Stormwater Management and Other Neighborhood Improvements

PROGRAM DESCRIPTION

The Stormwater Management and Other Neighborhood Improvements section consists of: Stormwater Control, Streetlights and the County Neighborhood Improvement Program.

LINK TO THE COMPREHENSIVE PLAN

Fairfax County's Comprehensive Plan has established a number of objectives and policies in order to:

- ✓ Identify, protect and enhance an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County.
- ✓ Prevent and reduce pollution of surface and groundwater resources in order to protect and restore the ecological integrity of streams in Fairfax County.
- ✓ Apply better site design and low impact development (LID) techniques, and pursue commitments to reduce stormwater runoff volumes and peak flows, to increase groundwater recharge, and to increase preservation of undisturbed areas.
- ✓ Provide for a comprehensive drainage improvement and stormwater management program to maximize property protection and environmental benefits throughout the watershed.
- ✓ Provide a system of drainage facilities that prevents or minimizes structure flooding, stream degradation and traffic disruption in an efficient, cost-effective and environmentally sound manner.

Source: 2007 Edition of the Comprehensive Plan, Policy Plan Element, Environment, Land Use, and Public Facilities Sections, as amended.

CURRENT PROGRAM INITIATIVES

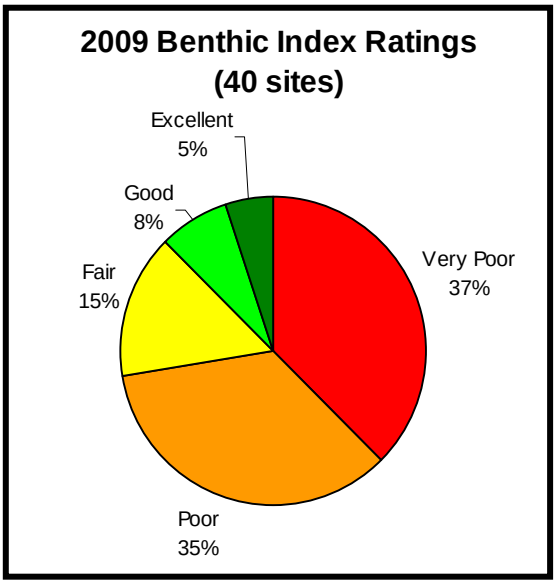
Stormwater Management Program

Fairfax County's Stormwater Management program is currently being managed on a comprehensive watershed basis. The program consists of: Regulatory Compliance, Dam Safety and Facility Rehabilitation, Stream and Water Quality, Emergency and Flood Control, Conveyance System Rehabilitation, contributory funding requirements and Operational Support. The long-range goal or mission for the stormwater program is dictated by the County's need to preserve and restore the natural environment and water resources, while being in full compliance with all applicable federal and state laws and mandates. Many of the requirements are derived from the State's Chesapeake Bay Initiatives, Municipal Separate Storm Sewer System Permit (MS4), and other Clean Water Act requirements and County ordinance and policies, such as the Water Supply Protection Overlay District. In order to comprehensively address program requirements and strategies for restoring water quality on a holistic basis, updated watershed management plans have been completed.

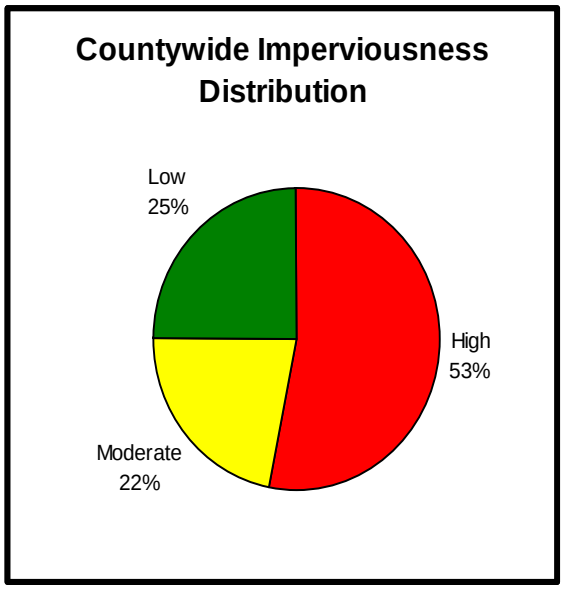
Watershed Planning and Implementation

Plans for all 30 County watersheds have been completed. Previously prepared watershed master plans developed during the 1970s did not reflect changes in stream conditions resulting from land use practices, water quality standards and environmental goals, most of which have evolved over the last 30 years. The watershed plans provide targeted strategies for addressing stream health given current and future land use practices and relative stream conditions.

