
ANNUAL REPORT
on the
ENVIRONMENT

2008



Fairfax County, Virginia

Environmental Quality Advisory Council
November 2008

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INTRODUCTION

This year's Annual Report on the Environment has been prepared by the Environmental Quality Advisory Council. Staff support for the coordination and printing of the report has been provided by the Planning Division of the Department of Planning and Zoning.

The Annual Report on the Environment, which is an update on the state of the county's environment, serves a threefold purpose. Initially, it is intended to assist the Board of Supervisors in evaluating ongoing environmental programs and to provide the basis for proposing new programs. The document also aids public agencies in coordinating programs to jointly address environmental issues. In addition, the report is directed to residents and others who are concerned with environmental issues.

The report continues to include chapters on major environmental topics including: global climate change as it relates to Fairfax County; land use and transportation; air quality; water resources; solid waste; hazardous materials; ecological resources; wildlife management; and noise, light, and visual pollution. An appendix addressing state legislation relating to the environment is also provided, as is an appendix providing EQAC's resolutions and positions taken over the past year. Within each chapter are: a discussion of environmental issues; a summary of relevant data; and a discussion of applicable government programs. Most of the chapters conclude with recommendations that identify additional actions that EQAC feels are necessary to address environmental issues. As was the case in last year's report, recommendations are presented in two formats: items addressing ongoing considerations and continued support for existing programs are noted as "comments." Items addressing new considerations, significant refinements of previous recommendations, or issues that EQAC otherwise wishes to stress are presented as "recommendations."

EQAC is in the process of preparing a new chapter addressing environmental stewardship efforts and opportunities. EQAC anticipates that this chapter will be completed by spring 2009.

This report covers activities affecting the environment in 2007; however, in some cases, key activities from 2008 are also included.

While the Environmental Quality Advisory Council has prepared and is responsible for this report, contributions were made by numerous organizations and individuals. Many of the summaries provided within this report were taken verbatim from materials provided by these sources. EQAC therefore extends its appreciation to the following:

Audubon Naturalist Society
Citizens for the Abatement of Airport Noise
Clean Fairfax Council, Inc.
Coalition for Smarter Growth
Fairfax County Deer Management Committee
Fairfax County Department of Systems Management for Human Services
Fairfax County Department of Planning and Zoning
Fairfax County Department of Public Works and Environmental Services
Fairfax County Department of Transportation
Fairfax County Executive's Office
Fairfax County Environmental Coordinator
Fairfax County Fire and Rescue Department
Fairfax County Health Department
Fairfax County Park Authority

Fairfax County Police Department, Division of Animal Services
Fairfax County Trails and Sidewalks Committee
Fairfax County Wildlife Biologist
Fairfax Joint Local Emergency Planning Committee
Fairfax ReLeaf
Fairfax Water
Illuminating Engineering Society of North America
International Dark-Sky Association
Interstate Commission on the Potomac River Basin
McLean Land Conservancy
Metropolitan Washington Airports Authority
Metropolitan Washington Council of Governments
Northern Virginia Conservation Trust
Northern Virginia Regional Park Authority
Northern Virginia Soil and Water Conservation District
Reston Association
United States Fish and Wildlife Service
United States National Museum of Natural History
Upper Occoquan Sewage Authority
Virginia Department of Conservation and Recreation
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Environmental Quality
Virginia Department of Transportation
Virginia Outdoor Lighting Taskforce
Virginia Outdoors Foundation

Finally, EQAC wishes to acknowledge the efforts of the county's interagency Environmental Coordinating Committee, which coordinated the staff responses to the recommendations within EQAC's 2007 *Annual Report on the Environment*.



County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

Board of Supervisors
County of Fairfax
12000 Government Center Parkway
Fairfax, VA 22035

November 17, 2008

Chairman Connolly and Members of the Board:

The Environmental Quality Advisory Council is pleased to present the 2008 Annual Report on the Environment. In this report, we discuss various environmental issues in Fairfax County and make recommendations as to what actions the county should take to resolve identified problems. The report consists of nine chapters – each chapter addressing a different aspect of the environment. This includes the newest chapter to reflect the county’s leadership and efforts to address global climate change. This is the initial chapter and the rest of the chapters are arranged to reflect the order of topics listed in the Board of Supervisors’ Environmental Agenda. EQAC is in the process of preparing a new chapter that will highlight environmental stewardship issues and opportunities. We anticipate providing this as a stand-alone chapter to the board next spring, and future reports will incorporate this new chapter.

EQAC thanks the board for its continued strong support of environmental programs. We continue to find that every year, Fairfax County’s programs improve and advance in their environmental stewardship, often setting the standard for the rest of Virginia’s counties.

We understand that budget constraints this year have impacted all programs within the county and have resulted in some very challenging choices, including those affecting environmental services. We therefore have three very specific requests this year.

First and foremost, we ask that you continue to support the breath and depth of the environment programs you have established. All of these programs are essential if we are to maintain the high quality of life we have in Fairfax County and the high standards we have set for ourselves. We note that for Fairfax County residents, quality of life is not just about good schools and jobs but also about having a clean and healthy environment in which to live and recreate. This support for environmental programs includes funding for the Environmental Improvement Program for the upcoming fiscal year. The EIP is a reflection of those non-stormwater programs, including implementation of the Cool Counties initiative. Funding the EIP is necessary to implement the Environmental Agenda adopted by the board for this county.

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Board of Supervisors
Continued

Secondly, EQAC recommends that the county consider implementation of a stormwater utility fee at this time. This has been a long held recommendation of EQAC. Implementation of the stormwater utility fee would remove the costs of stormwater management from the annual budget and create a program that would be essentially a fee for service provided for the citizens and businesses of the county.

Thirdly, EQAC requests that the county move forward with an Energy Coordinator position as recommended in the FY 2009 Environmental Improvement Program. Implementation of this position would allow Fairfax County to more fully implement efforts in support of the Cool Counties initiative that the county played such an integral role in establishing. We also note that this position should result in long-term cost savings through continued improvements in energy efficiency. We are also concerned that, without this position, many of the actions that are needed to support the Cool Counties initiative will not be able to be implemented.

We also thank you for your commitment and funding for the replacement of the county's rather old information system (the Urban Development Information System, or UDIS) with a highly flexible database that will allow the county to do innovative design and management for all the county's resources and make information much more accessible to citizens. Several members of EQAC had the opportunity for a briefing on this program and are delighted with the progress being made and the improvements in the county's understanding and management of its assets.

Each chapter of this year's Annual Report contains the remainder of our recommendations. We urge you to consider and act on each of these.

