

SECTION 3

PROMOTING A SUSTAINABLE
COMMUNITY

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SECTION 3

3.1 Introduction

Section 2 of this report identified the broad policy framework guiding the county's sustainability initiatives. This section addresses how the county furthers the policy framework through promotion of sustainability within the community.

In its Environmental Vision (Environmental Agenda), adopted in 2004, revised in 2007, and planned for an update in 2017, the Board of Supervisors concluded that environmental stewardship is both a key responsibility and a critical legacy of any elected public body. As such, "the Board of Supervisors will have as one of its chief goals to integrate environmental planning and smart growth into all we do and to leave our land, water and air quality, better than we found it" The board's far-sighted goal is found on page 11 of the Environmental Agenda, available at www.fairfaxcounty.gov/living/environment/eip/bos_environmental_agenda.pdf.

Achieving this goal of sustainability requires an on-going commitment to support environmental stewardship in every aspect of daily life.

Fairfax County made this commitment to sustainability, demonstrated by an extensive range of policies, programs and efforts, including those promoting:

- Transit-oriented mixed-use development and green building practices.
- Clean air and reduced carbon emissions.
- Healthy waterways and clean drinking water.
- Adaptive, holistic management of natural resources.
- Tree canopy conservation, forest management and access to open space.
- Recycling and other waste management initiatives that minimize use of landfills.
- Outreach and educational programs that support stewardship values.
- Reduction of environmental hazards to human health and quality of life (e. g., biological, chemical and physical hazards, noise, light pollution and visual pollution).

3.2 Growth and Land Use

Both Fairfax County and the larger metropolitan Washington, D. C. area are expected to experience substantial growth into the future.

Fairfax County's 2015 population of approximately 1.13 million is projected to increase to over 1.26 million by 2030. Over this same period, the number of households is forecast to increase from about 404,000 to nearly 468,000. The Metropolitan Washington Council of Governments (COG) forecasts that the population in the region (i.e., jurisdictions within the COG/Transportation Planning Board Planning Area) will grow by over 1.5 million between 2015 and 2045, increasing from approximately 5.4 million to approximately 6.9 million. COG forecasts that between 2015 and 2045 the region will add over 1.1 million jobs, with over 240,000 of these new jobs located in Fairfax County.

The question, then, is not if the county will grow, but how it will grow.

The county's growth and land use policies favor growth in mixed-use, transit-oriented centers. These centers provide for employment growth near both transit opportunities and residential areas. They also support vibrant communities by creating safe and attractive streets for pedestrians and reducing the need for vehicle trips and resulting traffic congestion.

3.2.1 Zoning and Planning

Land use in Fairfax County is regulated by the Zoning Ordinance. Each parcel of land in the county is zoned, and the zoning establishes both rights and restrictions on the use and development of that parcel. These restrictions include allowed uses and standards, including setback, building height, open space and parking requirements. Additional requirements exist in "overlay" districts that have been established to address area-specific issues, such as water quality within the Occoquan Reservoir watershed.

Development that conforms to allowed uses and standards under the zoning ordinance proceeds "by right" – that is, it is approved administratively and does not require a public hearing. Legislative approval following public hearing is required for other development:

- Requests for special permit uses are subject to approval by the Board of Zoning Appeals.
- Requests for special exceptions or to change the zoning of a parcel (rezoning) are subject to approval by the Board of Supervisors.

The Fairfax County Planning Commission holds public hearings and provides recommendations to the Board of Supervisors on all special exception and rezoning proposals.

In making decisions on these matters, members of the boards and Planning Commission are guided by the Comprehensive Plan. This plan, which is discussed in Section 2.2.5, describes the county's land use vision for the future and includes countywide and area-specific policies to help attain this vision.

More information about the Zoning Ordinance and process is available at www.fairfaxcounty.gov/dpz/zoning/. The Comprehensive Plan is available at www.fairfaxcounty.gov/dpz/comprehensiveplan/.

3.2.2 Transit-Oriented Mixed-Use Development

The Policy Plan volume of the county's Comprehensive Plan contains the Board of Supervisors' goals, policies and objectives regarding land use, transportation, housing, the environment, human services, public facilities, parks and recreation, revitalization, economic development, heritage resources and visual and performing arts.

The land use and transportation policies of the Comprehensive Plan emphasize locating mixed uses, including employment and multifamily housing, in activity centers (i.e., the Tysons Corner Urban Center, suburban centers, community business centers and transit station areas) with transportation options, especially rail transit. Transit-oriented mixed-use development (TOD) guidelines were incorporated into the Policy Plan in March 2007.

In June 2010, the Board of Supervisors adopted an amendment to the Comprehensive Plan for the Tysons area. The Plan amendment, which was the culmination of one of the largest targeted planning efforts in county history, supports TOD concepts, including the provision of housing in employment centers. This amendment, which was designed to take advantage of the four new Metro stations to be built in the area, received the 2011 Daniel Burnham Award from the American Planning Association. This award is granted to only one urban plan in the nation each year for advancing the science and art of planning.

Other Plan amendments that support TOD concepts and/or mixed use development and connectivity include those for Annandale, Baileys Crossroads, Seven Corners, Franconia-Springfield, Lake Anne Village Center, the Fairfax Center Area, areas near Fort Belvoir and areas near future rail stations in the Reston and Herndon areas. It is anticipated that efforts to incorporate TOD, mixed use and connectivity concepts into the Comprehensive Plan will continue into the future.

The Plan's guidance is implemented through the approval of zoning applications. Approved and pending rezoning applications regarding TOD and mixed use development include those affecting properties in Tysons, Reston, the Dulles Suburban Center, Merrifield, Springfield and the Huntington and Vienna Metrorail station areas.

The Policy Plan is available at www.fairfaxcounty.gov/dpz/comprehensiveplan/policyplan/. More information about TOD is available in the Land Use section of the Comprehensive Plan, available at www.fairfaxcounty.gov/dpz/comprehensiveplan/policyplan/landuse.pdf, particularly Objectives 2, 6, 16 and Appendix 11.



Mosaic District

3.2.3 Revitalization

Fairfax County's Office of Community Revitalization (OCR) facilitates strategic redevelopment and investment opportunities within the older and transforming commercial activity

centers of the county. These centers include the five Commercial Revitalization Districts (CRD) of Annandale, Baileys Crossroads/Seven Corners, McLean, Richmond Highway and Springfield; the two Commercial Revitalization Areas (CRA) of Lake Anne Village Center and Merrifield; the Springfield Town Center; Reston Transit Station Areas (TSA) and village centers; and the Tysons Urban Center (Tysons).

OCR includes a dedicated team of planning and design professionals who work with developers, property owners, community stakeholders, cross-agency teams and consultants to provide review and direction on zoning applications, site plans, Comprehensive Plan amendments, streetscape and wayfinding projects, infrastructure improvement projects, public outreach, special studies, urban design guidelines, solicitations regarding county facilities and related development and public-private partnerships.

Board policy and OCR's work program have been instrumental in promoting a sustainable community through redevelopment and reinvestment. New incentives to reduce barriers for redevelopment and facilitate revitalization and redevelopment are being implemented through countywide initiatives aimed at improving the development process. To achieve and sustain revitalization goals and objectives, the county

has adopted Plan guidance for each CRD/CRA, Tysons and Reston; incorporated the Urban Parks Framework into the Policy Plan; and adopted Urban Design Guidelines for many of its mixed-use activity centers, with the goal of adopting such standards for additional areas. These guidelines promote walkable, pedestrian-oriented, sustainable development and are used to evaluate development applications and site plans.

Through the use of strategic financing mechanisms, such as the Community Development Authority/Tax Increment Financing (CDA/TIF) that was used for the Mosaic-Merrifield Town Center project, and other forms of public-private partnerships, the county forms partnerships with the private sector to complete major projects that serve the public interest.

More information about revitalization is available at www.fcrevit.org.

3.2.4 Green Buildings

Green Building Policy – In addition to adopting a green building policy that applies to county capital projects, as discussed in Section 4.2.1, Fairfax County has adopted green building policies for private sector development. These policies for private sector development are found in the Comprehensive Plan and are implemented through the zoning process.

The Policy Plan volume of the Comprehensive Plan includes broad support for green building practices. It also establishes links between green building/energy conservation practices and the attainment of certain Comprehensive Plan options and planned uses, as well as development densities and intensities. One example of these linkages involves proposals at the high end of the planned density/intensity range in the county's growth centers. In these centers, green building certification



Dolley Madison Library

through the Leadership in Energy and Environmental Design (LEED®) program or its equivalent is recommended for certain nonresidential and multi-family residential proposals. Another example that applies countywide is the recommendation for other residential projects to incorporate green building practices sufficient to attain certification under an established residential green building rating system that incorporates multiple green building concepts and that includes an ENERGY STAR® Qualified Homes designation or comparable level of energy performance.

