting Area: Citywide
Project Category: 3 – New Facilities
Estimated Useful Life: N/A

Stormwater Utility Study													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	640,000	*0*	640,000	0	0	0	0	0	0	0	0	0	640,000
Financing Plan													
Cash Capital	640,000	*0*	640,000	0	0	0	0	0	0	0	0	0	640,000
Total Financing Plan	640,000	*0*	640,000	0	0	0	0	0	0	0	0	0	640,000
Additional Operating Impact													
Annual Impact			0	0	0	0	0	0	0	0	0	0	0
Cumulative Impact			0	0	0	0	0	0	0	0	0	0	0

Changes from Prior Year CIP: This is a new project added for FY 2016.

Project Description & Justification

Several stormwater capital projects identified and funded in approved CIP over next 10 years are for the City to be able to comply with C-Bay Total Maximum Daily Loads (TMDL) requirements (regulatory compliance). The projects driven by new mandates are over and above the existing level of service. Existing stormwater management program is funded by general funds and costs the dedicated 0.5 cents on the real estate tax rate exclusively for stormwater.

Stormwater Utility Study Phase I will be conducted in FY2016 to explore stormwater utility for sustainable and equitable funding of stormwater programs. This study will update the needs analysis from 2009, define the services that could be covered by the utility, and study their level and costs, both current and in future. In addition, billing units will be developed. There will be an extensive and robust public engagement process as this phase is being executed.

Based on the results of Phase I Utility Study, City Council may allocate additional resources and direct staff to commence Phase II in FY2017. Under this scenario, in Phase II, billing method and frequency will be determined, customer database will be prepared and billing systems will be developed. Credit policies along with the Stormwater Utility Ordinance will be developed and adopted in Phase II. City Council's adoption of the Utility Ordinance will be the final step towards implementation of Stormwater Utility effective FY2018.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure the fiscal strength of City government
- Ensure government is accountable to the community

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
- Sustain the natural quality of land within the City
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

External or Internal Adopted Plan or Recommendation

- Consistent with the Eco-City Charter and Eco-City Action Plan 2030, adopted by City Council June 2008 and June 2009 respectively
- T&ES Strategic Plan: Key Result Area – Meet or exceed state and federal requirements of the City's MS4 and combined sewer permits
- Stormwater Utility staff presentation to City Council December 10, 2014

Additional Operating Budget Impact

While implementation of stormwater utility will provide sustainable funding source for stormwater funding outside of the General Funds, there are start-up costs. 1.0 FTE ($140,000) is being requested in FY2016. The FTE will be capitalized and charged to this project. Costs of the position are not shown in the additional operating impact chart above since they are being capitalized. Additional FTEs may be required in FY 2017 to support this project.

MS4 / Total Maximum Daily Load (TMDL) Compliance Water Quality Improvements

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): N/A
ORG: TBD

Project Location: Citywide
Reporting Area: Citywide
Project Category: 3 – New Facilities
Estimated Useful Life: 50+ years

MS4-TMDL Compliance Water Quality Improvements													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	28,900,000	*500,000*	0	400,000	500,000	500,000	3,000,000	3,000,000	3,500,000	3,500,000	7,000,000	7,000,000	28,400,000
Financing Plan													
Cash Capital	9,910,000	*500,000*	0	400,000	250,000	250,000	750,000	700,000	750,000	750,000	2,750,000	2,810,000	9,410,000
GO Bonds	18,990,000	*0*	0	0	250,000	250,000	2,250,000	2,300,000	2,750,000	2,750,000	4,250,000	4,190,000	18,990,000
Total Financing Plan	28,900,000	*500,000*	0	400,000	500,000	500,000	3,000,000	3,000,000	3,500,000	3,500,000	7,000,000	7,000,000	28,400,000
Additonal Operating Impact													
Annual Impact			0	0	0	50,000	51,500	53,045	100,000	103,000	150,000	154,500	662,045
Cumulative Impact			0	0	0	50,000	101,500	154,545	254,545	357,545	507,545	662,045	662,045

Changes from Prior Year CIP: Funding in the amount of $7.0 million is added in FY 2025. No other changes from the prior year CIP.