This report covers 2007, but also includes significant actions from 2008 that could impact EQAC's comments and recommendations. We recognize that the report does not capture all ongoing actions; if we tried to accomplish this, the report would never be finished and would be even longer.

As previous reports have done, we would like to commend the outstanding efforts of the following groups whose actions improve and safeguard the environment in Fairfax County. The Northern Virginia Soil and Water Conservation District continues its work to provide excellent education programs, to consult with the county on innovative stream restoration work, to have a large and successful stream monitoring program and to be available to residents and developers alike for site work consultation. The Northern Virginia Conservation Trust continues to obtain easements on privately owned environmentally sensitive land. Volunteers from the Audubon Naturalist Society provide valuable data on water quality. Fairfax ReLeaf continues to promote tree preservation and tree replacement programs. The Park Authority staff continues to provide exemplary service due to a small group of dedicated individuals, working with a very small budget, who are slowly enhancing environmental efforts in the county's parks. The members of EQAC thank all these groups, and all others who work to preserve and enhance the environment of the county.

As we do each year, EQAC would like to thank and commend the county staff for its continued outstanding work. We thank staff especially for providing the data for this

Board of Supervisors
Continued

report and for a continued willingness to meet with EQAC to discuss various issues. We commend the county's Environmental Coordinating Committee, which is chaired by Deputy County Executive Robert A. Stalzer, for its continued efforts at managing environmental action within the county. We appreciate the ECC's willingness to meet with EQAC twice a year and to discuss issues of environmental significance.

It gives me great pleasure as the representative of EQAC to thank and acknowledge the work of two individuals. Every year we do this and every year the members of council continue to be impressed with the work and input of these two people. First, we need to mention Noel Kaplan of the Environment and Development Review Branch, Department of Planning and Zoning. Noel provides county staff support to EQAC. Noel sets up and tapes every EQAC meeting, follows up on actions generated from the meetings, and coordinates the inputs and publication of the Annual Report. Although the members of EQAC write the Annual Report, it is Noel who makes publication of the document possible. EQAC cannot thank him enough for his hard work and long hours in our support.

Second, we thank Kambiz Agazi, Environmental Coordinator, Office of the County Executive, who also attends all of our meetings and provides helpful advice and suggestions. His insight and his overview of county environmental activities are invaluable to our work. EQAC thanks him for his assistance and valuable contributions.

Third, as I did last year, I would like to personally recognize my fellow EQAC members. They represent a diversity of views that allows for knowledgeable discussions and results in thoughtful recommendations. They spend extensive time investigating issues, write excellent resolutions and produce comprehensive chapters on subjects they have carefully researched. They are to be commended for their efforts.

In conclusion, EQAC encourages the Board of Supervisors to both support and fund all of the valuable programs designed to protect the county's environment and enhance the quality of life for its residents. We continue to urge you to take a look at how to integrate these excellent programs to maximize your efforts and returns.

The members of EQAC thank the Board of Supervisors for its leadership and look forward to continue working with you to achieve the goals of the Environmental Agenda in the coming years.

Respectfully submitted,



Stella M. Koch, Chairman
Environmental Quality Advisory Council

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SCORECARD
Progress Report on 2007 Recommendations

I. CLIMATE CHANGE

Climate Change Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the county hire an Energy Coordinator who will coordinate efforts among a number of county agencies to build coordinated, cross-agency efforts to enhance energy conservation and efficiency.	This recommendation is in the process of being addressed. The board directed the county executive to include a countywide energy manager position in the fiscal year 2009 budget. On February 25, 2009, the county executive presented the proposed budget with the energy coordinator position.	EQAC notes that an energy coordinator has not yet been hired. EQAC continues to support the hiring of an energy coordinator for Fairfax County.	No.

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II. LAND USE AND TRANSPORTATION

Land Use & Transportation Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1a. EQAC recommends that the county produce an updated version of the “State of the Plan, An Evaluation of Comprehensive Plan Activities.”	The Department of Planning and Zoning uses a different approach to Plan monitoring than that recommended by EQAC. This approach addresses the quantification of Plan change in a GIS application called the Comprehensive Plan Potential Application.	The current process does not provide a comprehensive review of the interrelationships between sections and does not review the underlying principals of the plan. EQAC reiterates its recommendation.	No.

<p>Land Use & Transportation Recommendations</p>	<p>Action taken by Agency or Department</p>	<p>EQAC Comments</p>	<p>Completed</p>
<p>1b. EQAC recommends that the county assess the state of the county with respect to the PLUS principles set forth in 1975.</p>	<p>An assessment of the Comprehensive Plan using the PLUS Principals as measurement tools is not addressed. The Department of Planning and Zoning is evaluating the Comprehensive Plan through other means as mentioned in the response to recommendation 1a.</p>	<p>Because of the significant impacts of new developments and transportation projects, EQAC feels the current Plan monitoring process is not comprehensive enough to accommodate these new developments.</p>	<p>No.</p>
<p>2a. EQAC recommends that Geographic Information System tools and capabilities continue to be pushed out for use by the general public.</p>	<p>Web-based GIS tools are available that enable county residents to view a range of data. Planning for the next version of My Neighborhood is underway, with the intent to include linkage to more land use information.</p>	<p>EQAC commends the county for developing the Web-based GIS tools. We continue to recommend that the county find ways to further empower the public and leverage our existing investments.</p>	<p>In process.</p>
<p>2b. EQAC recommends that the county begin leveraging three-dimensional models into the planning process.</p>	<p>This recommendation is being addressed. Staff uses aerial imagery, oblique imagery and three-dimensional modeling as part of the current review process for Plan amendments and special studies. Thus far, staff's use of three-dimensional tools in development review and in the review of Plan amendments has been limited to bulk massing illustrations and fly-throughs. In the future, staff will explore other programs as they become available to determine the most effective and user-friendly application.</p>	<p>While the county has taken initial steps, EQAC recommends that the county improve the ability to leverage three-dimensional models in the planning process.</p>	<p>In process.</p>

Land Use & Transportation Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
2c. EQAC recommends that the county invest in models that leverage GIS capabilities and county data.	This recommendation is being addressed. Staff recognizes the importance of the development of models that leverage GIS capabilities and county data. Runoff modeling at the macro scale is being standardized county-wide through the services of an engineering firm contracted in FY 2007. Micro level modeling will be used whenever needed for narrower scope.	EQAC is pleased that its recommendation is being addressed and reiterates the full recommendation.	In process.