The Area Plan volumes of the Comprehensive Plan include area-specific green building policy. For example, the Tysons Corner Urban Center Area Plan recommends a LEED Silver or equivalent level of certification for nonresidential development. Plan guidance recommends similar efforts for specific areas within the Richmond Highway Corridor, an area near the Town of Herndon, Reston's Transit Station Areas and areas near the Huntington and Franconia-Springfield Metrorail stations. Another example of an area-specific policy is found in the Annandale Community Business Center Plan. This Plan includes an incentive development option that allows for increased building heights in certain areas where any of a number of benefits are provided, including commitments to LEED Gold or LEED Platinum certification.

During the zoning application review process, county staff receives commitments from applicants to green building certification and other green building efforts. Commitments to green building certification have been made for more than 200 buildings that have been approved through the zoning process. A majority are linked to LEED certification, with many buildings linked to certification at the LEED Silver or higher level.

More information about the county's green building policies for private sector development is available at www.fairfaxcounty.gov/dpz/comprehensiveplan/policyplan/environment.pdf (Objective 13).

Green Building Priority Plan Review – Both residential and commercial development projects that will be designed to attain certain thresholds of green building design are eligible for shorter waiting times during the building plan review process. Commercial projects designed to reach a minimum LEED rating of silver are eligible for this incentive, as are residential projects designed to, as a minimum, attain one of the following rating levels: LEED for Homes Silver; National Green Building Standards™ Silver; Earthcraft™ Select; or three “Globes” in the Green Globes™ rating system. Other green building rating programs are evaluated for approval on a case-by-case basis.

County Incentives for Solar Installations – Current solar incentives include a waiver for the permit application fee (solar hot water or solar photovoltaic projects) and a limited solar tax incentive in accordance with Va. Code Section 58.1-3661. This is covered by the county ordinance in Article 18, Chapter 4 of the Fairfax County Code. Essentially, qualifying solar equipment as approved by the Department of Public Works and Environmental Services (DPWES) can result in a tax credit (not an exemption) against the amount of normal property taxes due. The credit is determined by applying the local tax rate to the value of the certified solar equipment (the value is typically the cost of the equipment).

The tax credit is available the first tax year following the date of application. The credit is good for five years. Although the concept for this was generally aimed at homes, both commercial and residential properties qualify. The link provided is the application from DPWES at www.fairfaxcounty.gov/dpwes/forms/solarenergy.pdf.

In addition, it is possible to obtain a same-day solar permit if proper documentation is provided to the walk-through counter at the county's Permit Application Center.

3.3 Air Quality and Transportation

The federal Clean Air Act was passed in 1970 to protect public health and welfare. Congress amended the Act in 1990 to establish requirements for areas not meeting the National Ambient Air Quality Standards (NAAQS) for ground-level ozone (smog), oxides of nitrogen (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), lead and particulate matter (PM). The metropolitan Washington region is a “Marginal” nonattainment area for the 2008 eight-hour standard for ground level ozone. The region is in compliance with the NAAQS for the other five criteria pollutants.

The Clean Air Act Amendments of 1990 (CAAA) established a legal process for evaluating air quality and identifying and classifying nonattainment areas according to the severity of their air pollution problems. Although emissions from stationary sources such as industrial power generation facilities and manufacturing are significant contributors to overall air quality, the focus of this section will be on transportation related (mobile) emissions.

Since 1970, significant progress has been made in reducing mobile source emissions in the Washington Metropolitan region, despite increases in

population, employment and vehicle miles traveled. Most of the emissions reductions have resulted from cleaner vehicles and cleaner fuels.

Transportation agencies, both state and local, have also contributed to emission reductions through the implementation of transportation system management (TSM) strategies such as traffic signalization projects and high occupancy vehicle lanes, and through transportation demand management (TDM) strategies such as transit facilities and pedestrian and bicycle programs. Nevertheless, mobile sources continue to contribute to overall air quality issues and remain an area of concern to regulatory agencies and to the general public. More recently, mobile source air toxics and greenhouse gas emissions have also become concerns.

3.3.1 Air Quality Planning in the Washington Metropolitan Region

Under Section 174 of the CAAA, the governors of Maryland and Virginia and the mayor of the District of Columbia certified the Metropolitan Washington Air Quality Committee (MWAQC) to develop specific recommendations for a regional air quality plan in the Washington, DC-MD-VA nonattainment area.

Members of MWAQC include: elected officials from the Cities of Bowie, College Park, Frederick, Gaithersburg, Greenbelt, Rockville and Takoma Park in Maryland and Alexandria, Fairfax, Falls Church, Manassas and Manassas Park in Virginia; representatives of the Montgomery and Prince George's county councils; the Montgomery and Prince George's county executives; the mayor of the District of Columbia and representatives of the Council of the District of Columbia; and representatives of Calvert, Charles and Frederick counties in Maryland, and Arlington, Fairfax, Loudoun and Prince William counties in Virginia. Representatives of the general assemblies of Maryland and Virginia, the state air management directors, the state transportation directors and the chairman of the National Capital Region Transportation Planning Board also are members of MWAQC.

The Metropolitan Washington Council of Governments (COG), in close cooperation with state air quality and transportation agencies, provides technical support to MWAQC. Staffs from the local counties and cities provide additional technical support.

MWAQC also has established an Air Quality Public Advisory Committee (AQPAC) to provide recommendations regarding public participation in the development of the air quality plans. AQPAC members represent academic, business, civic and environmental groups.

In addition, MWAQC works with the Interstate Air Quality Council (IAQC), a cabinet-level collaboration among the District of Columbia, the state of Maryland and the commonwealth of Virginia that includes the secretaries of the environment and transportation. The purpose of the IAQC is to address issues of interstate transport of air pollutants and to provide a sound process for improving regional air quality.

Once MWAQC approves the air quality attainment plan, it will be forwarded to the Interstate Air Quality Council for approval. The governors and the mayor (or their designees) are then required to submit the air quality State Implementation Plans (SIPs) to the U.S. Environmental Protection Agency (EPA) to meet the requirements of the CAAA.

3.3.2 Transportation Planning in the Washington Metropolitan Region

Transportation planning in the Washington metropolitan region is heavily influenced by air quality planning. Transportation plans are tested to ensure that the projects in the plan, when considered collectively, contribute to the air quality improvement goals embodied in the CAAA. A series of tests are performed with computer models that predict how much air pollution will be generated over the next 25 years by facilities in the plan, and how much the air will be improved by cleaner gasoline standards and many other factors.

If the transportation plan is found to meet regional air quality goals, federal agencies certify that the plan is “in conformity.” In other words, the plan “conforms” to air quality improvement goals. If the plan encounters difficulty in meeting conformity, transportation agencies may be required to adopt Transportation Emission Reduction Measures, such as ridesharing and telecommuting programs, improved transit and bicycling facilities, clean fuel vehicle programs or other possible actions.

The transportation conformity rule and the Clean Air Act require that Transportation Control Measures (TCMs) in approved SIPs be implemented.

State air, environmental and health agencies are typically responsible for the development of SIPs that explain how each nonattainment area will meet the requirements of the CAAA. However, state and local transportation agencies are required to implement the transportation measures, so it is important that they take an active role in the development of the SIP.

3.3.3 Washington Metropolitan Air Quality Status

The metropolitan Washington region has met National Ambient Air Quality Standards, often referred to as NAAQS, for carbon monoxide and fine particulate matter, but not for ozone pollution.

Ozone – In July 2012, the Washington region was designated as a “Marginal” nonattainment area for the 2008 ozone standard of 75 ppb. The region was to have attained the 2008 standard by July 20, 2015 using 2012-2014 data. Based on the data for 2012-2014, the ozone design value for the Washington region was 76 ppb, so the region did not attain the NAAQS. However, the region has been progressively lowering the ozone level in the region, so state air agencies of the District of Columbia, Maryland, and Virginia requested EPA to extend the attainment date by one year. EPA granted the request in April 2016. The preliminary design value of 70 ppb for 2013-2015 shows that the region now is in attainment of the 75 ppb standard. Therefore, the Washington region plans to submit a redesignation request and a maintenance plan for the above standard by late 2017 or early 2018.

EPA published a revised eight-hour ozone standard of 70 ppb in October 2015. EPA is scheduled to publish by October 2017 designations regarding whether or not regions have attained the new standard based on 2014-2016 data. Depending on the designation for the metropolitan Washington region, federal, state and local governments may be required to implement new measures to meet the revised tougher standard.