As depicted on graph A below and based on the 2009 stream monitoring, less than 15 percent of the County's streams are in good to excellent biological health condition. This condition is determined using an Index of Biological Integrity (IBI) which evaluates stream ecological health based on the community structure of bottom-dwelling aquatic invertebrates inhabiting the streams. Stream degradation becomes apparent when imperviousness reaches 10-20 percent within a watershed. High levels of degradation occur as imperviousness exceeds 20 percent. During previous decades, prior to implementation of modern stormwater controls, the County's percent of imperviousness increased drastically which contributed to the current degradation of the streams. As depicted on the graph B below, more than half of the County land area has imperviousness at or above 20 percent (high). In addition, 22 percent of the County land area is between 10-20 percent imperviousness (moderate).



A



B

The Federal Clean Water Act and Virginia state laws require Fairfax County to meet water quality standards for surface streams and groundwater. The County discharges stormwater from its storm drainage network into the waters of the state and must comply with all pertinent water quality standards and conditions established by the MS4 permit. The permit conditions require that the County have a comprehensive stormwater management program that includes inspection of existing stormwater facilities, watershed planning, public outreach, monitoring and implementation of practices to improve stormwater quality.

In addition to the permit conditions, Virginia and other signature states related to the Chesapeake Bay 2000 Agreement have prepared "Tributary Strategies" to set specific targets for reduction and capping of nutrients and sediment pollutants entering the Bay through its various tributaries, such as the Potomac River. The Potomac River Basin Tributary Strategy was completed in 2005 and established state-wide reduction goals for point source (wastewater treatment plants) and non-point source pollution. However, the Tributary Strategies are being replaced by the State's Watershed Improvement Plans (WIP) in response to impending revised requirements for a Chesapeake Bay-wide Total Maximum Daily Load (TMDL). The TMDL for the Chesapeake Bay is expected to establish a "pollution diet", or pollution load reduction targets needed to remove the Bay from the impaired waters list. The requirements for Bay states and localities are also being driven by a Presidential Executive Order number 13508, of May 2009 that called for more stringent actions, increased accountability and firm deadlines. The implementation phase of the TMDL will involve increased measures tied to firmly established milestones and an ultimate deadline of accomplishment by 2025. Through the stormwater program and other efforts, the County is doing its part to increase water pollution control measures to effectively improve local stream conditions, comply with increasing regulations and help restore the Chesapeake Bay.

While every effort has been made to accurately reflect the 5-year capital improvement plan for the stormwater program, there are currently multiple issues that are in various stages of the regulatory and permitting processes that will possibly have significant funding impacts on the Stormwater program. Increases in regulatory requirements associated with the 5-year MS4 permit, the impending Chesapeake Bay-wide TMDL, and increased State mandated requirements in the Dam Safety program impact the funding requirements on a continual basis. Unforeseen flood mitigation efforts resulting from County-wide flooding events require a significant investment to implement corrective actions and correct failing and deficient storm drainage systems that are impacting county residential and commercial properties. In addition to these funding impacts to the stormwater program, the transfer of the MS4 permit program for Fairfax County Public Schools (FCPS) to County management, represents added responsibility and funding to the stormwater program as well.

Additional, less defined funding impacts to the stormwater program include long term stormwater management maintenance requirements of County facilities that are designed and built using innovative stormwater management systems, such as Low Impact Development Systems (LIDS). Past stormwater maintenance at County-owned and operated facilities traditionally consisted of maintenance of catch basins, storm pipes and surface ponds. However, to meet current stormwater quality requirements, more extensive and complex stormwater management systems are being developed with "Best Management Practices" for the treatment of stormwater runoff. These water quality systems will require more routine and more complex operational and maintenance efforts to meet and comply with the stormwater permit. Without the proper on-going operation and maintenance, the systems will likely fail, requiring more extensive costs to reconstruct the systems to function as designed. As these water quality systems and stormwater facilities come on-line, recurring maintenance will be required.