III. AIR QUALITY

Air Quality Recommendation	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the county add one supervisory staff position to provide needed compliance assistance, program coordination and public outreach in order to help eliminate ozone-related air pollution violations occurring within the county, in order to reach full compliance with PM 2.5 ambient air quality standards and in order to ensure adequate participation in regional planning activities.	The recommendation has not been addressed. The air quality staff concurs with the recommendation and notes that funding will need to be added for this additional position.	EQAC reiterates its recommendation.	No.

IV. WATER RESOURCES

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. Continue to adequately fund and implement the county's ongoing water resource monitoring, management, restoration and educational stewardship programs.</p>	<p>The FY 2008 budget included the dedicated penny from the real estate tax to fund stormwater management and watershed improvement initiatives (Fund 318), including the development and implementation of watershed master plans. Staff concurs that funding levels continue to be adequate to support and enhance existing programs.</p> <p>DPWES continues to partner with various agencies, including the U. S. Geological Survey, Northern Virginia Soil and Water Conservation District, Health Department, Fairfax County Park Authority and others, to maximize program effectiveness and implement programs and projects that will over time improve water quality throughout the county.</p>	<p>EQAC commends the Board of Supervisors for continuing to fund the county's stormwater and watershed management efforts through the dedicated penny on the real estate tax. The resulting funds increased by \$100K from FY 2008 to FY 2009. However, based on budget constraints in the FY 2009 budget, \$8.7 million of staff support, equipment and materials was shifted from the general fund to the penny (Fund 318). This 38% decrease in funding delays future project implementation. EQAC continues to encourage the creation of a sustainable and stable funding source for watershed improvement initiatives.</p> <p>EQAC commends county staff for coordinating and leveraging resources by partnering with various agencies.</p>	<p>In process.</p>

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>2. EQAC supports efforts to establish a framework for ensuring proper and timely maintenance of alternative onsite sewage disposal technology and recommends that a related report include the requirement that owners with alternative septic systems be required to file a maintenance plan for their systems and provide evidence of compliance.</p>	<p>The Health Department, with assistance from American Water/Applied Water Management, has developed a report that establishes a framework for ensuring appropriate maintenance and management of existing and future septic systems in the county is undertaken. Stakeholder feedback from homeowners, realtors, homebuilders, environmental advocates, septic contractors and engineers was incorporated into the plan recommendations. The final report will be presented to the Board of Supervisors in 2008 for approval.</p>	<p>EQAC is pleased that this recommendation is being addressed and commends the Health Department for its work on developing the report and incorporating stakeholder feedback. EQAC is also pleased that the final project will be presented to the Board of Supervisors in 2008.</p>	<p>In process.</p>

V. SOLID WASTE

Solid Waste Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC recommends that the county explore the possibility of establishing mechanisms to ensure that recycling efforts in county schools will be as rigorous as the efforts now required of county businesses.</p>	<p>Recycling requirements in all schools (public and private) are now equal to requirements of business. The Fairfax County Public Schools are in the process of developing regulations to implement the policy.</p>	<p>EQAC commends the Fairfax County School Board for its actions. Once the regulations are implemented, EQAC's recommendation will be fully satisfied.</p>	<p>Yes</p>
<p>2. EQAC recommends that, in order to improve residential recycling rates and reduce unsightly and litter-producing open recycling bins, the county establish a test program to determine the effectiveness of requiring the use of single, large closed containers for curbside pickup of all recyclable materials.</p>	<p>When the county's Solid Waste Management Program revised Fairfax County Code, Chapter 109.1, the issue of whether or not to require collection companies to provide containers was discussed. The decision was made not to require such containers at this time due to the cost impact. However, the county is considering a test project where larger containers for recyclables (with lids) will be placed in neighborhoods that can accommodate this size of container.</p>	<p>Once the county's test project is completed, EQAC will evaluate the results and determine if EQAC wants to reiterate this recommendation.</p>	<p>In process.</p>

VI. HAZARDOUS MATERIALS

<p>There were no recommendations in the 2007 Annual Report</p>

VII. ECOLOGICAL RESOURCES

Ecological Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. FCPA approved a Natural Resource Management Plan in 2004. However, most of this plan cannot be implemented without additional staff and funding. A phased funding approach will allow FCPA to begin to manage ten percent of parklands and set up the program to be phased in over time. Phase 1 would require \$650,000 and six positions. EQAC recommends funding and staff positions to implement Phase 1 and that some of the six positions be found from internal FCPA staff assets.</p>	<p>The Park Authority sought funding for the NRMP through the regular budget process for the last few years. Neither funding nor staff was provided in the FY2008 budget. At this time, the Park Authority is unable to reallocate staff to the natural resource management position without sacrificing other important existing programs and services to the public. The Park Authority will continue to work with the Department of Management and Budget to seek funding in future years.</p>	<p>EQAC continues to support the Park Authority in seeking funds for implementing the NRMP. However, EQAC also notes that a portion of its recommendation was that the Park Authority use internal staff assets to fill some of the required staff positions. This was not done and EQAC believes that this should be done. Based on the importance of implementing the NRMP and recognizing the tight budget conditions, EQAC reiterates its recommendation but now recommends that most of the staff positions be found from internal resources.</p>	<p>No.</p>

Ecological Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>2. EQAC continues to recommend that the Virginia State Code §15.2-961 be amended to include tree preservation requirements.</p>	<p>Between this year and last year, a committee consisting of representatives for the Northern Virginia Building Industry Association, the Virginia Forestry Board, the Fairfax County Tree Commission, the Fairfax County Urban Forest Management Division, State Delegate David Bulova and State Senator Patsy Ticer worked on reaching consensus on achieving a more robust tree conservation enabling authority. This goal was achieved with the passage of both House Bill 1437 and Senate Bill 710.</p>	<p>EQAC appreciates the hard work that went into achieving agreement that more robust tree conservation enabling authority is needed. Now that Fairfax County has the needed enabling authority for tree conservation, EQAC supports county staff in developing regulations and standards that will take full advantage of this new tree conservation authority.</p>	<p>Yes.</p>

VIII-1. IMPACTS OF DEER IN FAIRFAX COUNTY

There were no recommendations in the 2007 Annual Report

VIII-2. IMPACTS OF GEESE IN FAIRFAX COUNTY

Geese Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC strongly recommends additional staffing for the county's wildlife management program in the form of a second full-time equivalent Assistant Wildlife Biologist, to undertake several initiatives relating to geese management.	This recommendation has not been addressed. The request for this additional position was not included in the fiscal year 2009 advertised budget plan. Staff concurs with EQAC's recommendation so that this additional Assistant Wildlife Biologist can undertake the responsibilities necessary to make this program more effective.	Resident geese continue to cause significant impacts to public facilities. EQAC reiterates its recommendation.	No.