Fine Particulate Matter (PM_{2.5}) – The region is in attainment of the 1997 primary annual PM_{2.5} standard. Based on the 2012-2014 data, the Washington region’s design values for the annual PM_{2.5} standard (12 µg/m³) is 9.5 µg/m³ and the daily PM_{2.5} standard (35 µg/m³) is 22 µg/m³. Also, there was no exceedance of the daily PM_{2.5} standard in 2015.

However, the region is covered under a maintenance plan for the 1997 primary annual PM_{2.5} NAAQS. This plan must demonstrate that the region will continue to meet the standard. Virginia, Maryland and the District of Columbia are revising the maintenance plan in 2016 to reflect revised annual motor vehicle emissions budgets (MVEBs) for PM_{2.5} and NO_x using the EPA approved MOVES2014 model. EPA had earlier approved the region’s MVEBs for the two pollutants which were developed using EPA’s older MOVES2010a model. The revised MVEBs will reflect the lower emissions calculated by the new model.

Carbon Monoxide – The region has been in attainment of the carbon monoxide NAAQS for the twenty year period of its maintenance plan and is projected to remain considerably under the NAAQS into the future. Therefore, there are now fewer requirements to assess the effects of transportation projects and other development on carbon monoxide emissions.

3.3.4 Fairfax County Transportation Initiatives

The Fairfax County Department of Transportation (FCDOT) has a number of initiatives supporting transit and other forms of alternative transportation use in Fairfax County. The Employer Services Program provides



McLean Metro Station

outreach to employers on

transportation demand management strategies, including rideshare incentives and promotions, computerized ridematching, carpool incentives such as preferred parking, subsidies and telework programs.

In recent years, FCDOT's Bicycle Program has made great improvements to bicycle infrastructure and opportunities for county residents. The Bicycle Master Plan was approved by the Board of Supervisors in October 2014. Since then, FCDOT has partnered with the Virginia Department of Transportation (VDOT) to install over 30 miles of on-road facilities. The adoption of the Bicycle Master Plan, coupled with the VDOT partnership, resulted in 2015 being the most successful year for bike facility implementation in Fairfax County to date.

In early 2016, the Board of Supervisors approved a \$1.7 million plan to launch the Capital Bikeshare system in Reston and Tysons. The plan will bring 15 Capital Bikeshare stations and 132 bicycles to Reston, and 11 Capital Bikeshare stations and 80 bicycles to Tysons. The first phase of the system is anticipated to launch in fall 2016, and FCDOT will continue to evaluate potential areas to expand the system in the future.

Other FCDOT efforts include: the Connector Bus system; the "RideSources" program, which provides ridesharing information and ridematching assistance to commuters (part of the regional Commuter Connections system); the Community Residential Program, which assists residential communities with the assessment and promotion of alternatives to single occupant vehicle trips; and the provision of Park-and-Ride lots.

Employees are eligible to receive a subsidy for transit use of up to \$120 per county employee. More information is available at www.fairfaxcounty.gov/fcdot/.



Fairfax Connector Bus

3.4 Water Resources

The Federal Water Pollution Control Act of 1948 was enacted as the first law to address water pollution. Increased awareness and concern of water pollution in the following years throughout the U.S. led to amendments to the law in 1972, which became known as the Clean Water Act (CWA).

The Clean Water Act requires states and their municipalities to meet certain water quality standards for all contaminants in surface waters. The act established: authority for EPA to implement pollution control programs (with delegation to the states); a basic structure for regulating pollutant discharges (through construction, industrial, wastewater and municipal separate storm sewer systems or MS4 permits); water quality standards for surface waters (including impaired waters and total maximum daily loads); and the need to address critical issues in the Chesapeake Bay.

Additionally, in 1974 Congress passed the Safe Drinking Water Act, which regulates public drinking water supplies through national health-based standards for drinking water from every day water systems. The law has been amended twice and requires actions to be taken to protect drinking water and its sources.

Since the passage of the Clean Water Act and the Safe Drinking Water Act, federal and state agencies have had great success in controlling pollution from point sources (industrial and wastewater discharges) and protecting public water supplies. In more recent years, continued efforts to improve the water quality of rivers, estuaries and lakes have led to an increased focus on addressing nonpoint source pollution such as agricultural and urban stormwater runoff.

3.4.1 Stormwater

Fairfax County has made significant investments in addressing stormwater management and controlling water pollutants. Stormwater is the runoff from rainfall and snowmelt that flows across the land and impervious areas such as paved streets, parking lots and building rooftops. Stormwater runoff can pick up and carry sediments, nutrients, toxic substances, pathogens and other pollutants to lakes, streams, rivers, wetlands and coastal waters. These pollutants have the potential to impact drinking water supplies, recreation and aquatic life. In addition, impervious surfaces prevent water from infiltrating the ground, causing higher volumes of stormwater runoff to flow into storm drains at higher speeds. When these higher volumes of stormwater runoff empty into receiving streams, they can severely erode stream banks and damage sensitive stream valley ecosystems. The county is proactive in the mission of environmentally friendly stormwater management and control through implementation of a broad range of ongoing activities. For more information on stormwater management funding to protect streams and rivers, see Section 2.4, Strategic Framework: Funding Mechanisms.



*Big Rocky Run Stream
Restoration Before and After*

Watershed Management Planning – The Board of Supervisors has adopted watershed management plans covering all 30 of the county’s watersheds. Each plan provides an assessment of stormwater conditions, recommends protection strategies, prioritizes improvement projects and encourages

public involvement in project selection and implementation. The watershed management plans and recommended improvement projects can be found online at: www.fairfaxcounty.gov/dpwes/watersheds/.



Stormwater Capital Projects – Fairfax County and its partners continue to implement stormwater management-related capital projects, including flood mitigation projects, stormwater management facility retrofits, green infrastructure (previously known as low impact development [LID] projects), stream restoration, meadow installation and stabilization projects.



Pond Retrofit Before and After

Operations – Fairfax County maintains and operates its stormwater management facilities and stormwater drainage infrastructure

consistent with the requirements of its Municipal Separate Storm Sewer System (MS4) permit, which regulates discharges of stormwater from the county's MS4. In an effort to minimize the pollutants reaching the MS4 and streams, the county also implements best management practices as required by the permit for: operation of county maintained roadways; use of pesticides, herbicides and fertilizers on county properties; controlling industrial and high risk runoff; detection and elimination of sources of illicit discharges; and spill response.

Monitoring and Assessment – Fairfax County conducts in-stream water quality monitoring, dry weather screening, wet weather screening, physical habitat evaluations and biological assessment of fish and aquatic macroinvertebrates.

Public Outreach and Education – Fairfax County continues to partner with local organizations to implement programs informing residents of water quality issues and encouraging environmental stewardship.

Strategic Initiatives – Fairfax County and its partners work proactively to improve the county’s stormwater management through the MS4 permit and TMDL compliance, workplace modernizations, watershed management plans structural projects and updating job hazard assessments.

Stormwater Management Status Reports are available at www.fairfaxcounty.gov/dpwes/stormwater/stormwater_status.htm.

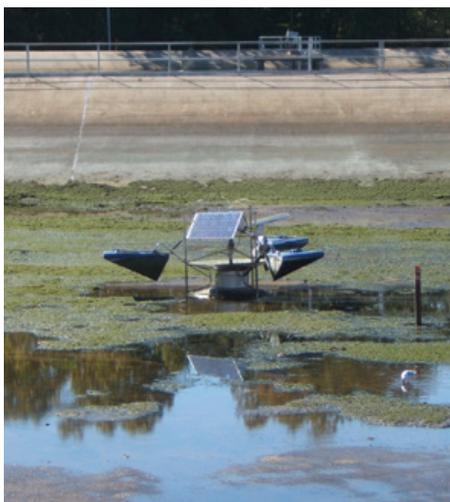
3.4.2 Wastewater

Fairfax County’s Wastewater Management Program provides wholesale sewer service to the Towns of Herndon and Vienna, the Cities of Fairfax and Falls Church, and a small portion of Arlington County in addition to Fairfax County. The county’s wastewater system has been featured on United States Environmental Protection Agency’s website for innovative use of Capacity, Management, Operation and Maintenance (CMOM) techniques as well as system rehabilitation and diagnostic methods for minimizing sanitary sewer overflows, which in turn protect the quality of life in Fairfax County and water quality in its streams. See www.epa.gov/npdes/pubs/sso_casestudy_fairfax.pdf.