Financing the Stormwater Program

As part of the FY 2010 Adopted Budget Plan, a special service district was created to support the Stormwater Management Program and provide a dedicated funding source for both operating and capital project requirements, as authorized by Va. Code Ann. Sections 15.2-2400. Since FY 2006, the Board of Supervisors had dedicated the value of one penny of the real estate tax, or approximately $20 million annually to stormwater capital projects. In FY 2009, due to budget constraints, staffing and operating costs began to be charged to the stormwater penny fund, resulting in an approximate 50 percent reduction in funding for capital project support. The current stormwater service rate of $0.15 per $100 of assessed real estate value has been in place since FY 2011. In FY 2013, the stormwater service rate is increase $0.005 for a total of $0.020 per $100 of assessed real estate value.

This rate increase is required to meet the increasing federal and state regulatory requirements pertaining to the Municipal Separate Storm Sewer System (MS4) Permit requirements, and State and Federal mandates associated with the Chesapeake Bay. It should be noted that FY 2013 represents a phased approach for funding and staffing to support the anticipated regulatory increases. The FY 2013 levy of $0.020 will generate approximately $40 million, supporting $15 million for staff and operational costs, and $25 million for capital project implementation and infrastructure reinvestment, regulatory requirements, dam safety, and contributory funding requirements. This dedicated capital funding support will allow the County to implement capital projects in a more efficient manner and begin to address state and EPA stormwater requirements.

In summary, Stormwater funding is essential to protect public safety, preserve property values and support environmental mandates, such as those aimed at protecting local streams and the Chesapeake Bay. Projects include: repairs to stormwater infrastructure, measures to improve water quality, such as stream stabilization, rehabilitation and safety upgrades of dams, repair and replacement of underground pipe systems and surface channels, structural flood proofing and Best Management Practices (BMP) site retrofits. This funding also supports increased public outreach efforts and stormwater monitoring activities. The approach to capital investment in stormwater management will be to improve infrastructure reinvestment cycles, and increase capital project implementation schedules to responsibly manage stormwater runoff within Fairfax County, while maintaining compliance with increasing regulatory requirements and operational requirements. Focus will be provided to balance effectiveness and efficiencies through management of staff resources balanced with delivery of services through outsourced opportunities.

Other Neighborhood Improvements

Other neighborhood improvement projects include streetlights and the implementation of sidewalks, curbs, gutters and storm sewers in older neighborhoods. The County Streetlight Program is designed to respond to the desires of citizens for additional community lighting in the interest of promoting the Crime Deterrence and Hazardous Intersection programs. New streetlights can be installed at the County's expense based on citizens' requests, or at the developer's expense in new developments. The costs of this program fund the installation of streetlights and operating costs are supported by the General Fund. In recent years, the Board of Supervisors had established a new approach for funding streetlight projects. "Prioritized Capital Projects" budgets were established for each Supervisor District. If surplus funding is identified throughout the fiscal year and dedicated for this program, each Board member receives an equal portion of the funding and works with the Department of Public Works and Environmental Services (DPWES) to address the top priority projects.

There are several projects related to streetlights in the County that need to be addressed in future years. First, existing streetlights will need to be upgraded to current standards that are impacted by VDOT road improvement projects. Funding for these upgrades will be adjusted each year based on the magnitude of VDOT construction activities. Next, there are an estimated 27,000 inefficient mercury vapor (MV) streetlights in the County that need to be converted to high pressure sodium vapor (HPSV) cut-off streetlights. Conversion of the County's MV streetlight inventory will need to be addressed in the near future as a result of the Environmental Protection Agency's (EPA) mandate to stop the manufacturing and importation of a key MV streetlight fixture component in order to force the elimination, through attrition, of MV streetlights. This effort will further bring the County streetlight program into compliance with the Board of Supervisor's desire to use cut-off streetlight fixtures to reduce light pollution and promote the Dark Skies Initiative. It is envisioned that it will take several years to complete the conversion of the approximately 27,000 MV streetlights. Further, the County will also need to replace an estimated 1,400 obsolete MV open streetlight fixtures with HPSV cut-off streetlight fixtures on a countywide basis. The open streetlight fixtures installed in the 1960s and 1970s are grossly inefficient for street lighting and produce a great deal of glare. Replacing the open streetlight fixtures with HPSV cut-off streetlight fixtures is also consistent with the large goal of converting the estimated 27,000 MV streetlights currently in the County's inventory, as was mentioned above.