VIII-3. COYOTES IN FAIRFAX COUNTY

There were no recommendations in the 2007 Annual Report

VIII-4. WILDLIFE BORNE DISEASES OF CONCERN IN FAIRFAX COUNTY

There were no recommendations in the 2007 Annual Report

IX-1. NOISE

Noise Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. In recognition of the federal approval of construction of new runways at Washington Dulles International Airport, formally request the Metropolitan Washington Airports Authority and the Federal Aviation Administration to evaluate options for the operation of the existing and new runways to identify approaches that will optimize flight operations in a manner that minimizes community noise exposure.</p>	<p>Staff generally concurs with this recommendation but questions its timing. Staff notes that this recommendation is the same as in EQAC’s 2006 Annual Report on the environment and repeats the response to that recommendation. Staff notes that the first of the two new runways will not be operational until late 2008. Therefore, it may be premature to issue such a request at this time. Staff also notes that the Fairfax County Airports Advisory Committee advises the Board of Supervisors on airport-related issues and will have an interest in this issue. Therefore, staff encourages EQAC to coordinate with the Airports Advisory Committee and to reiterate or refine its recommendation based on the outcome of this coordination.</p>	<p>EQAC reiterates its recommendation.</p> <p>While the new runways at Dulles are not due to be operational until late 2008, experience with the noise problems at National have shown that the concerns and requests should be lodged prior to initial operation in order that they may be properly monitored from the outset.</p>	<p>No.</p>
<p>2. Develop and distribute materials to educate the public on airport noise issues. Incorporate these educational materials into the county’s overall environmental educational efforts.</p>	<p>Staff agrees with the merits of this recommendation, but there are limited staff resources available. Staff is developing basic noise-related materials to include on the county’s Web site; however, resources are not available for a broader initiative at this time. Staff recommends that EQAC work with the Fairfax County Airports Advisory Committee for ideas on how this recommendation can be pursued in light of the limited resources.</p>	<p>EQAC is pleased that a series of Web pages have been established on the county’s Web site addressing noise issues. The county should ensure that this page is kept current through regular updates.</p>	<p>Partially.</p>

IX-2. LIGHT POLLUTION

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC recommends that the Board of Supervisors direct the Department of Planning and Zoning to place work on a revision to the Outdoor Lighting Ordinance high in its “Priority 1” work plan in order to address glare and several minor issues and to have such ordinance revisions ready for Board of Supervisors approval not later than July 2008.</p>	<p>Any revision to the outdoor lighting standards would require the adoption of a Zoning Ordinance amendment by the Board of Supervisors. Every year the board adopts a Zoning Ordinance Amendment Work Program which contains a Priority 1 list of items that staff will be working on during the year and a Priority 2 list of items that will not be addressed during the year. The Priority 1 ZOAWP list adopted by the board on April 30, 2007 contained an item to consider revisions to the outdoor lightning standards. A major component of this effort is contingent upon ongoing coordination and input from the Fairfax County Park Authority. The board, in considering the 2008 ZOAWP on March 31, 2008, included the changes to the Lighting Ordinance as a Priority 1 item.</p>	<p>EQAC recommends that the Department of Planning and Zoning move ahead with revising the Outdoor Lighting Ordinance as rapidly as possible.</p>	<p>No.</p>
<p>2. EQAC recommends that the Board of Supervisors direct the Fairfax County Park Authority to revise its specifications for athletic field lighting to correct the current deficiencies</p>	<p>This issue is in the process of being addressed through coordination and collaboration with key members of EQAC and DPZ. The Park Authority is addressing the issue in a White Paper that will be done in 2008.</p>	<p>EQAC should work with the Park Authority to review and fine tune the specifications for athletic field lighting to correct the current deficiencies.</p>	<p>No.</p>

IX-3. VISUAL POLLUTION AND URBAN BLIGHT

Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>1. EQAC recommends that the county continue negotiations with the commonwealth to enable the county to remove signs from the VDOT right-of-way and to enforce limitations and restrictions on such signage in the same manner as though the signs were covered under the Fairfax County ordinances, including the application of civil penalties.</p>	<p>Staff reevaluated its pilot program and, because of problems in enforcing the provisions of Va. Code Ann. §33.1-373, staff suggested to the board that the following be considered: enter into agreement with the Commonwealth Commissioner of Transportation for a very narrowly focused pilot program, which would allow the county to evaluate its effectiveness and cost; pursue addressing the issue through a partnership with the Sheriff's Office, Adopt-A-Highway and initiate an education program.</p>	<p>EQAC continues to recommend changes to Article 12-300 to deal with illegal signs. EQAC does support other efforts such as suggested by staff.</p>	<p>No.</p>

Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
<p>2. EQAC strongly recommends that the lack of an explicit provision in Article 12-300 of the present [sign] ordinance for assessment of civil penalties be rectified at the earliest opportunity. (EQAC provided suggested language.) It is further recommended that the modified ordinance be issued as a “Letter to Industry”. When an illegally posted sign is observed by an inspector, or reported by a resident, such a letter, containing the text of the ordinance, including the penalties clause, could be sent to the offending party as a means of strongly discouraging continuance or repetition of the violation.</p>	<p>Staff notes that current provisions in the ordinance do provide for penalties for violations and that staff’s experience is that a notice of violation served on the violator is more effective than a Letter to Industry. Staff will review the current notice of violation language to see if the language on civil prosecution including fines and/or injunctive relief is needed. EQAC may review any alternative approach that staff recommends and comment.</p>	<p>EQAC feels that that the problem of illegal signs continues and that this problem needs to be addressed. EQAC will be happy to work with staff on any alternative approach.</p>	<p>No.</p>

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER I

**FAIRFAX COUNTY
AND GLOBAL
CLIMATE CHANGE**

II. FAIRFAX COUNTY AND GLOBAL CLIMATE CHANGE

A. INTRODUCTION AND BACKGROUND

In the summer of 2006, Fairfax County was approached by the Sierra Club and was asked to join its Cool Cities Program. This program was designed to help cities meet the conditions of the U.S. Mayors Climate Protection Agreement, which was to reduce their greenhouse gas outputs 7 percent below their 1990 levels by 2012. After carefully reviewing the Cool Cities protocol, county staff recommended against participation in that specific program. However, at the insistence of the Chairman and other members of the Fairfax County Board of Supervisors, county staff was asked to develop a program that would be more robust and contain similar goals and be better suited to county protocols. This program, Cool Counties, which was first mentioned by Chairman Gerald E. Connolly in his 2007 State of the County address, was developed in collaboration with the Sierra Club and other local government partners, and was officially unveiled in July 2007 at the National Association of Counties annual conference that was held in Richmond, Virginia. Much of what Fairfax County lists within the framework of this Cool Counties program was initiated previously to address clean water and clean air issues. However, on October 1, 2007, county staff presented its climate change initiatives as part of its fiscal year 2009 Environmental Improvement Program (<http://www.fairfaxcounty.gov/living/environment/eip/>).