Wastewater Capital Projects – a majority of the recent capital projects have been related to upgrading the wastewater treatment plants that serve the county to meet the more stringent federal and state requirements for improving the water quality in the Potomac River and the Chesapeake Bay. The completed plant upgrades have resulted in nitrogen discharge levels that are consistently below permitted limits.

Operations – The county’s wastewater system consists of approximately 3,400 miles of sewer lines, 63 sewage pumping stations, 280 sewage grinder pumps and 53 flow metering stations.

Currently, the approximately 100 million gallons per day (MGD) of wastewater generated and collected in Fairfax County is conveyed and treated at the county-owned and operated Noman M. Cole, Jr. Pollution Control Plant, at five regional treatment facilities (Prince William County Service Authority, DC Water Blue Plains plant, Alexandria



Solar mixer at Noman M. Cole, Jr. Pollution Control Plant

Renew, Arlington County, Upper Occoquan Service Authority), and at a privately owned (Colchester) plant through sewer service agreements and in accordance with their Virginia Pollutant Discharge Elimination System permits. Additionally, 1 MGD capacity at Loudoun’s Broad Run plant has been purchased in anticipation of future growth in the northern part of the county. The treatment plants serving the county under service agreements are listed below, showing the county’s allocated capacity at each of the plants:

Plant	County Capacity (MGD)
Noman M. Cole, Jr.	67.00
Colchester (Private)	0.08
Prince William County Service Authority.....	0.10
Blue Plains (DC Water)	31.00
Alexandria (AlexRenew)	32.40
Arlington County	3.00
Upper Occoquan Service Authority	22.60
Loudoun County (Broad Run)	1.00
TOTAL	157.18

Public Outreach – Wastewater Management employees bring Sewer Science to the county’s high schools. The Sewer Science program, which meets the requirements of Virginia Standards of Learning, is a hands-on program that teaches high school students about wastewater treatment in a laboratory setting. See www.fairfaxcounty.gov/dpwes/wastewater/sewerscience.htm.

Rigorous and Sustainable Analytical Services – Value-added and reliable laboratory capacity is a critical function for defining environmental quality. Wastewater Management maintains an advance analytical capability that is certified under Virginia Environmental Laboratory Accreditation Program to accurately and confidently assess the environmental effects of its programs and ensure regulatory compliance. Wastewater Management is also pursuing more sustainable laboratory practices through upgrading or adding new, more energy efficient analytical instrumentation, which uses less toxic/hazardous reagents as well as minimizes sample and reagent waste, and reduces chemical emissions to ensure more consistent use of green chemistry principles.

Wastewater Reuse – In addition to wastewater reuse at the waste-to-energy facility described in Section 3.7.2, fully treated wastewater is being delivered to the Laurel Hill Golf Course and the South County Little League Athletic Fields for irrigation purposes. In addition, the Upper Occoquan Service Authority (UOSA) discharge supplements flows into the Occoquan

Reservoir and is an internationally recognized example of successful indirect reuse.

Virginia Environmental Excellence Program – The Virginia Department of Environmental Quality has established the Virginia Environmental Excellence Program to encourage superior environmental performance by use of environmental management systems and pollution prevention. Wastewater Management has received the highest level of the Environmental Excellence Program, which is “Extraordinary Environmental Enterprise,” or E4.

3.4.3 Water Supply Planning

Virginia experienced serious droughts in 1999 and 2002. Largely as a result of these droughts, in November 2005 the State Water Control Board (SWCB), a regulatory board comprised of citizen-appointees, enacted regulations establishing the requirement and criteria for a planning process for all local governments to develop local or regional water supply plans. The purposes of these regulations, codified at 9 VAC 25-780, Local and Regional Water Supply Planning, are to: (1) ensure that adequate and safe drinking water is available to all citizens of the commonwealth; (2) encourage, promote and protect all other beneficial uses of the commonwealth’s water resources; and (3) encourage, promote and develop incentives for alternative water sources, including but not limited to desalinization. Localities were required to submit their Water Supply Plans (WSPs) by November 2011 to the Virginia Department of Environmental Quality (DEQ), which administers regulations enacted by the SWCB.

Fairfax County has participated in the development of a regional water supply plan (WSP) encompassing 22 Northern Virginia jurisdictions. In 2007, these jurisdictions designated the Northern Virginia Regional Commission (NVRC) as the lead agency responsible for developing the initial Northern Virginia WSP. Fairfax Water (www.fairfaxwater.org), which provides water service to nearly two million people in the Northern Virginia counties of Fairfax, Loudoun and Prince William, the cities of Fairfax, Falls Church and Alexandria and the Towns of Vienna and Herndon, served as the county’s designated agent in the WSP development process.

The Northern Virginia WSP includes numerous elements, including: descriptions of existing water uses, sources and resource conditions; an assessment of projected water demand; water management actions that address water conservation; and an evaluation of alternative water sources to address projected deficits in water supplies.

The SWCB also conducts a five-year review to assess the adequacy of a WSP to meet water demands. A revised WSP must be submitted within five years if the circumstances have changed significantly or new information renders a WSP inadequate. The Northern Virginia WSP five-year review process is due in December 2018. WSPs must be reviewed, revised if necessary and resubmitted to DEQ every ten years from the date of last approval (December 2013).

The planning horizon for Northern Virginia's WSP extends to the year 2040. The WSP assessment indicates that new sources of supply are needed in the 2035-2040 timeframe in order to avoid emergency restrictions and potential water shortages.

Fairfax Water has planned proactively to meet future water supply demands. In June 2015, the Fairfax County Board of Supervisors and Fairfax County Board of Zoning Appeals approved a series of zoning applications from Fairfax Water and Vulcan Construction Materials that will provide for a two-phase conversion of a quarry into a water supply storage facility; this effort has been designed to address the need for new water supply sources in the 2035-2040 timeframe and ultimately into the next century.

The county also has adopted regulations restricting water use during drought and emergencies. These regulations, located in Chapter 113 (Water Use, Emergency Regulations) of the County Code, satisfy state requirements for drought response and contingency plans.

More information regarding the Northern Virginia WSP is available at www.novaregion.org/index.aspx?nid=1214.

3.5 Parks and Ecological Resource Management

3.5.1 Open Space in Fairfax County

Fairfax County contains approximately 50,800 acres of open space owned by local, state and federal agencies and organizations. (This number does not include unknown but substantial acreage under special tax district, rural or low-density residential areas or lands owned by civic associations within subdivisions.)

Almost half of the open space in the county – over 23,000 acres – is owned by the Fairfax County Park Authority (FCPA). The Board of Supervisors created FCPA in December 1950 and authorized it to make



Burke Lake Park

decisions concerning land acquisition, park development and operations in the county. Today, FCPA manages and operates over 420 parks. In addition to its role in providing recreational facilities and services, FCPA is the primary public mechanism for preserving environmentally-sensitive land and resources and areas of historic significance in Fairfax County. More information about FCPA is available at www.fairfaxcounty.gov/parks/.

Listed below are other owners of substantial open space in the county, including state and federal agencies and organizations.

Northern Virginia Regional Park Authority/NOVA Parks (NVRPA) – NVRPA was established in 1959 to protect natural resources from the threat of urban sprawl and provide recreational amenities. NOVA Parks owns about 8,270 acres in Fairfax County, primarily along the Bull Run-Occoquan river corridor and reservoir, the Potomac River and on Pohick Bay on Mason Neck. See www.nvrpa.org.

Reston Association (RA) – Founded as Virginia’s first planned residential community in the mid-1960s, RA owns over 1,350 acres of open space. Its holdings include 55 miles of paved and natural surface trails, more than 700 acres of forest, 50 meadows and numerous water resources including four lakes and 20 miles of stream. See www.reston.org.

U.S. Department of Defense – Fort Belvoir is a strategic sustaining base for the U.S. Army that houses numerous agencies providing logistical, intelligence and administrative support. The county considers about 4,990 of Fort Belvoir’s 8,500 acres to be open space. See www.belvoir.army.mil/default.asp.

U.S. Department of Interior, Bureau of Land Management (BLM) – In October 2001, BLM exchanged a portion of the former Lorton Prison

property to acquire the 800-acre Meadowood Special Recreation Management Area. The acquisition was intended to preserve open space on Mason Neck and provide wildlife habitat, recreation and environmental education. See www.blm.gov/es/st/en/fo/lpfo_html/meadowood_history.html.

U.S. Department of the Interior, Fish and Wildlife Service – The 2,277-acre Elizabeth Hartwell Mason Neck National Wildlife Refuge, located on Mason Neck, is the oldest and largest refuge within the Potomac River refuge complex. Established in 1969 under the Endangered Species Act, its focus is on forest, marsh and riverine habitat important to the bald eagle. See www.fws.gov/refuge/mason_neck.