CURRENT PROJECT DESCRIPTIONS

1. **Stormwater Regulatory Program** (Countywide). This is a continuing program to provide permit administration, public outreach programs, stormwater facility inspections and assessment and stormwater monitoring programs associated with the MS4 permit. The County is required by Federal Law to operate under the conditions of a state issued Municipal Separate Storm Sewer System (MS4) Permit. The MS4 Permit allows the County to discharge stormwater from its stormwater systems into state and federal waters. The County currently owns and/or operates approximately 7,000 piped outfalls that are governed by the permit. The Current Permit was issued in 2002 and expired in 2007, and the County has been operating under a state issued administrative extension, while the state and the EPA agree to new permit requirements. The more recent MS4 permits that have been issued by EPA, and the conditions in the draft permit prepared for the County, contain conditions that will require significant enhancements to all facets of the permit. In addition to the requirements outlined in the draft permit conditions, in a recent audit of the County's program, EPA identified the need for the County to initiate a high risk and industrial site inspection program for private properties throughout the County. This is anticipated to require a robust inspection and enforcement program to monitor stormwater discharges from all industrial facilities in the County. The permit further requires the County to provide stormwater management and stormwater control training to all County employees, increase water quality monitoring efforts, better document the stormwater management facility inventory, and enhance public out-reach and education efforts, and to thoroughly document all of these enhanced efforts. County staff is currently developing the procedures to implement the additional requirements. Additional funding and staff are required to develop, manage and initiate these newly enhanced federally mandated programs.

2. **Emergency and Flood Response Program** (Countywide). This program supports flood control projects resulting from storm events that impacted storm systems and flooded residential properties.

3. **Dam Safety and Facility Rehabilitation** (Countywide). The County currently has over 6,000 Stormwater management facilities in service that range in size from small rain gardens to large state regulated flood control dams, and by permit is responsible for inspecting and maintaining both County owned and privately owned facilities. This inventory increased by over 175 facilities between FY 2010 and FY 2011, and is projected to continually increase as new developments and redevelopment sites are required to install stormwater management controls. In addition, the County is required to provide a facility retrofit program to improve stormwater management controls on all existing stormwater management facilities that were developed and constructed prior to current standards being in place. This program includes maintaining the control structures, including the dams that control and treat the water flowing through County owned facilities. This program also includes the removal of sediments that occur in both wet and dry stormwater management facilities to ensure that adequate capacity is maintained to treat the stormwater. This program results in approximately 25 retrofit projects annually that require redesign and construction management activities, as well as contract management and maintenance responsibilities. Additionally, this program funds the next phase of the Kingstowne Park Dam, which failed in October 2010.

Popes Head View - Before
(Dam Rehabilitation)

Popes Head View - After
(Dam Rehabilitation)

4. **Conveyance System Rehabilitation** (Countywide). This continuing project provides inventory inspection and assessment services for repair and rehabilitation of storm drainage conveyance systems and stormwater drainage structures in the County. The County owns and operates approximately 1,600 miles of underground stormwater pipe and paved channels with estimated replacement value of over one billion dollars. The County began performing internal inspection of the pipes in FY 2006. Of the initial pipes inspected, over 5 percent were in complete failure with an additional 15 percent requiring immediate repair. It is estimated that a fully funded rehabilitation and reinvestment program would require an investment of approximately $10 million per year. The increased permit regulations relate to the nearly 1,600 miles of existing conveyance systems and 43,000 stormwater structures. The permit requirements do not address the current backlog of operational maintenance and rehabilitation needs of the entire stormwater conveyance system infrastructure, but are additive by significantly increasing inspection, reporting and management actions related to the management of the stormwater infrastructure system. Additional funding and staff are required to review the digital imaging of pipe interiors, and develop corrective solutions that require design and construction management and oversight responsibilities. Acceptable industry standards indicate that one dollar re-invested in infrastructure saves seven dollars in the assets life, and $70 dollars if asset failure occurs. The goal of this program is to inspect pipes on a 10-year cycle, and rehabilitate pipes and paved channels before total failure occurs.