Solving climate change is admittedly a daunting task by any measure, but we as county governments have a unique role to play in this effort. Through our regional cooperation and influence on major environmental policy and operations like air quality, land use planning and zoning, transportation, forest preservation, solid waste management and recycling and water conservation, we can lead by example by looking at our own operations to assess what policy or program changes we have the authority and resources to enact in order to lower the emissions produced by our operations.

Fairfax County has already taken a number of these actions, such as purchasing hybrid vehicles, promoting green buildings, purchasing wind power and teleworking to name just a few. Fairfax now has 104 hybrids in its vehicle fleet. In 2006, the county converted one of its Toyota Priuses to a “plug-in-hybrid-electric” vehicle. This car travels up to 30 miles on electric power alone before dual power is used; it could have a fuel efficiency averaging over 100 miles per gallon of gas.

In addition, Fairfax County purchased 5.8 million kilowatt hours of wind energy per year during a two-year contract from April 2005 through March 2007. The wind energy contract resulted in a reduction of 6.2 million pounds of CO₂ over the contract period. In April 2007, the county signed a new three-year wind energy

purchase contract with 3-Phases Climate Solutions, Inc. Fairfax County will continue the commitment of purchasing 5 percent of the general county's electricity from wind energy in 2007 and 2008 and will expand to 10 percent of the general county usage in 2009.

Telework is another effective tool for reducing our CO₂ emissions by taking cars off our roadways and commuters out of already-crowded trains and buses. Removing just five percent of cars from the road reduces traffic congestion by up to 20 percent. In 2000, the Metropolitan Washington Council of Governments set the goal of having at least 20 percent of all eligible workers in our region telecommuting one day a week by 2005. All 17 jurisdictions in the region endorsed that goal, and Fairfax County was the first to achieve it.

A few additional examples of current county efforts that support greenhouse gas reductions include:

1. Land Use and Transportation Solutions

a. Board of Supervisors' Environmental Agenda and the Fairfax County Comprehensive Plan

Both the Board of Supervisors' Environmental Agenda and the county's Comprehensive Plan support development in transit-oriented, pedestrian friendly, mixed use centers. The concentration of new development in relatively high intensity, transit-oriented centers characterized by a mix of residential, employment and retail uses, and the provision of opportunities for non-motorized transportation to, from and within these centers should serve to reduce, in aggregate, the number of motor vehicle trips and vehicle miles traveled, and the associated CO₂ emissions, that would otherwise occur through more traditional suburban development patterns in the region. Numerous Area Plan Amendment and zoning actions have been taken to encourage and implement this approach to development, and the Board of Supervisors has adopted a definition and guidance for transit-oriented development in the Comprehensive Plan.

b. Ride Sharing, Telework and Other Transportation Policies

Transportation policies that serve to reduce vehicle trips and vehicle miles traveled (e.g., provision of transit support facilities; transportation demand management efforts such as ride sharing programs and incentives, telework opportunities, bicycle parking and shower facilities in offices, shuttle bus service, transit incentives, etc.) are implemented routinely through the zoning process.

c. Transportation Programs

Numerous transportation programs are also in place that serve to reduce vehicle trips and vehicle miles traveled, therefore reducing overall CO₂ emissions. These include:

- **Employer Services Program** – This program promotes transportation demand management strategies and associated outreach efforts to employers in Fairfax County, thereby reducing single occupancy vehicle trips.
- **South County Bus Plan** – This program has increased bus ridership significantly on Richmond Highway.
- **Fairfax County Transit Program** – This multi-modal transportation program supports Metro and Virginia Railway Express services. Metrorail trains will soon expand to eight car trains, VRE is replacing existing cars with double deck passenger cars, and CUE bus service will continue to be subsidized. Ridership on all transit systems (Fairfax Connector, Metro, VRE) serving the county has increased. To further encourage the use of mass transit, on Code Red and Code Purple Days, transit systems throughout the entire region offer free rides to all passengers.
- **Metrocheck** – This is a fare card voucher program that benefits employees using public transportation. Fairfax County's Employees Transportation Benefits Program provides up to \$105.00 per employee for transportation by bus, rail or vanpool.
- **Ridesources** – This program provides ridematching services to county employees and residents along with a marketing program to encourage its use.
- **County telework program** -- Currently, more than 1,300 county employees telework. Fairfax County is the first jurisdiction to reach — and then exceed — the regional goal set by the Metropolitan Washington Council of Governments to have 20 percent of the eligible workforce teleworking by the end of 2005. The county's outreach efforts on telework and other transportation demand management efforts have broader benefits countywide.

Facilities that support non-motorized transportation also serve to reduce motor vehicle trips and motor vehicle miles traveled. The county has provided substantial funding for the construction of trails in support of non-motorized transportation.

d. Tree preservation and planting

Planting efforts can also reduce CO₂ concentrations, as trees sequester carbon by absorbing CO₂ during photosynthesis and by storing carbon as biomass. For every acre of forest that the county is able to preserve and keep healthy, approximately 20 to 30 tons of carbon is stored. Fairfax County's tree canopy is currently estimated to cover 41 percent (104,000 acres) of the county; therefore, this equates to between roughly two and three million tons of carbon storage. An earlier study estimated that the biomass of the county's tree canopy stored over 3.5 million tons of carbon. It has also been estimated that the county's current tree canopy absorbs and stores an additional 11,700 tons of carbon annually. A single tree is capable of absorbing and storing an additional 600 to 700 pounds of carbon per year. It has therefore been calculated that between 110 and 130 trees can offset the carbon "footprint" (77,400 pounds of carbon dioxide) that is estimated to be produced by each household in Virginia annually. These data underscore the value of the county's urban forestry programs and other efforts that serve to protect and restore tree cover.

Requirements for the preservation of Resource Protection Areas and commitments during the zoning process to tree preservation efforts, landscaping efforts and the preservation and restoration of Environmental Quality Corridors all serve to enhance overall carbon sequestration, thereby supporting reduced atmospheric CO₂ concentrations. The establishment and enforcement of limits of clearing and grading on site plans, subdivision plans and grading plans also support reductions in CO₂ concentrations, as do tree planting initiatives and public outreach focusing on land stewardship issues such as tree preservation and planting.