U.S. Department of the Interior, National Park Service – George Washington Memorial Parkway is a 7,600-acre national park protecting the landscape, historic sites and native habitat of the Potomac shoreline. See www.nps.gov/gwmp/index.htm.

Virginia Department of Conservation and Recreation – Mason Neck State Park is comprised of 1,825 acres within the Elizabeth Hartwell Mason Neck National Wildlife Refuge that include wetlands, forest, open water, ponds and open fields. See www.dcr.virginia.gov/state-parks/mason-neck.shtml.

Additionally, certain organizations work to preserve open space through the negotiation and acquisition of conservation easements. A conservation easement typically restricts an owner's rights to subdivide or develop his/her property, to remove trees or to excavate or fill the property. One such organization active in Fairfax County is the Northern Virginia Conservation Trust (NVCT). NVCT, which was founded in 1994, helps local governments and private landowners voluntarily preserve natural areas, trails, streams and parks. NVCT has helped preserve 739 acres in Fairfax County. See www.nvct.org.



*Huntley Meadows Park
Red-eared Slider*

3.5.2 Natural Resource Management

Until a few decades ago, land management consisted of benign neglect, with areas left alone under the assumption that they were self-sustaining. Land management professionals now understand that there are tremendous pressures on remaining natural areas, that their conditions are declining and that active management is necessary to restore their health.

Today, natural resources are considered natural capital. This capital consists of various elements: living organisms; non-living components such as air, water and soil; the ecosystems they form; and the environmental services they provide, including cleaning air and water, supporting wildlife and contributing to the quality of life. Natural capital is not self-sustaining; instead, deliberate care and investment are required to enhance, protect and preserve it.

Agencies that manage resources in Fairfax County include FCPA, Urban Forest Management, the Stormwater Division of the Department of Public Works and Environmental Services, the Police Department and the Northern Virginia Soil and Water Conservation District. Additionally, the county has engaged many partners, including nonprofit organizations such as the Audubon Society of Northern Virginia, Earth Sangha, Fairfax ReLeaf, the Fairfax Chapter of Virginia Master Naturalists and organized Friends Groups.

Examples of the county's natural resource/capital management programs include:

- Fairfax County Watershed Planning and Watershed Plan Implementation (www.fairfaxcounty.gov/dpwes/watersheds/).

- Fairfax County Park Authority Natural Resource Management Plan Implementation (www.fairfaxcounty.gov/parks/resource-management/nrmp.htm).
- Fairfax County Deer Management Program (www.fairfaxcounty.gov/living/wildlife/deer-management/).
- Fairfax County Goose Management (www.fairfaxcounty.gov/living/wildlife/management/geese-management.htm).



Difficult Run

3.5.3 Policy and Regulatory Mechanisms for Protecting Natural Resources

Section 2 describes the regulatory, policy and strategic framework of the county's environmental programs, including a brief introduction to the county's Comprehensive Plan and environmental ordinances. Section 3.5.3 discusses three county regulations that play a key role in the protection of natural resources: the Chesapeake Bay Preservation Ordinance, the Floodplain Regulations of the county's Zoning Ordinance and the

Wetlands Zoning Ordinance. Also discussed is the Environmental Quality Corridor policy in the Comprehensive Plan, which plays a significant role in protecting natural resources.

3.5.3.A Chesapeake Bay Preservation Ordinance

All of Fairfax County drains into the Potomac River and ultimately the Chesapeake Bay. As a result, land use and development activities in the county can adversely impact the water quality of both the county streams and downstream resources.

In 1988, the Commonwealth of Virginia enacted the Chesapeake Bay Preservation Act, which required 84 localities in Virginia, including Fairfax County, to institute water quality protection measures to improve the declining health of the Chesapeake Bay and its tributaries. The county adopted the Chesapeake Bay Preservation Ordinance in 1993 to protect both local streams and the Chesapeake Bay from pollution due to land use and development in the county. The ordinance was substantially revised in 2003.

The Chesapeake Bay Preservation Ordinance imposes water quality requirements on all development and redevelopment projects in the county.

Sensitive areas along streams, rivers and other waterways throughout the county are designated as Resource Protection Areas (RPAs). With some exemptions and exceptions, land disturbance in RPAs is prohibited. Other areas of the county that are not in RPAs have been designated as Resource Management Areas (RMAs). RMAs are comprised of lands that, if improperly used or developed, have the potential to significantly harm water quality or diminish the functional value of the RPA. Collectively, RPAs and RMAs are known as Chesapeake Bay Preservation Areas.

More information about the Chesapeake Bay Preservation Ordinance, including maps and FAQs, is available at www.fairfaxcounty.gov/dpwes/environmental/cbay/.

3.5.3.B Floodplain Regulation

A floodplain is the flat area located adjacent to a stream channel that is prone to flooding. When stream banks overflow during or after a storm, the floodplain provides natural storage for the excess water. In Fairfax County, the 100-year frequency storm is used to determine the limits of the floodplain.

The Floodplain Regulations of the Zoning Ordinance establish two types of regulated floodplain areas:

- The “Minor Floodplain,” associated with streams with drainage areas between 70 and 360 acres.
- The “Major Floodplain,” associated with streams with drainage areas greater than 360 acres.

The Floodplain Regulations serve a number of purposes. They are intended to protect against loss of life, health or property from flood or other dangers. They are also intended to preserve and protect floodplains in as natural a state as possible, thereby (1) preserving wildlife habitats; (2) maintaining the natural integrity and function of the streams; (3) protecting water quality; and (4) promoting a zone for ground water recharge.

A limited number of uses are permitted in floodplains, although additional uses can be approved by the Board of Supervisors through a special exception. All floodplain uses are subject to a series of limitations that serve to protect public safety and minimize adverse environmental impacts associated with these uses.

Floodplain Regulations are addressed in Part 9 of Article 2 of the Zoning Ordinance, available at www.fairfaxcounty.gov/dpz/zoningordinance/articles/art02.pdf.

3.5.3.C Wetlands Zoning Ordinance

Fairfax County has approximately 112 linear miles of tidal shoreline, according to the Center for Coastal Resources Management of the Virginia Institute of Marine Science. This shoreline traverses south along the Potomac River from Cameron Run to the Occoquan Reservoir, where the tidal influence terminates at the dam.

Tidal wetlands are valuable natural resources that help prevent flooding, improve water quality and provide habitat. The Wetlands Zoning Ordinance was adopted in recognition of the environmental functions provided by tidal wetlands in the county and the need to ensure that development activities in tidal areas occur in a manner that minimizes adverse impacts to these wetlands.

The Fairfax County Wetlands Board has adopted a “Living Shoreline” Stabilization Policy that encourages vegetative shoreline stabilization in shoreline areas which are appropriate for such stabilization. The policy is available at www.fairfaxcounty.gov/dpz/environment/finallivingshoreline.pdf.

In 2015, the Virginia Marine Resources Commission finalized the regulations and guidance to support the general permit for the use of living shoreline measures as the preferred alternative to stabilizing tidal shorelines. The Living Shoreline General Permit can be found at www.mrc.virginia.gov/regulations/MRC_Scanned_Regs/Habitat/FR1300_09-01-15.pdf.

The Board of Supervisors asked staff to develop a strategy to inform homeowners about the regulations for tidal shoreline property that protect against negative impacts to the environment. As a result of that request, staff developed an information sheet for owners of tidal shoreline property. The information sheet is available at www.fairfaxcounty.gov/dpz/environment/wetlands/mailingbrochure.pdf.

This informational flyer was mailed to approximately 1,000 property owners and residents along the County’s tidal shoreline in early March 2016. Staff from the Departments of Planning and Zoning and Public Works and Environmental Services worked collaboratively to update permitting information and requirements on the respective department websites, which may be found at www.fairfaxcounty.gov/dpz/environment/wetlands and www.fairfaxcounty.gov/dpwes/sitedevelopment.

Before making changes to waterfront property or undertaking land-disturbing activities, a property owner may need to obtain a permit from the Wetlands Board and other agencies.

The Wetlands Board requires mitigation or compensation for unavoidable tidal wetlands loss, as explained in its policy, available at www.fairfaxcounty.gov/dpz/environment/wetlands/mitigation_compensation_policy_adopted.pdf.

3.5.3.D Comprehensive Plan Policy

The Environment section of the Policy Plan volume of the Comprehensive Plan provides broad environmental policy guidance that is applied during the zoning process. The Environment section includes numerous policies, including those recommending the identification, protection and restoration of Environmental Quality Corridors (EQCs) and streams and buffer areas upstream of EQCs.