Briar Ridge - Before
(Dranesvile District, Pimmit Run Watershed)

Briar Ridge - After
(Dranesvile District, Pimmit Run Watershed)

5. **Stream and Water Quality Improvements** (Countywide). This project supports the implementation of projects generated by the 30 watershed master plans as well as flood control projects, citizen response projects and other special project needs meeting the established project implementation criteria. This program funds water quality projects necessary to mitigate the impacts to local streams and the Chesapeake Bay resulting from urban stormwater runoff. This includes water quality projects such as, the construction of stormwater management ponds, implementing low impact development techniques on stormwater facilities, stream restorations and approximately 1,700 water quality projects identified in the completed countywide Watershed Plans. In addition to the new permit requirements, the EPA, who is the Federal regulator that oversees the Federal Clean-Water Act, which establishes the basis of MS4 permit, recently completed an audit of the County's current Stormwater program in June 2011, and has initially indicated several elements of the program are non-compliant. The full impact of the audit findings have not been finalized, and the penalty's associated with audit findings have not yet been issued. Additional funding and staffing is a phased approach towards the anticipated requirements for meeting the Chesapeake Bay Total Maximum Daily Load (TMDL) requirements. TMDLs are the regulatory process by which pollutants entering impaired water bodies are reduced. The Chesapeake Bay TMDL was established by EPA as the result of a law suit and requires that MS4 communities, as well as other dischargers, significantly reduce the nitrogen, phosphorous and sediment loads entering waters draining to the Bay by 2025. Compliance with the Bay TMDL will require the County to undertake construction of new stormwater facilities, retrofitting existing facilities and properties, and increasing maintenance of existing and new facilities. The Bay TMDL facility retrofit requirement is additive to the current design and construction efforts of the 1,700 Watershed Plan projects and ongoing stream and flood mitigation projects. Preliminary estimates indicate that the projects needed to bring the County's stormwater system into compliance with the Bay TMDL could cost in the range of $70 to $90 million, per year.

6. **Stormwater Related Contributories** (Countywide)**.** This project provides funding for contributions associated with the Northern Virginia Soil and Water Conservation District (NVSWCD), and the Occoquan Watershed Monitoring Program (OWMP). The NVSWCD is an independent subdivision of the Commonwealth of Virginia that provides leadership in the conservation and protection of Fairfax County's soil and water resources. The goal of the NVSWCD is to continue to improve the quality of the environment and general welfare of the citizens of Fairfax County by providing them with a means of dealing with soil, water conservation and related natural resource problems. It provides County agencies with comprehensive environmental evaluations for proposed land use changes with particular attention to the properties of soils, erosion potential, drainage and the impact on the surrounding environment. NVSWCD has consistently been able to create partnerships and leverage state, federal and private resources to benefit natural resources protection in Fairfax County. The OWMP and the Occoquan Watershed Monitoring Laboratory (OWML) were established to ensure that water quality is monitored and protected in the Occoquan Watershed. Given the many diverse uses of the land and water resources in the Occoquan Watershed (agriculture, urban residential development, commercial, and industrial activity, water supply, and wastewater disposal), the OWMP provides a critical role as the unbiased interpreter of basin water quality information.

7. **Developer Defaults** (Countywide). The Developer Default project is a continuing program for the purpose of completing private development projects on which developers have defaulted. There has been an increased level of activity for this program in recent years, and current projections suggest this trend will continue. This program is supported by developer bonds and the General Fund.

8. **Payments of Interest on Conservation Bonds** (Countywide). This project provides for payments to developers for interest earned on conservation bond deposits. The County requires developers to make deposits to ensure the conservation of existing natural resources. Upon satisfactory completion of the project, the developer is refunded the deposit with interest. Funding varies from year to year and is based on prior year actual expenditures and current interest rates.

9. **Streetlights** (Countywide). This is an on-going project which provides for the installation of streetlights on a countywide basis. In recent years, the Board of Supervisors had established a new approach for funding streetlight, trails and sidewalk projects. A new program entitled "Prioritized Capital Projects" had been established for each Supervisor District. If surplus funding is identified throughout the fiscal year and dedicated for this program, each Board member receives an equal portion of the funding and works with the Department of Public Works and Environmental Services (DPWES) to address the top priority projects.