Project Description & Justification

The Virginia Department of Environmental Quality (VDEQ) issued the City's new Municipal Separate Storm Sewer System (MS4) Permit on July 1, 2013 that specifies and imposes City-specific stormwater nutrients and sediment reduction targets for the Chesapeake Bay (C-Bay) Total Maximum Daily Load (TMDL) through the permit. Accordingly, the new permit requires the City to implement practices sufficient to achieve 5% of the reduction targets during first 5-year permit (2013-2018) and 40% of reduction targets by the end of the 10-year period (2023).

The City has been discussing the options available to comply with these targets through Stormwater Steering Committee and Stormwater Workgroup. Additionally, the City completed the Chesapeake Bay TMDL Compliance Analysis and Options (Analysis) report that looked into options and alternatives for treating stormwater and corresponding costs. As the specific projects to achieve these reductions are being discussed and developed, this budget is based on funding that can be used to implement a diverse mix of strategies to achieve a large portion of the required reductions in the next ten years.

In addition to these regional facilities, stormwater quality retrofits of City facilities and ROW will be required to meet the reductions. The budgetary estimates were developed with engineers from the firms conducting the Chesapeake Bay TMDL Compliance Analysis and Options Study. Please note that funding requests, along with the inclusion of the Lake Cook, Cameron Station Pond Retrofit and City Facilities BMP projects will likely satisfy the first permit cycle (2013 - 2018 permit). For FY 2019 and beyond, estimates are provided based on staff's best professional judgment and may need to be revised as the 2018 permit requirements and as the regulators' expectations become clearer.

(Continued on next page)

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
- Sustain the natural quality of land within the City
- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- Consistent with the Eco-City Charter and Eco-City Action Plan 2030, adopted by City Council June 2008 and June 2009 respectively
- T&ES Strategic Plan: Key Result Area – Meet or exceed state and federal requirements of the City's MS4 and combined sewer permits

Additional Operating Budget Impact

Operating impact is to cover for the maintenance of the retrofit facilities that will be coming online is estimated at $50,000 in FY 2019 and increasing to $150,000 by FY 2024. Costs will be lower in FY 2019 as the facilities that come online will be newer. With passing time, a more rigorous inspection and maintenance program will need to be implemented for the City to continue to get reduction credits from the implemented practices.

MS4 / Total Daily Maximum Load (TMDL) Compliance Water Quality Improvements (Continued)

Project Description and Justification (Continued)

This is primarily because of new regulatory requirements of Chesapeake Bay TMDLs for nutrients and sediments, bacteria TMDLs for Hunting Creek, and Four Mile Run. Total cost of compliance and mitigation for FY 2016 – 2025 may range as high as $50 million and depends on the type and mix of technologies implemented. The cost of compliance beyond 2023 (i.e. FY 2026 – 2033) may be an additional $100 million.

Storm Sewer System Spot Improvements

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): Dept. of Project Implementation
ORG: 52411855

Project Location: Citywide
Reporting Area: Citywide
Project Category: 1 – Asset Maintenance
Estimated Useful Life: Varies

Storm Sewer System Spot Improvements													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	10,360,221	*7,660,221*	0	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	2,700,000
Financing Plan													
Prior City & Stormwater Funding	7,660,221	*7,660,221*	0	0	0	0	0	0	0	0	0	0	0
GO Bonds	2,700,000	*0*	0	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	2,700,000
Total Financing Plan	10,360,221	*7,660,221*	0	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	2,700,000
Additonal Operating Impact													
Annual Impact			0	0	0	0	0	0	0	0	0	0	0
Cumulative Impact			0	0	0	0	0	0	0	0	0	0	0

Changes from Prior Year CIP: Funding planned in FY 2016 deferred until FY 2017 as prior year balances are available to complete previously identified Storm Sewer System projects. Funding added for FY 2025. No tother changes from prior year CIP.