The EQC system is an open space system in Fairfax County designed to preserve, restore and link natural resource areas. The core of this system is the county's streams. The EQC policy recommends protection and restoration of environmentally-sensitive lands, including a number of features near streams (steep slopes in stream valleys, wetlands connected to stream valleys and 100-year floodplains). The policy also recommends protection and restoration of upland habitats that augment the habitats and buffers provided by stream valleys. The EQC policy has been refined since its initial adoption in 1975 but continues to be a centerpiece of Fairfax County's environmental policy.

The Department of Planning and Zoning, which negotiates zoning commitments made by developers, estimates that EQC commitments have protected thousands of acres of land that would not otherwise have been protected through regulation. Flexible zoning provisions often allow developers to concentrate densities/intensities on the less-sensitive portions of their sites, thereby achieving both desired levels of development and the protection of EQCs and other desirable open space.

The EQC policy is found in Objective 9 of the Environment section of the Policy Plan, available at www.fairfaxcounty.gov/dpz/comprehensiveplan/policyplan/environment.pdf.

3.6 Trees and Tree Conservation

Fairfax County's urban forest is critical to enhancing the livability and sustainability of our community. Management of the trees within our urban forests to maximize the multitude of benefits they provide to residents is an essential step in successfully reaching the commitments and goals of



Huntley Meadows

the Board of Supervisors' Environmental Agenda, the Tree Action Plan, the Cool Counties Climate Stabilization Initiative and other county public health, livability and sustainability initiatives and programs.

An August 2010 study commissioned by the county using i-Tree Ecosystem Analysis assessed the structure, function and value of the Fairfax County urban forest as of 2009. According to the assessment, Fairfax County's urban forest has over 20,900,000 trees that provide significant environmental, economic and

social benefits. Each year, this urban forest removes 4,670 tons of air pollutants at a value of close to \$22 million a year, and stores 3,879,000 tons of carbon, equal to the annual carbon emissions from 1,169,000 single family homes. Other economic benefits include residential energy savings of approximately \$11.9 million (based on 2002 prices) due to shading and evaporative cooling. The i-Tree Ecosystem Analysis is available at www.fairfaxcounty.gov/dpwes/environmental/trees.htm.

The value of urban trees' and forests' contributions to human health and well-being, including physical and mental well-being, building a sense of community and economic development, are now well documented. Much of the social science on the value of urban forests and urban greening is available at the *Green Cities: Good Health* website of the University of Washington, <http://depts.washington.edu/hhwb/>.

3.6.1 Urban Forest Management

The Urban Forest Management Division (UFMD) of the Department of Public Works and Environmental Services is the primary county agency responsible for managing trees and forests in Fairfax County. UFMD coordinates and implements the county's efforts to manage our urban forest resources, including advancing the board's Environmental Agenda to:

- Increase tree conservation in land development.
- Improve air quality through tree conservation policies and practices.
- Improve water quality and stormwater management through tree conservation.
- Foster an appreciation for our urban forest and inspire county residents to protect, plant and manage trees and forest stands on public and private lands.

UFMD draws on science, education and strong partnerships to help achieve a healthy urban forest. Its key responsibilities and activities include:

- Implementing the Tree Action Plan. See www.fairfaxcounty.gov/dpwes/environmental/tap.htm/
- Conducting vegetation mapping and surveys.
- Developing ordinances and policy for tree preservation, including the Tree Conservation Ordinance and tree conservation provisions of the county's Public Facilities Manual. See www.fairfaxcounty.gov/dpwes/publications/pfm/chapter12.pdf.
- Providing public education and outreach at a range of venues, including community tree planting events, school programs and local fairs.
- Partnering with nonprofit environmental and tree planting groups in support of the county's tree planting and conservation efforts.
- Promoting the use of natural landscaping techniques on public and private property.
- Providing assistance on tree and landscape requirements and issues to residents, the development community and other county agencies throughout the land development process including:
 - Rezoning and other zoning case reviews.
 - Site plan reviews.
 - Site inspections.
 - Final inspections for bond release.
- Identifying, monitoring and providing limited suppression of forest insect pest infestations throughout the county to prevent defoliation and maintain the health of the urban forest. See www.fairfaxcounty.gov/dpwes/environmental/forest_pest.htm.

In addition, the Urban Forest Management Division provides staff support to the Tree Commission. The Tree Commission is comprised of 15 citizens appointed by the Board of Supervisors to advise the board on tree-related matters. These matters include tree conservation as well as vegetation preservation and planting. The commission also assists the UFMD in developing and maintaining technical specifications and guidelines. More information about the UFMD, including a link to the Tree Commission, is available at www.fairfaxcounty.gov/dpwes/environmental/ufmdmain.htm.

3.6.2 Tree Action Plan

The Tree Action Plan is a 20-year strategy for conserving and managing the county's tree resources. The Tree Action Plan, which was adopted

in December 2006, was developed through a collaborative process that involved the Tree Commission, county staff, residents and builders. The plan reflects three key goals: to commit to conserve current tree assets; to enhance the legacy for future generations; and to increase the effectiveness of urban forestry with planning and policymaking.

To achieve these goals, the Tree Action Plan includes 12 core recommendations through which trees are accorded a high priority and integrated into urban planning. Trees are not considered ornamental or decorative but, instead, are recognized as infrastructure providing environmental, economic and social benefits.

Tree Action Plan Core Recommendations

- Engage and educate.
- Engage and educate.
- Build strong partnerships and alliances.
- Optimize tree conservation in county policies.
- Improve air quality and address climate change through tree conservation.
- Improve water quality and stormwater management through tree conservation.
- Use ecosystem management to improve and sustain the health and diversity of our urban forest.
- Strengthen state-enabling authority for tree conservation.
- Encourage sustainable design practices.
- Plant and protect trees by streams, streets and trails.
- Optimize tree conservation in land development.
- Optimize tree conservation in utility and public facilities projects.
- Support and refine the county's urban forestry programs.

Each of the plan's 12 core recommendations includes goals, strategies and tactics to help achieve the recommendation.

The Board of Supervisors has taken a number of actions based on recommendations in the Tree Action Plan. For example, in June 2007, the board formally adopted a tree canopy goal of 43% for the county by the year 2037. A study of urban tree canopy in 2012 using high resolution satellite imagery showed 53 percent of the county is now covered by tree canopy. A follow-up tree canopy study will be completed in summer 2016, which will allow for an accurate determination of the gain or loss in canopy

over the last four years. To support tree planting programs to support the goals of the Tree Action Plan, the board established the Tree Preservation and Planting Fund (TPPF). The TPPF collects and disburses funding for tree-related projects to nonprofit organizations, county agencies and regional government agencies. The UFMD is currently looking at ways to more effectively implement the TPPF and establish partnerships to plant trees in the county.

More information, including links to the Tree Action Plan and the TPPF brochure, is available at www.fairfaxcounty.gov/dpwes/environmental/tap.htm/.

3.7 Solid Waste Management



The Fairfax County Solid Waste Management Program (SWMP) is responsible for providing solid waste management services in an efficient and cost-effective manner while complying with federal and state environmental regulations. The SWMP has

managed disposal and recycling services for Fairfax County residents and businesses since 1950.

3.7.1 Recycling

In 1990, the SWMP established a residential curbside recycling collection program. In 2015, Fairfax County reported a 50 percent recycling rate for municipal solid waste generated within the county.

In addition to curbside recycling, the SWMP has established a number of related recycling and waste disposal programs for county residents.

- Since the early 1990s, SWMP has operated two permanent collection sites where it accepts residents' household hazardous waste at no charge for disposal in accordance with local, state and federal regulations. See www.fairfaxcounty.gov/dpwes/trash/disphhw.htm.
- Recycling drop-off centers are located throughout the county. Items accepted vary by location, but all sites accept newspaper, mixed paper, glass jars and bottles and plastic bottles and jugs. See www.fairfaxcounty.gov/dpwes/recycling/doclst.htm.

- Each year, SWMP hosts secure document shredding events at various locations around the county. County residents can drop off up to five medium-sized boxes of sensitive documents for secure on-site shredding. See www.fairfaxcounty.gov/dpwes/recycling/shredding.htm.
- Since 2009, the county has collected over 1,100,000 pounds of obsolete electronics each year, including televisions, computers and peripheral



E-waste recycling

devices such as keyboards, speakers, printers and external drives. Currently, electronic waste, or e-waste, is collected daily at the two Recycling and Disposal Centers at no charge to county residents. See www.fairfaxcounty.gov/dpwes/recycling/electric-sunday.htm.

More information about the SWMP recycling programs is available at www.fairfaxcounty.gov/living/recycling/.