10. **Minor Streetlight Upgrade** (Countywide). This program is for the upgrading of existing streetlights that do not meet current illumination standards for roadways, based on citizens' requests.

11. **Survey Control Network Monumentation** (Countywide). This continuing project supports the establishment, maintenance and publication of survey control monuments. These monuments, used by the private and public sector, are the terrestrial framework for geospatial control of surveying, mapping and land development projects. The survey control monuments provide the spatial control for the County GIS system. This monumentation work is necessary to assist Surveyors and Engineers in developing site plans in accordance with the requirements of the Fairfax County Public Facilities Manual.

12. **Emergency Directives Program** (Countywide). This is a continuing project to support emergency property maintenance issues associated with increases in foreclosed properties in the County. Funding provides for abatement services of both emergency and non-emergency directives related to health and safety violations, grass mowing violations and graffiti removal.

13. **Developer Streetlight Program** (Countywide). This is a continuing program to support the installation of streetlights throughout the County. The County coordinates with Virginia Power for the installation of the streetlights throughout the County. Developers then make direct payments to the County. Upon completion of the installation, the streetlights are incorporated into the Fairfax County Streetlight Program inventory. This program is offset entirely by anticipated payments from developers.

PROJECT COST SUMMARIES
STORMWATER MANAGEMENT AND OTHER NEIGHBORHOOD IMPROVEMENTS
($000's)

	Project Title/ Project Number	Source of Funds	Budgeted or Expended Through FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	Total FY2013-FY2017	Total FY2018-FY2022	Total Project Estimate
	STORMWATER MANAGEMENT										
1	Stormwater Regulatory Program / FX0700	S	***C***	***5,000***	5,000	5,000	5,000	5,000	25,000	25,000	50,000
2	Emergency and Flood Response Projects / FX8000	S	***C***	***900***	900	900	900	900	4,500	4,500	9,000
3	Dam Safety and Facility Rehabilitation / FX0400	S	***C***	***5,114***	5,114	5,114	5,114	5,114	25,570	25,570	51,140
4	Conveyance System Rehabilitation / FX0600	S	***C***	***5,500***	5,500	5,500	5,500	5,500	27,500	27,500	55,000
5	Sream and Water Quality Improvements / FX0100	S	***C***	***8,000***	8,000	8,000	8,000	8,000	40,000	40,000	80,000
6	Stormwater Contributories / FX0200	S	***C***	***557***	557	557	557	557	2,785	2,785	5,570
	Stormwater Projects Subtotal			***25,071***	25,071	25,071	25,071	25,071	**125,355**	125,355	**250,710**
	OTHER NEIGHBORHOOD IMPROVEMENTS										
7	Developer Defaults / U00060	G, X	***C***	***700***	700	700	700	700	3,500	3,500	7,000
8	Payments of Interest on Conservation Bonds / 009998	G	***C***						0		0
9	Streetlights / Z00001	G	***C***						0		0
10	Minor Streetlight Upgrade / Z00016	G	***C***		20	20	20	20	80	100	180
11	Survey Control Network Monumentation / U00005	G	***C***	***75***	75	75	75	75	375	625	1,000
12	Emergency Directives / ED0001	G	***C***		100	100	100	100	400	500	900
13	Developer Streetlight Program/ Z00002	X	***C***	***1,000***	1,000	1,000	1,000	1,000	5,000	*5,000*	10,000
	Other Neighborhood Improvements Subtotal			***1,775***	1,895	1,895	1,895	1,895	9,355	9,725	19,080
	TOTAL		***$0***	***$26,846***	$26,966	$26,966	$26,966	$26,966	$134,710	$135,080	$269,790

Notes: Numbers in ***bold italics*** represent funded amounts. A "C" in the 'Budgeted or Expended' column denotes a continuing project.

Key: Stage of Development	
	Feasibility Study or Design
	Land Acquisition
	Construction

Key: Source of Funds	
B	Bonds
G	General Fund
F	Federal
X	Other
U	Undetermined
S	Special Service District
SR	Special Revenue