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

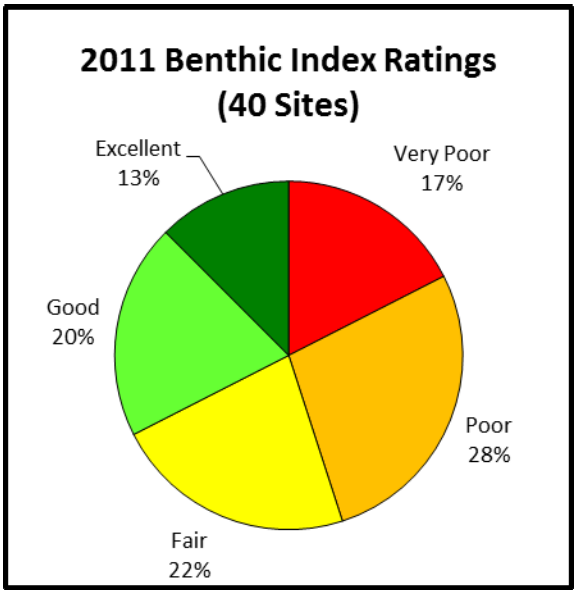
Stormwater Management Program

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.

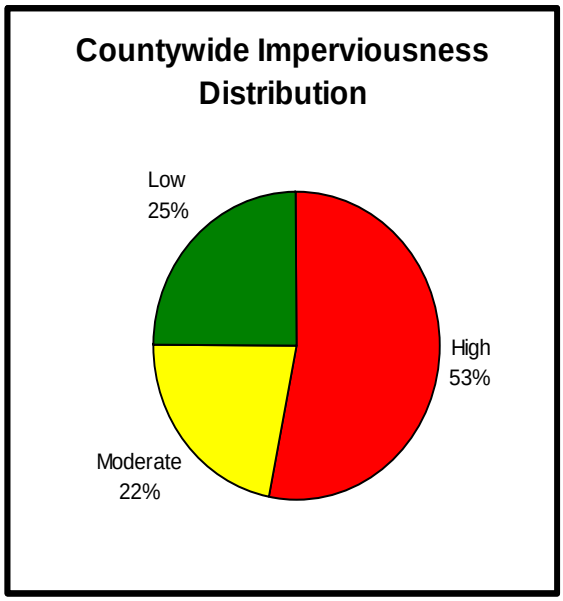
Watershed Planning and Implementation

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 2011 stream monitoring, almost 35 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 MS4 permit requirements, Virginia and other signature states to the Chesapeake Bay 2000 Agreement prepared "The Potomac River Tributary Strategies" in 2005 to set specific targets for reduction and capping of nutrients and sediment pollutants entering the Bay through its various tributaries and from both point source (e.g. wastewater treatment plants) and non-point source pollution. However, the Tributary Strategies are now replaced by the State's Watershed Improvement Plans (WIP) in response to requirements for a Chesapeake Bay-wide Total Maximum Daily Load (TMDL), established by the EPA in December 2010. The TMDL for the Chesapeake Bay has established 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 is well on the way and Bay states have already completed a Phase I WIP in November 2010 and have also developed a Phase II WIP which was submitted to EPA in March 2012. The WIPs involve increased measures tied to firmly established milestones with an interim

midpoint program assessment in 2017 and an ultimate implementation deadline of 2025. The County is in the process of developing a new stormwater management ordinance (chapter 124) to be adopted by the Board of Supervisors by July 2014 to implement the new Virginia Stormwater Regulations. Through the stormwater program and other efforts, the County is doing its part to increase water pollution control measures in order 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 anticipated reissuance of the next 5-year MS4 permit, the implementation of the Chesapeake Bay-wide TMDL, State's stormwater regulations 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 the County represents added funding requirements 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 continue to 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, funding will be needed to meet the recurring maintenance requirements.

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. A stormwater service rate of $0.15 per $100 of assessed real estate value had been in place since FY 2011. In FY 2013, the stormwater service rate increased $0.005 for a total of $0.020 per $100 of assessed real estate value. In FY 2014, the stormwater service rate will remain at $0.020 per $100 of assessed real estate value. The FY 2014 levy of $0.020 will generate $41.2 million, supporting $17.6 million for staff and operational costs, and $23.6 million for capital project implementation including, infrastructure reinvestment, regulatory requirements, dam safety, and contributory funding requirements.

Stormwater staff is currently evaluating the required future funding levels to meet the increasing federal and state regulatory requirements pertaining to the Municipal Separate Storm Sewer System (MS4) Permit, and State and Federal mandates associated with the Chesapeake Bay. In the next year, staff will develop a long term funding and staffing plan to be presented to the Board of Supervisors. It is anticipated that this long range plan will include a five-year rate plan, a phased approach for funding and staffing, and a public outreach plan to support the anticipated regulatory increases. The CIP assumes that the plan will include an increase of ½ penny on the Stormwater Service District rate through FY 2018.

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.

There are several projects related to streetlights in the County that may 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 24,000 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 Supervisors 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 24,000 MV streetlights. Further, the County will also need to replace an estimated 1,250 obsolete MV and HPS (52 fixtures) 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 24,000 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 within the stormwater system 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. A draft permit has been prepared for the County which indicates that significant enhancements to all facets of the program will be required. In addition to the requirements outlined in the draft permit conditions, a recent EPA audit of the County's program 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 better document the stormwater management facility inventory, enhance public out-reach and education efforts, increase water quality monitoring efforts, provide stormwater management and stormwater control training to all County employees, and thoroughly document all of these enhanced efforts. County staff are currently developing the procedures to implement these additional requirements.