3.7.2 SWMP Green Initiatives

In addition to offering environmentally-responsible waste recycling and disposal options to residents, the SWMP strives to be environmentally responsible in its own operations. These operations include:

Waste-to-Energy – Solid waste disposal capacity in Fairfax County is provided by a waste-to-energy facility, located in Lorton, Virginia. This facility burns about 3,000 tons per day of solid waste. Incineration avoids the need to landfill refuse and the resulting production of potent greenhouse gases (GHG). About one half of a ton of carbon dioxide equivalent is prevented from being released into the atmosphere for each ton of solid waste processed. It also powers generators that produce about 80 megawatts of electricity; the sale of electricity to a regional



transmission market partially offsets the cost of operation of the county's solid waste management program. The facility has had a strong compliance history with its air pollution control and Title V permits, during its operational history. Use of reagents, scrubbers,

combustion controls and other technology to clean the stack gases ensures that roughly 98 percent of all pollutants are removed. See www.fairfaxcounty.gov/dpwes/trash/dispomsf.htm/.

Landfill Gas – The SWMP is responsible for managing two closed landfills in the county: the I-95 Landfill Complex and the I-66 Transfer Station. Landfill gas (LFG) collection systems are installed at both sites, with both supporting beneficial use of LFG as an alternative to natural gas or other fossil fuels. At the I-95 Landfill Complex, LFG is used to generate about 4.5 megawatts of electricity, which is sold to the local electric utility. LFG from the I-95 site is also used in the combustion process, which dewateres bio-solids at the county’s nearby wastewater treatment plant, thus avoiding the use of \$160,000 worth of natural gas. At the I-66 site, LFG is used to fuel heating systems for nearby bus maintenance garages, the transfer station worker’s facility and truck washes, thus avoiding the use of \$35,000 worth of natural gas. Beneficial use of the county’s LFG reduces atmospheric emissions that are equivalent to 260,000 tons of carbon dioxide. The reductions in atmospheric emissions come from gas that would otherwise be emitted by the landfill if no collection system were in place, and by using the collected gas in place of fossil fuels. See www.fairfaxcounty.gov/dpwes/trash/dispmethrvc.htm.

Wastewater Reuse – The SWMP partnered with the county’s wastewater treatment program to develop a wastewater reuse project. Under this project, about 1.3 million gallons of treated but non-potable water is pumped from the wastewater treatment plant to the waste-to-energy facility, where it is used as cooling water. Substituting non-potable for potable (drinking) water conserves water resources and reduces water purchase costs. See www.fairfaxcounty.gov/dpwes/wastewater/water_reuse/.

Other Sustainability Initiatives – The SWMP continues to pursue green initiatives. In 2011, the I-66 Transfer Station workers’ facility was designed and built as a LEED Silver facility. At the I-95 Landfill Complex, the SWMP is exploring the development of additional power generating capacity. This project, part of the Lorton Green Energy Triangle, involves the possible installation of solar panel arrays on the cap of the closed landfill.



3.8 Community Outreach, Education and Stewardship

3.8.1 Community Stewardship Opportunities

A wide variety of Fairfax County programs engage adults and youth in volunteer opportunities and other hands-on environmental stewardship activities, including:

- **Stream Monitoring** – Volunteers monitor local stream health four times each year. Training, equipment and certification are provided by the Northern Virginia Soil and Water Conservation District.
- **Storm Drain Marking** – The county’s network of storm drains directs stormwater to streams, not the wastewater treatment plant. As a result, substances dumped in the storm drains - from pet waste to trash - flow into county streams. To remind residents to protect the streams, program volunteers label storm drains with watershed-specific “no dumping” markers.
- **Stream Clean-ups** – Free supplies for litter cleanups in parks, streams and neighborhoods are provided through partnerships with community organizations including Clean Fairfax and the Alice Ferguson Foundation.
- **Tree Planting** – Fairfax County and partner organization Fairfax ReLeaf support volunteer tree planting in the spring and fall on community property, schoolyards and other sites.

More information about these and other watershed volunteer opportunities is available at www.fairfaxcounty.gov/dpwes/stormwater/volunteer.htm/.

Other volunteer opportunities focus on county parkland, including:

- **Invasive Management Area Program** – This Fairfax County Park Authority (FCPA) program recruits and trains volunteers to lead and participate in invasive plant removal in county parklands. See www.fairfaxcounty.gov/parks/resources/ima/.
- **Trail Improvements** – FCPA has seven trail partner groups that have adopted sections of the Cross County Trail. Each group is responsible for oversight and routine maintenance of its individual section. Re-routings and other trail improvements are also coordinated through these groups. See www.fairfaxcounty.gov/parks/cct/.
- **Adopt-A-Field/Adopt-A-Park** – This program is a cooperative venture between FCPA and interested community organizations and citizens. Groups or individuals assume maintenance responsibility for designated park areas or facilities. Areas within parks may include flower beds,

playgrounds, stream valleys, trees and other points of interest. See www.fairfaxcounty.gov/parks/volunteer/wp-adopt.htm.

More information about volunteer opportunities in the parks is available at www.fairfaxcounty.gov/parks/volunteer/rmdvol-main.htm.

County residents can also pursue service on one of the county's many boards, authorities and commissions that address environmental issues (see Section 1.2.3 of this report). Residents interested in serving on these committees should contact their Supervisors.

In addition to volunteer opportunities, the county and its partner organizations offer activities that promote environmental stewardship. A number of such activities are offered by the Northern Virginia Soil and Water Conservation District, including:

- *Sustainable Garden Tour* – Rain gardens, green roofs, porous pavers and other features are highlighted in this annual tour of innovative home, school and community gardens. See www.fairfaxcounty.gov/nvswcd/gardentour.htm.
- *Rain Barrel Program* – Participants build and take home low-cost rain barrels, reducing runoff and harvesting rainwater for reuse. Since 2007, more than 3,000 barrels have been distributed. See www.fairfaxcounty.gov/nvswcd/rainbarrels.htm.
- *Build-Your-Own Composter* – Each workshop participant builds and takes home a low-cost tumbler-style composter built from a recycled pickle barrel, gas pipe and pre-cut 2x4s. See www.fairfaxcounty.gov/nvswcd/announcements.htm.
- *Seedling Sale* – NVSWCD distributes low-cost native shrubs and trees to residents each spring for planting on private property. See www.fairfaxcounty.gov/nvswcd/seedlingsale.htm.



3.8.2 Presentations and Publications

One way the county promotes environmental awareness and stewardship is through its Facebook Environment page. Other ways include public education campaigns, presentations, awards and its website.

Young children can learn about a healthy environment with the “Stormy the Raindrop” program. This public education campaign encourages children to appreciate and take better care of their environment, and to pass on this desire to their peers and parents. The campaign includes two Stormy-themed activity books, puppet shows and numerous appearances at county events and venues. The program earned Best of Category in the National Association of Counties 2012 Achievement Awards. More information is available at www.fairfaxcounty.gov/dpwes/stormwater/stormy/.

For older children and teens, educational programs sponsored by the Fairfax County Park Authority (FCPA) supplement the hands-on activities described in Section 3.8.1. For example, the county’s Hidden Pond Nature Center and Park offers school-age children programs on wetlands ecosystems - its most requested program topic - as well as those on reptiles and amphibians and rocks, minerals and soil. More information about the Hidden Pond Nature Center school programs is available at www.fairfaxcounty.gov/parks/hidden-pond/schoolmenu.htm.

Residents of all ages can watch television programs with environmental themes produced by the county and broadcast on its Channel 16 station. Programs include Can the Grease, Stop Bagging our Streams, Green Buildings and Live Energy Efficient Now. These and other programs are available on a video-on-demand (VOD) basis at www.fairfaxcounty.gov/cable/channel16/vod.htm.

Meetings, seminars, festivals and townhall meetings provide additional options to enhance energy and environmental awareness. Speakers from county agencies and partner groups give presentations to neighborhoods and other community groups on a range of topics. Master Gardener, Master Naturalist and Tree Steward courses educate and establish a volunteer base for environmental projects and programs. Green Breakfast presentations sponsored by the Northern Virginia Soil and Water Conservation District engage county residents six times a year on emerging and innovative green topics. Meetings of the Fairfax County Environmental Quality Advisory Council (www.fairfaxcounty.gov/dpz/eqac/) and other boards and commissions are open to the public and offer more opportunities to hear from speakers about environmental issues in the county.