Project Description & Justification

This project provides funding for essential capital infrastructure improvements on the City's storm sewer system. These projects are identified as reconstruction projects due to deterioration or need additional capacity to reduce flooding.

Prior year project balances will be utilized for projects listed on the next page.

Completion of these projects will improve the City's storm sewer capital infrastructure while mitigating the impacts of flooding. Regular capital infrastructure improvements can reduce the number of pipe collapses while reducing emergency repair costs caused by deferred maintenance.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

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Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- N/A

Additional Operating Budget Impact

An additional impact to the operating budget is not anticipated.

Storm Sewer System Spot Improvements (Continued)

Current Storm Sewer Spot Improvement Projects

Project	Description	Status
DASH Facility Stormwater Outfall	This project includes design and construction of stormwater management system to prevent flooding. The original concept to improve the outfall across railroad ROW was deemed not feasible because of constructability issues. Alternatives being evaluated include providing detention storage with appropriate overland relief.	Currently under alternatives evaluation. Design will begin in FY2016 with construction in FY2017/2018.
600 Russell Road	Provide expanded inlets to reduce ponding and flooding in the street.	Under design. Construction summer 2015.
Bishop Lane Drainage Improvement	Flooding/ponding in the street. Alternative being studied includes green technology such as bioretention filter because of lack of availability of sewer nearby.	Design/evaluation in progress.
Misc. sewer lining and repairs - Near Virginia Avenue	Project involves slip lining a deteriorated sewer.	Inspection/ evaluation and Design FY2015. Construction FY2016.
Drainage Improvements 600 Block N Columbus Street	Remediate localized flooding/ponding. Alternatives being evaluated include green infrastructure.	Alternative evaluation FY2015. Design and construction FY2016/FY2017.
800 Block Mt. Vernon Avenue	Localized flooding/ponding. Project includes installation and improvement of storm sewer system. Design is currently being shared with the neighbors for their comments and input.	Construction in FY2015/FY2016

Lake Cook Stormwater Management

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): Dept. of Project Implementation
ORG: TBD

Project Location: Eisenhower Avenue
Reporting Area: Seminary Hill/Strawberry Hill
Project Category: 3 – New Facilities
Estimated Useful Life: 30 years

Lake Cook Stormwater Management													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	2,700,000	*2,700,000*	0	0	0	0	0	0	0	0	0	0	0
Financing Plan													
Prior City Funding	1,500,000	*1,500,000*	0	0	0	0	0	0	0	0	0	0	0
Stormwater Local Asst. Fund	1,200,000	*1,200,000*	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	2,700,000	*2,700,000*	0	0	0	0	0	0	0	0	0	0	0
Additonal Operating Impact													
Annual Impact			0	0	100,000	103,000	106,090	109,273	112,551	115,927	119,405	122,987	889,234
Cumulative Impact			0	0	100,000	203,000	309,090	418,363	530,914	646,841	766,246	889,234	889,234

Changes from Prior Year CIP: No changes from prior year CIP. This is an active project with no additional funding required.

Project Description & Justification

The Virginia Department of Environmental Quality (VDEQ) issued the City's new Municipal Separate Storm Sewer System (MS4) Permit on July 1, 2013 that specifies and imposes City-specific stormwater nutrients and sediment reduction targets for the Chesapeake Bay (C-Bay) Total Maximum Daily Load (TMDL) through the permit. Accordingly, the new permit requires the City to implement practices sufficient to achieve 5% of the reduction targets during first 5-year permit (2013-2018) and 40% of reduction targets by the end of the 10-year period (2023).

Retrofits to existing large regional stormwater facilities will provide additional pollutant removal either by enhancing the treatment efficiency and/or in combination to increasing the amount of area draining to the facility, and is one of the most cost effective strategies to meet the identified pollution reduction requirements. In order to comply with these targets, the City has been discussing these strategies and other options available through a Stormwater Steering Committee and Stormwater Workgroup. The City also completed the Chesapeake Bay TMDL Compliance Analysis and Options report that looked into options and alternatives for treating stormwater and corresponding costs.