The Fairfax County Board of Supervisors has adopted a tree canopy cover goal for the county of 45 percent coverage by the year 2037 and has approved a tree conservation ordinance to strengthen tree preservation policies and procedures. In addition, trees were identified as a special area of interest in the FY 2008 Environmental Improvement Program.

The county continues to support legislative efforts to strengthen local government authority to require tree preservation during development.

2. Energy Efficiency Solutions

a. Green Buildings

Fairfax County has adopted green building policies addressing its own capital projects as well as private sector development. Under the Sustainable Development Policy for Capital Projects (adopted by the Board of Supervisors on February 11, 2008), county projects greater than 10,000

square feet in size have a goal of achieving LEED® Silver certification; smaller facilities are recommended for LEED certification.

The Department of Public Works and Environmental Services has also accomplished innovative energy saving measures in many of its industrial plant processes. For example, the Noman M. Cole, Jr. Pollution Control Plant uses methane gas from landfills in its sludge burning process. As noted below, methane gas is also used to generate electricity at the I-95 Landfill site. The Division of Solid Waste collects and transports trash in Fairfax County to produce electricity in the Waste to Energy Facility. The Fairfax Center and Crosspointe Fire Stations, both of which are green building projects, opened recently. DPWES is incorporating the green building approach on nearly twenty active building development projects. The Park Authority will also be using green building technology on an expansion to one of its recreation centers.

On December 3, 2007, the Board of Supervisors adopted an amendment to the Policy Plan volume of the Comprehensive Plan that incorporated within the Plan support for green building practices and that served to promote the application of these practices. Included in the amendment were new policies establishing linkages between the incorporation of green building/energy conservation practices and the attainment of certain Comprehensive Plan Options, planned uses or densities/intensities of development. In the county's growth centers, commitments for green building practices sufficient to attain certification through the LEED program or its equivalent are expected for certain nonresidential and multi-story multifamily residential proposals (e.g., proposals seeking development at the high end of the planned density/intensity range; development seeking a Comprehensive Plan Option; development involving a change in use from what would be allowed as a permitted use under existing zoning; development at a planned Overlay Level). ENERGY STAR® Qualified Homes designations are expected for any other residential development proposed at the high end of the Plan density range.

b. Energy Efficiency

The county's Facilities Management Department has started an energy efficiency program for the buildings in its inventory. In 2005, 4,232,639 kWh were saved and in 2006 an additional 2,398,036 kWh were saved. Natural gas consumption was also reduced by 111,440 therms per year. Cost avoidance has been over \$4.0 million since 2001. These savings would be higher but for the new square footage that came on line during those fiscal years. This department has set an internal goal of a one percent annual reduction in kBtu/SF; recent numbers show an annual reduction averaging 1.9 percent. The annual savings are cumulative; therefore, after a

10 year period, reductions of 10-20 percent in energy usage per square foot are expected.

The Park Authority has begun to initiate the lighting retrofit, energy efficient motor upgrades, and automated controls portion of the Park Authority's energy management effort at eight recreation facilities. The Park Authority is committed to programmatically addressing energy management and has established an internal position to coordinate energy management initiatives and conservation throughout the agency. Once the project is complete in late 2008, the Park Authority will reduce costs and energy consumption by 16 percent in the facilities currently operating with antiquated systems while paying for itself within 2.7 years. These energy savings retrofit replacements will reap long term, system-wide environmental and cost benefits.

Lighting Retrofits (\$107,120) consist of installation of T8 Lamps and electronic ballasts, LED exit signs, replacement of 400-watt high intensity discharge lamps with 300-watt HID lamps, compact florescent lamps vs. incandescent lamps and occupancy sensors at targeted locations. Annual savings are estimated at \$60,358 per year.

Control Installations (\$234,840) consist of Web based wireless control of key mechanical systems to allow automatic run time scheduling, phased start up to avoid peak demand utility penalty charges, remote access and run time history reporting. Annual savings are estimated at \$70,493 per year.

Motor Replacements (\$43,260) consist of replacing 20 horsepower or larger motors, with 95 percent (or even higher efficiency) efficiency optimizing units for pool pumps and air handling units. Annual savings are estimated at \$16,068 per year.

3. Renewable Energy Solutions

a. Wind Energy Purchase

The county purchased 5.8 million kWh of wind energy in 2005 from Washington Gas Energy Services/Community Energy/Mountaineer Wind Farm in West Virginia, bringing a reduction of 6.2 million pounds of CO₂ in the two-year contract. Fairfax County will continue the commitment of purchasing five percent of the general county's energy from wind in 2007 and expand to 7.5 percent and 10 percent of the general county usage in 2008 and 2009, respectively. The new three year contract will bring a further reduction of 23,600 metric tons of CO₂.

b. Waste-to-Energy

The county has adopted a waste-to-energy approach, recovering methane, controlling nitrous oxide and generating electricity from solid waste. Methane traps 21 times more heat per molecule than CO₂, and nitrous oxide absorbs 310 times more heat. The waste-to-energy plant at the I-95 Landfill generates over 80MW of electricity, offsetting an estimated 1,000,000 tons (approximately) of CO₂ emissions that would have been generated by a conventional power plant of this size.

c. Land Fill Gas Recovery and Utilization

The county is in the process of using landfill gas generated by the closed I-66 Sanitary Landfill as a fuel source to heat county buildings on the West Ox Campus. In particular, the new Department of Vehicle Services Maintenance Garage has radiant heaters that can be easily converted to burn landfill gas, as was done for the truck wash at the I-66 Transfer Station and for the maintenance shop at the I-95 Landfill. In 2005, the county began the Phase 1 planning and design for the project. Construction of the necessary infrastructure to use LFG from the I-66 complex (closed landfill) as a source of renewable energy to heat the buildings mentioned above is being accomplished in Phase 2, which is to be completed in 2008. The total project cost is approximately \$300,000, and will provide estimated annual savings of \$70,000 per year in reduced natural gas consumption. The LFG pipeline would run approximately 2,500 feet from the existing flare station to the garage, requiring 4" high density polyethylene pipe to transmit the gas. Approximately 150-200 standard cubic feet per minute of LFG will be required to heat the garage. In addition, LFG is used at I-95 to generate six MW of electricity which is sold to Dominion Energy, and also as the fuel for sludge processing at Norman M. Cole, Jr. Wastewater Treatment Plant.