Award ceremonies also create opportunities to further environmental awareness. For example, each year the Board of Supervisors recognizes those who dedicate their time and energy to benefit the environment and support county environmental initiatives. Since 2000, 54 Environmental

Excellence Award winners have been selected. These awardees, who have been honored by the Board of Supervisors during its public meetings, include 18 county residents, 17 organizations, nine businesses, and 10 county employees. A list of award recipients is available at www.fairfaxcounty.gov/dpz/eqac/awards.htm.

In addition to the VOD programs, the county’s website offers a wealth of resources related to environmental awareness and stewardship. For example:

- The county’s Energy Action Fairfax Web pages include energy-saving tips and innovative video presentations to help homeowners reduce their energy consumption. See www.fairfaxcounty.gov/energyactionfairfax/.
- Stewardship Brochures published by FCPA address topics ranging from beavers to wildlife conflicts, while its Nature Pages help visitors explore the county’s environmental and cultural resources. See www.fairfaxcounty.gov/parks/resource-management.
- A Water Overview provided by the Department of Public Works and Environmental Services explains how the county manages various water uses - drinking water, stormwater and wastewater - and how residents can help keep water clean for future generations. See www.fairfaxcounty.gov/dpwes/environmental/water.htm.

3.9 Environmental Health

The Division of Environmental Health (DEH) provides public health services that protect the community from potential environmental hazards and exposures that pose a risk to human health—as the prevention of epidemics and spread of disease is one of the core functions of the Health Department. DEH has three program areas: the Consumer Protection Program; the Onsite Sewage and Water Program; and the Disease Carrying Insects Program. The primary services conducted by these programs include inspections, complaint investigations, commercial and residential plan reviews, surveillance and control activities and community outreach. DEH supports the general public, the regulated community and other agencies in encouraging healthy behaviors and maintaining voluntary, long-term compliance with state and local regulations.

DEH strives to integrate Health in All Policies (HiAP). By definition, HiAP recognizes that health and well-being are influenced by a variety of factors beyond health care, including the social and environmental conditions in our communities. HiAP is a collaborative approach to improving community

health by incorporating health considerations into decision-making across sectors and policy areas, including policies related to environmental sustainability and stewardship. The Health Department may participate in a Health Impact Assessment (HIA). HIA incorporates data, research, and stakeholder input to determine a project's potential impact on the health of a population and the environment.

DEH addresses sustainability within the following areas:

Ground and Surface Water – DEH regulates the design, installation, operation and maintenance of private sewage disposal and well water systems. Effective installation and maintenance allows for appropriate conveyance of sewage and protection of ground water and drinking water supplies from contamination.

DEH also partners with the Department of Public Works and Environmental Services to maintain the infrastructure of the public sewer system and reduce sanitary sewer overflows or accidental discharges to the environment. A brochure titled Understanding Your Grease Trap-Interceptor informs regulated food establishments of the procedures to prevent or reduce the amounts of fats, oil and grease (FOG) being discharged into the sewer. See www.fairfaxcounty.gov/hd/food/foodpdf/understanding-grease-trap.pdf.

Disease-Carrying Insects Program (DCIP) – The bite of an infected mosquito, tick or other vector of disease may result in a life-changing illness, such as West Nile virus, Zika virus, Chikungunya virus or Lyme disease. The DEH's Disease Carrying Insect Program, established in 2003, works to minimize the threat of vector-borne diseases through active surveillance, community education and vector management to help protect county residents. The DCIP utilizes an ecological approach to control pests of public health importance, guided by the principle of Integrated Pest Management (IPM). IPM combines appropriate pest control strategies into a unified, site-specific plan. The goal of an IPM program is to reduce pest numbers to acceptable levels in ways that are practical, cost-effective and safe for people and the environment. Pesticides are just one component of IPM that can be utilized in combination with other methods such as public education and personal protection—as behavioral change at the individual and community level can significantly reduce the need for pesticide applications. Most larvicides used by the DCIP are derived from naturally-occurring soil bacteria that specifically target mosquitoes, minimizing the impact on non-target organisms that may be beneficial to the environment. Products with different modes of action and active ingredients are

routinely rotated across years to help minimize pesticide resistance in local vector populations. See www.fairfaxcounty.gov/hd/westnile/.

Rabies – Rabies is a preventable viral disease of mammals most often transmitted through the bite of a rabid animal. The vast majority of rabies cases reported to the Centers for Disease Control and Prevention each year occur in wild animals like raccoons, skunks, bats and foxes. Domestic animals account for less than 10 percent of the reported rabies cases. State law and county ordinance require dogs and cats four months of age and older to be inoculated against rabies. See www.fairfaxcounty.gov/hd/rabies/.

Radon – Radon is a naturally-occurring radioactive gas produced by the breakdown of uranium in soil, rock and water. It cannot be seen, smelled or tasted. Long-term exposure to elevated radon levels is estimated to cause thousands of lung cancer deaths nationally each year. The Fairfax County Radon Potential Map provides a general description of radon within Fairfax County. The county Radon Web page also provides links for more information from the Virginia Department of Health and U. S. Environmental Protection Agency. See www.fairfaxcounty.gov/hd/air/radon.htm.

Naturally-Occurring Asbestos – Naturally-occurring asbestos has been mapped in approximately 11 square miles of Fairfax County and Fairfax City. Asbestos-bearing rock is interspersed in the greenstone rock formations that underlie the surface soils in the orange soils group.

Surface exposures of these rock formations are not usually seen. See www.fairfaxcounty.gov/hd/chs/natural-asb.htm.

3.10 Noise, Light Pollution and Visual Pollution

While not traditionally considered to be sustainability issues, noise, light pollution and visual pollution can adversely affect the county's environment and quality of life.

3.10.1 Noise

The county has long had a Noise Ordinance that limits the noise that can be generated from stationary and other sources. Noise generated from airport and highway operations is not within the county's regulatory purview, however.

Although noise from airport operations is not addressed in the Noise Ordinance, the county has taken steps to ensure that land uses near Washington Dulles International Airport will remain compatible with airport operations into the future. The Zoning Ordinance includes an Airport Noise Impact Overlay District in the area of the county near the airport.

This district establishes interior noise standards and associated acoustical mitigation requirements that apply to development that is pursued within the district. Additionally, Comprehensive Plan policy recommends against new residential development within specific areas near the airport.

The Comprehensive Plan also provides guidance regarding land use compatibility near highways. Applying this guidance during the zoning process, the county has obtained commitments from developers to noise mitigation measures, including highway noise barriers and acoustical mitigation for noise-sensitive indoor areas.

A comprehensive set of links addressing various transportation and other noise-related concerns is available at www.fairfaxcounty.gov/dpz/environment/noise.

3.10.2 Light Pollution

“Light pollution” is used to describe light output, primarily from exterior (outdoor) sources, that is excessive in amount and/or that causes harmful glare directed into: (1) the path of travel; (2) light-sensitive areas such as residential neighborhoods; or (3) the sky in general. Light pollution can occur in commercial, residential and roadway settings.

Light pollution can interfere with enjoyment of the night sky. Improper lighting can also waste energy. In recognition of these impacts, the county has established an Outdoor Lighting Ordinance. To reduce glare, the ordinance requires full cut-off lighting fixtures in most cases. Such fixtures prevent light from being emitted at or above a horizontal plane drawn through the bottoms of the fixtures.

The requirements of the Outdoor Lighting Ordinance do not affect the outdoor lights used by most homeowners. Requirements apply to roof and canopy lighting, architectural and landscape lighting, recreation/sports facility lighting and internally-illuminated signs. In addition, the ordinance establishes after-hours parking lot lighting reduction requirements for developed nonresidential lots that contain four or more parking light poles.

More information about the county’s outdoor lighting rules is available at www.fairfaxcounty.gov/code/lighting/.

3.10.3 Visual Pollution

Litter, unkempt properties and poorly-placed signs are typically considered examples of visual pollution that degrades the environment. Fairfax County has taken steps to address visual pollution, including:

- Public outreach on litter-related issues. See www.fairfaxcounty.gov/dpwes/trash/litter.htm.
- A blight abatement program that provides for the reporting and remediation of vacated, dilapidated structures. See www.fairfaxcounty.gov/code/property/blight/.
- Zoning Ordinance limitations on signs. See www.fairfaxcounty.gov/dpz/zoningordinance/articles/art12.pdf.
- A review process for proposed telecommunications towers. See www.fairfaxcounty.gov/dpz/2232/submit_application.htm.

In addition, in early 2013, Fairfax County and the Virginia Department of Transportation (VDOT) finalized an agreement regarding signs placed in VDOT public rights-of-way. State law makes all such signs, including political advertising, illegal. The agreement authorizes the county, acting on behalf of VDOT, to remove the illegal signs and fine the offenders in accordance with state code.