In order to capitalize on an opportunity available to seek a stormwater improvements grant, the City pursued and received $1.2 million for the Lake Cook retrofit project, which was matched by the City. Once completed, Lake Cook is expected to treat stormwater from a total of approximately 300 acres, including approximately 100 impervious acres and is expected to meet approximately 10% of the total pollution reduction requirements of the City. This project also offers an opportunity to enhance the recreational elements of this facility, making it more of an amenity than it is currently.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
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- Promote an attractive urban environment that reflects our history and provides well-functioning infrastructure

Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- Consistent with the Eco-City Charter and Eco-City Action Plan 2030, adopted by City Council June 2008 and June 2009 respectively
- T&ES Strategic Plan: Key Result Area – Meet or exceed state and federal requirements of the City's MS4 and combined sewer permits

Additional Operating Budget Impact

Average operational costs based on published studies of such facilities with enhanced amenities and visibility are estimated at $100,000 annually beginning in FY 2018, with a three percent annual inflation factor included each year thereafter.

Cameron Station Pond Retrofit

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): Dept. of Project Implementation
ORG: TBD

Project Location: Cameron Station
Reporting Area: Landmark/Van Dorn
Project Category: 3 – New Facilities
Estimated Useful Life: 30 years

Cameron Station Pond Retrofit													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	3,500,000	*0*	2,250,000	625,000	625,000	0	0	0	0	0	0	0	3,500,000
Financing Plan													
GO Bonds	1,750,000	*0*	500,000	625,000	625,000	0	0	0	0	0	0	0	1,750,000
Stormwater Local Asst. Fund	1,750,000	*0*	1,750,000	0	0	0	0	0	0	0	0	0	1,750,000
Total Financing Plan	3,500,000	*0*	2,250,000	625,000	625,000	0	0	0	0	0	0	0	3,500,000
Additonal Operating Impact													
Annual Impact			0	0	0	0	135,000	139,050	143,222	147,518	151,944	156,502	873,235
Cumulative Impact			0	0	0	0	135,000	274,050	417,272	564,790	716,733	873,235	873,235

Changes from Prior Year CIP: A state grant in the amount of $1.75 was awarded to the City in FY 2015 for this project. Those funds are appropriated in FY 2016, and allow the City to reduce its contribution to this project by $1.75 million.

Project Description & Justification

Virginia Department of Environmental Quality (VDEQ) issued the City's new Municipal Separate Storm Sewer System (MS4) Permit on July 1, 2013 that specifies and imposes City-specific stormwater nutrients and sediment reduction targets for the Chesapeake Bay (C-Bay) Total Maximum Daily Load (TMDL) through the permit. Accordingly, the new permit requires the City to implement practices sufficient to achieve 5% of the reduction targets during first 5-year permit (2013-2018) and 40% of reduction targets by the end of the 10-year period (2023).

Retrofits to existing large regional stormwater facilities will provide additional pollutant removal either by enhancing the treatment efficiency and/or in combination to increasing the amount of area draining to the facility and is one of the most cost effective strategies to meet the identified pollution reduction requirements. In order to comply with these targets, the City has been discussing these strategies and other options available to the City through a Stormwater Steering Committee and Stormwater Workgroup. The City also completed the Chesapeake Bay TMDL Compliance Analysis and Options report that looked into options and alternatives for treating stormwater and corresponding costs.

In FY 2015, City staff pursued and received $1.75 million in a grant from "Stormwater Local Assistance Fund" by leveraging an equivalent amount of funding from this project. This reduced the City funded contribution to this project by half of the original budgeted amount.

A Cameron Station Pond Retrofit is a very cost effective strategy to meet City's pollution reduction requirements. This project also offers an opportunity to enhance the recreational elements of this facility, making it more of an amenity than it is currently.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

- Improve the health of City waterways
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Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- Consistent with the Eco-City Charter and Eco-City Action Plan 2030, adopted by City Council June 2008 and June 2009 respectively
- T&ES Strategic Plan: Key Result Area – Meet or exceed state and federal requirements of the City's MS4 and combined sewer permits

Additional Operating Budget Impact

Average operational costs based on published studies of such facilities with enhanced amenities and visibility are estimated at $135,000 annually beginning in FY 2020, with a three percent annual inflation factor included each year thereafter.