2. **Emergency and Flood Response Program** (Countywide): This program supports flood control projects for unanticipated flooding events that impact storm systems and flood residential properties. The program will provide annual funding for scoping, design, and minor construction activities related to flood mitigation projects.

3. **Dam Safety and Facility Rehabilitation** (Countywide): This is a continuing project to rehabilitate dams throughout the County. The County currently has more than 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 maintains the control structures that include the dams that control and treat the water flowing through County owned facilities. This initiative 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. The 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 initiative 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 inspections of the pipes in FY 2006. The initial results showed that more than 5 percent of the pipes were in complete failure and an additional 15 percent of them required immediate repair. Increased MS4 permit regulations apply to these 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 they are additive and significantly increase inspection, reporting and management actions related to the infrastructure system. Acceptable industry standards indicate that one dollar re-invested in infrastructure saves seven dollars in the asset's 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 construction of stormwater management ponds, implementation of 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, completed an audit of the County's current Stormwater program in June 2011. The full impact of the audit findings has not been finalized. In addition, the Chesapeake Bay Total Maximum Daily Load (TMDL) requirements are the regulatory process by which pollutants entering impaired water bodies are reduced. The Chesapeake Bay TMDL was established by the EPA 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, retrofit existing facilities and properties, and increase maintenance. Preliminary estimates indicate that the projects needed to bring the County's stormwater system into compliance with the Bay TMDL could cost between $70 and $90 million per year. The Bay TMDL facility retrofit requirement is additive to the current design and construction efforts associated with 1,700 Watershed Plan projects and ongoing stream and flood mitigation projects.

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. **Flood Prevention (Huntington Area)** (Mt Vernon): $30,000,000 for storm drainage improvements to prevent flooding and soil erosion primarily to prevent flooding in the Huntington community. During the past 10 years, three floods have damaged homes, vehicles and other property in the Huntington neighborhood. In June 2006, 160 homes were flooded, and 160 homes were damaged in 2011 during Tropical Storm Lee. Today, there are 180 homes in the FEMA-designated floodplain that are at risk. Homes in the area were built in the 1940s and 50s before regulations were enacted that prevented them from being sited in floodplains. At Fairfax County's request, the U.S. Army Corps of Engineers studied the best ways to protect Huntington from future floods. The study examined a number of options, including dredging Cameron Run, buying the flood-prone properties and flood proofing individual homes. The study found that building a levee and a pumping station is the most cost-

effective way to reduce flooding in the neighborhood. Funds are planned to pay to complete the design and build a 2,800-foot-long levee and pumping station, along with buying any land needed for this purpose. While the levee can prevent flooding of houses from the types of storms that have happened in the past, it is not designed to offer protection from flooding that is caused by storms that are greater than a 100-year event. During major storms, street flooding may continue to occur in the Huntington area after the levee is built. It is expected to take three to five years to complete the design of the levee and obtain the required permits. Construction may take another two years. This project was approved as part of the fall 2012 Stormwater Bond Referendum.

8. **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.

9. **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.

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. Funding for this program varies from year to year.

13. **Developer Streetlight Program** (Countywide): This is a continuing program to support the installation of streetlights throughout the County. The County coordinates with Dominion Virginia Power and NOVEC 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 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	Total FY2014-FY2018	Total FY2019-FY2023	Total Project Estimate
	STORMWATER MANAGEMENT										
1	Stormwater Regulatory Program / 2G25-006-000	S	***C***	***5,000***	5,500	6,000	6,500	7,000	30,000	30,000	60,000
2	Emergency and Flood Response Projects / SD-000032	S	***C***	***900***	900	1,000	1,000	1,000	4,800	4,800	9,600
3	Dam Safety and Facility Rehabilitation / SD-000033	S	***C***	***4,029***	7,250	8,500	9,000	10,000	38,779	39,864	78,643
4	Conveyance System Rehabilitation / SD-000034	S	***C***	***4,500***	7,500	8,500	9,000	10,000	39,500	40,500	80,000
5	Sream and Water Quality Improvements / SD-000031	S	***C***	***8,616***	10,000	15,000	20,000	25,000	78,616	78,000	156,616
6	Stormwater Contributories / 2G25-007-000, 2G25-008-000	S	***C***	***573***	573	573	573	573	2,865	2,989	5,854
7	Flood Prevention (Huntington Area)	B	***375***	***850***	***850***	***5,000***	***5,000***	***5,000***	16,700	12,925	30,000
	Stormwater Projects Subtotal			***24,468***	32,573	44,573	51,073	58,573	211,260	209,078	420,338
	OTHER NEIGHBORHOOD IMPROVEMENTS										
8	Developer Defaults / 2G25-020-000	G, X	***C***	***700***	700	700	700	700	3,500		3,500
9	Payments of Interest on Conservation Bonds / 2G06-002-000	G	***C***						0		0
10	Minor Streetlight Upgrade / 2G25-026-000	G	***C***		20	20	20	20	80		80
11	Survey Network Controls / 2G25-026-000	G	***C***	***50***	75	75	75	75	350		350
12	Emergency Directives / 2G25-018-000	G	***C***		100	100	100	100	400	500	900
13	Developer Streetlight Program / 2G25-024-000	X	***C***	***500***	1,000	1,000	1,000	1,000	4,500		4,500
	Other Neighborhood Improvements Subtotal			***1,250***	1,895	1,895	1,895	1,895	8,830	500	9,330
	TOTAL		***$375***	***$25,718***	$34,468	$46,468	$52,968	$60,468	$220,090	$209,578	$430,043

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

	Feasibility Study or Design
	Land Acquisition
	Construction

B	Bonds
G	General Fund
F	Federal
X	Other
U	Undetermined
S	Special Service District
SR	Special Revenue