4. Green Vehicle Solutions**a. Hybrid Vehicle Replacement Program**

The county's vehicle fleet currently has 104 hybrid vehicles: 55 Toyota Priuses and 49 Ford Escape hybrids. The county plans to continue its hybrid vehicle replacement program in 2008 at a reduced pace due to budget constraints. Over the last three years, the fuel savings from the use of hybrids amounted to 37,460 gallons of unleaded gas, which equates to a savings of 363 tons of CO₂ emissions. In 2006, the county converted one of its Priuses to a "plug-in-hybrid-electric" vehicle. This car travels up to 30 miles on electric power from the grid before engine-generated electrical power is used. It achieves fuel efficiency on some trips of over 100 miles per gallon of gas, plus grid electricity at an equivalent cost of about 75 cents

per gallon of regular gas as compared to over \$3.50 per gallon of regular gas for a similar non-hybrid vehicle. The county is also pursuing grant funds to complete projects for a plug-in-hybrid-electric school bus and a hybrid delivery truck. We expect that the school bus would achieve a 40 percent decrease in diesel fuel consumption and the truck a 25 percent decrease with corresponding decreases in greenhouse gas emissions.

b. Diesel Exhaust Retrofits

The county has retrofitted 1,012 school buses, 167 Connector buses, and 113 heavy duty trucks with exhaust after-treatments that reduce particulate emissions. The bus retrofits include 436 school buses and 57 Connector buses with treatments that also reduce nitrogen oxides (a precursor to the formation of smog). These retrofits also indirectly benefit greenhouse gas reduction. In addition, Fairfax County Public Schools purchased 147 school buses with the reduced emissions engine control.

c. Idle shutoff and horsepower reduction

All county solid waste trucks and all Fairfax Connector buses have automatic idle shutdown programmed into their engine controls. In addition, the engines on 25 Connector buses have been de-rated by 25 horsepower to reduce fuel consumption and corresponding emissions of regulated pollutants and greenhouse gases by five percent for affected buses.

B. NATIONAL RECOGNITION FOR COUNTY EFFORTS

Fairfax County has received national recognition for many of its efforts, including the following:

- In 2008, the county received the 2007-2008 PTI Technology Solutions Award for Sustainability from the Public Technology Institute for its Plug-In Hybrid Vehicle Fleet Trial.
- In 2007, the county was recognized as a Green Power Partner by the U.S. Environmental Protection Agency for efforts to reduce the risk of climate change through green power purchasing.
- In 2007, the county joined the U.S. Environmental Protection Agency's ENERGY STAR[®] Challenge program.
- In 2006, the county received a National Association of Counties Achievement Award for Environmental Excellence for the Board of Supervisors' Environmental Agenda ("A 20-Year Vision") and for the Environmental Improvement Program.

- In 2006, Fairfax County was first among large counties in the National Association of Counties Change a Light Campaign, a two-month nationwide campaign challenging county employees to change incandescent bulbs with compact florescent bulbs.
- In 2005, the county received recognition as the U.S. Environmental Protection Agency Landfill Methane Outreach Program Community Partner of the Year Award for use of landfill gas as a renewable energy source, saving the county \$5,000 a year in fuel.
- In 2005, the county received a National Association of Counties Achievement Award for “Improving Air Quality in the Washington Metropolitan Region, a Commitment to Air Quality Excellence - Air Quality Protection Strategy”.

C. COMMENT

1. According to a presentation given at the June 11, 2007 Board of Supervisors’ Environmental Committee meeting, the Facilities Management Department cost avoidance since 2001 for electricity is well over \$3 million with part-time efforts. For example, one energy project performed by part-time efforts of one staff resulted in a cost avoidance of approximately \$83,000 annually at the Government Center (variable frequency drives, lighting retrofits and lighting software upgrades).

EQAC commends the county for its past efforts and looks forward to working with the county in the future on its climate change program.

D. RECOMMENDATION

1. In 2007 EQAC recommended that the county hire an Energy Coordinator who will coordinate efforts among a number of county agencies to build coordinated, cross-agency efforts to enhance energy conservation and efficiency. The position would also provide an initial point of focus to support implementation of energy conservation practices in the county. A Countywide Energy Coordinator would serve as a central conduit of information to and from agencies and the community to better understand and leverage energy conservation practices employed, and lessons learned. This position would act as the county’s expert on all matters pertaining to energy efficiency and renewable energy and work closely and collaboratively with the Environmental Coordinator and other agencies as required. At the direction of the Board of Supervisors, the County Executive included within the fiscal year 2009 advertised budget the Energy Coordinator position. In April 2008 the Board of

Supervisors adopted the fiscal year 2009 budget with the Energy Coordinator position authorized in the budget. The position was to be established through the abolishment of a vacant assistant to the County Executive position. In May 2008, the Human Resources department recommended that the grade for the position be established as an S-30. The position is in the process of being incorporated and established within the County. EQAC continues to support the hiring of an Energy Coordinator for Fairfax County.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER II

**LAND USE AND
TRANSPORTATION**

II. LAND USE AND TRANSPORTATION

A. ISSUES AND OVERVIEW

This chapter considers the environmental aspects of land use and transportation, both separately and as they relate to each other from an environmental perspective. According to the Fairfax County Comprehensive Plan, “If current trends continue, the supply of land presently planned for residential development will be all but exhausted shortly after the turn of the century [2000].”¹ As the county approaches this “buildout,” the focus of land use across the county is shifting from new development to revitalization and redevelopment. Each acre in the county becomes more valuable every day. The desire to maximize land utilization or productivity puts a strain on all types of land, from residential to commercial to parkland.

While the amount of available land has decreased, the Plan potential has been increasing. The potential is the number of units that can be built in the county according to the current Plan. It changes as requests are evaluated and adopted by the board. Since 1989, there have been over 80,585 new townhouses and multifamily units added and 927 single family homes removed from the Plan. This clearly demonstrates the increased intensity planned for the county.

At the same time, transportation systems across the county and metropolitan region are becoming increasingly congested. During rush hour, most highways in the county receive a failing grade for peak hour level of service. Over the past 15 years, highway construction in the Washington area outpaced population growth², yet congestion has still increased. This is due to increased per capita vehicle mileage that puts severe strains on the transportation infrastructure. According to the Texas Transportation Initiative, our region is the second most congested in the country. In 1982 the average metropolitan resident spent 16 hours in congestion, by 2005 that ballooned to 60 hours wasted in congestion. That can be translated into roughly \$2,331,000,000 of lost productivity and wasted fuel.³

Public transportation systems are becoming increasingly important to the county and region. Metrorail is the second largest rail transit system and Metrobus is the fifth largest bus network in the nation. Every day Metro carries nearly 20 percent of all rush-hour trips in the metropolitan area, carrying as many people each day as 1,400 miles of new traffic lanes — equivalent to an 11 percent expansion of the region’s road system. From a purely environmental standpoint, Metrorail and Metrobus eliminate more than 10,000 tons of pollution each year and save the

¹ Fairfax County Comprehensive Plan, 2003 Edition, Land Use Chapter

² “Where We are Growing”, Southern Environmental Law Center, 2002

³ Texas Transportation Initiative, 2007 Urban Mobility Study

region from using 75 million gallons of gasoline each year.⁴ Public transit is clearly an important part of the future.