City Facilities Stormwater Best Management Practices (BMPs)

Document Subsection: Stormwater Management
Managing Department: Transportation & Environmental Services
Supporting Department(s): Dept. of Project Implementation
ORG: TBD

Project Location: Citywide
Reporting Area: Citywide
Project Category: 3 – New Facilities
Estimated Useful Life: 25 years

City Facilities Stormwater Best Management Practices (BMPs)													
	A (B+M)	*B*	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	*Through FY 2015*	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total FY 2016-2025
Expenditure Budget	1,545,000	*0*	0	412,000	1,133,000	0	0	0	0	0	0	0	1,545,000
Financing Plan													
Cash Capital	445,000	*0*	0	212,000	233,000	0	0	0	0	0	0	0	445,000
GO Bonds	1,100,000	*0*	0	200,000	900,000	0	0	0	0	0	0	0	1,100,000
Total Financing Plan	1,545,000	*0*	0	412,000	1,133,000	0	0	0	0	0	0	0	1,545,000
Additonal Operating Impact													
Annual Impact			0	0	0	25,000	25,750	26,523	27,318	28,138	28,982	29,851	191,562
Cumulative Impact			0	0	0	25,000	50,750	77,273	104,591	132,728	161,710	191,562	191,562

Changes from Prior Year CIP: Planned funding in FY 2016 & 2017 is shifted to FY 2017 & 2018 to allow to for completion of the Cameron Station Pond Retrofit and Lake Cook Stormwater Management projects. Costs are increaed by $45,000 over last year's CIP to account for 3% inflation.

Project Description & Justification

The Virginia Department of Environmental Quality (VDEQ) issued the City's new Municipal Separate Storm Sewer System (MS4) Permit on July 1, 2013 that specifies and imposes City-specific stormwater nutrients and sediment reduction targets for the Chesapeake Bay (C-Bay) Total Maximum Daily Load (TMDL). Accordingly, the approved permit requires the City to implement practices sufficient to achieve 5% of the reduction targets during the first 5-year permit and 40% of the reduction target by the end of 10-year period.

One of the strategies to meet the identified pollution reduction requirements is by retrofitting existing City properties that currently do not provide stormwater treatment with stormwater facilities to provide the additional pollutant removal. The City has been discussing these and other options available to comply with these targets through a Stormwater Steering Committee and a Stormwater Workgroup. The City has also completed the Chesapeake Bay TMDL Compliance Analysis and Options (Analysis) report that looked into options and alternatives for treating stormwater and corresponding costs.

Working closely with the General Services and Recreation, Parks and Cultural Activities Departments, the following three locations have been identified for stromwater retrofits:

- City maintenance facility at Luckett Field
- T&ES/Recreation operations at 2900 Business Center Drive
- City traffic shop at Colvin Street

Once completed these retrofits are expected to treat stormwater from a total of approximately 4-8 impervious acres. These sites have been selected because of the facilities operational stormwater impacts and their relatively high percentage of impervious acreage.

City's Strategic Plan & Budget Guidance

Primary Strategic Plan Goal: Goal 2 – Health & Environment

Focus Area: Livable, Green, and Prospering City

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Focus Area: Accountable, Effective, & Well-Managed Government

- Ensure government is accountable to the community

External or Internal Adopted Plan or Recommendation

- Consistent with the Eco-City Charter and Eco-City Action Plan 2030, adopted by City Council June 2008 and June 2009 respectively
- T&ES Strategic Plan: Key Result Area – Meet or exceed state and federal requirements of the City's MS4 and combined sewer permits

Additional Operating Budget Impact

Average operational costs based on published studies of such facilities with enhanced amenities and visibility are estimated at $25,000 annually beginning in FY 2019, with a three percent annual inflation factor included each year thereafter.