The buildout of the county's land use plan combined with the overload of the transportation infrastructure will continue to increase as the county population increases. In 2006 the county released a comprehensive demographic study, *Anticipating the Future: A Discussion of Trends in Fairfax County*. The report presents much needed data to plan for the future and incorporate future population and trends. It clearly points out that higher density residential development in Fairfax County and its neighboring jurisdictions will increase traffic congestion. This density, however, will make public transportation alternatives more viable.

As noted throughout this Annual Report, pressures from growth throughout the county directly effect the environment and consequently affect the quality of life, health and natural experiences. The Comprehensive Plan specifically calls out strategies and patterns that can address land use and transportation together. Mixed-use development is an important tool to combine residential and commercial development to "enhance the sense of community" and to "increase transportation efficiency." It provides an opportunity for residents to live and work in the same area, thus reducing transportation needs while increasing the population density to support local businesses and mass transit.

The Board of Supervisors highlighted the effects of growth and congestion in its vision paper: **Environmental Excellence for Fairfax County, A 20-Year Vision**. A variety of tools were specifically called out, including mixed use development and Low Impact Development. In addition, problems that at first seem tangential to the environment, such as neighborhood disruption through tear-down development and low income housing, were raised. Teardowns are becoming more common across the county, as single family homes are replaced with larger homes. The lack of low-income housing means workers cannot afford to live and work in Fairfax County and need to commute from outside the county, which exacerbates problems of both pollution and congestion.

The county faces great challenges from the combined effect of:

- Land use constraints that result from reaching build-out and transitioning from a growth focus to redevelopment.
- Transportation systems strained by congestion and getting further constrained by sprawl beyond the county.
- Population growth that will require additional residential and commercial facilities and transportation options.

⁴ Washington Metropolitan Area Transit Authority, www.wmata.com/about/metro_matters/MMfactsheet.pdf

Due to a variety of reasons, land use and transportation decisions in the county have become separated. The county and individual landowners have primary authority for land use while the state has primary authority for transportation. The proposed HOT Lanes for the beltway introduce yet another wrinkle with a private corporation building a significant for-profit component to our infrastructure.

With increased population and density in the county, the two domains need to be brought closer together. Land use decisions directly affect transportation needs. Transportation systems enable people to move about but need to be deployed in relation to planned population centers.

By planning and learning from the past and from other communities, we can face these challenges and continue to have a high quality of life that includes a healthy environment with natural resources and experiences that are treasured by the county residents.

1. Trends and Concepts

Important concepts that begin to combine land use and transportation are sprawl, smart growth and new urbanism. Sprawl is the unrestricted growth out from the core of a city or a county. In the 1970s, Fairfax was one of the nation's fastest growing counties. Today that rapid growth is happening beyond Fairfax County, in Loudoun and Prince William counties. As of 2003, Loudoun County was the fastest growing county in the nation, averaging 12.6 percent growth per year. This outer county sprawl directly affects Fairfax County through increased road congestion, changing property values and inefficient use of Fairfax County's infrastructure.

Smart growth is the antithesis of sprawl; it can be defined as environmentally-sensitive land development with the goals of minimizing dependence on auto transportation, reducing air pollution and making infrastructure investments more efficient. The Coalition for Smarter Growth lists the following principles for Smart Growth:

- Mix land uses
- Take advantage of compact building design
- Create housing opportunities and choices
- Create walkable communities
- Foster distinctive, attractive communities with a strong sense of place
- Preserve open space, farmland, natural beauty and critical environmental areas
- Strengthen and direct development toward existing communities
- Provide a variety of transportation choices
- Make development decisions predictable, fair and cost-effective
- Encourage community and stakeholder collaboration in development decisions

Reston and the Orange Line corridor through Arlington are good examples of smart growth.

New Urbanism is a design movement that is going beyond smart growth into community building based on traditional urban centers. New Urbanists are working to improve land use by focusing on walkable communities and town centers.⁵ A walkable community reduces the distance between where people are and where they want to go.

An important New Urbanist concept to encourage consistent planned development in a community is called **Form Based Codes**. These codes define an appropriate form of development and provide incentives for developers to adopt them. They have been successfully adopted as part of the Columbia Pike revitalization in Arlington County. The community worked through a series of **charrettes** with a planning consultant to create a vision for the new “pike.” Form Based Codes provide clear direction on the adopted vision, while incentives encourage developers to adopt the form as the Pike is redeveloped. In particular, developers who follow the codes have an expedited review and approval process.

Infill is the process of filling in larger lots with multiple or larger housing and is a key component to reducing urban sprawl.⁶ Infill development can provide new housing or commercial development on vacant or underutilized sites within developed areas, taking advantage of existing infrastructure. While infill provides increased land utilization, it also has the potential to increase the environmental impact upon the infilled community. Particular concern should be paid to the impacts of infill, such as increased stormwater runoff due to additional impervious surface and loss of tree canopy.

Transit Oriented Development or Design is another approach to creating walkable, livable communities. TOD encourages increased multi-use density around transit centers. The goal of TOD is to promote walking, biking or transit as a means of getting to work or the store instead of by car. By focusing development around transit centers, ideally communities will have increased transit ridership, less traffic, reduced pollution and a better quality of life.

Transportation Demand Management is typically associated with a TOD proposal. TDM is a plan to reduce automobile trips that cause congestion. Some elements of a TDM plan include easier and safer pedestrian access, local amenities, and shuttle service.

Other concepts that combine land use and transportation provide less dramatic changes to traditional subdivision development. **Clustering** provides residential

⁵ Charter of the New Urbanism at: <http://www.cnu.org/about/index.cfm>.

⁶ Greenbelt Alliance, [Smart Infill: Creating More Livable Communities in the Bay Area](http://www.greenbelt.org/downloads/resources/report_smartinfill.pdf), at http://www.greenbelt.org/downloads/resources/report_smartinfill.pdf

development that allows homes to be built close together with the remaining acreage left as open space in perpetuity. Generally, homes are sited on smaller lots, with the remaining land dedicated to open space. In most cases, the density of homes in a cluster development is the same as what would have been built on the entire site; the development is just configured differently. The challenge with clustering is the lack of public trust that the open space will remain open.

Low Impact Development is an approach that reduces the impact of development on a site. The goal of LID is to better integrate the natural environment with the built environment. LID techniques are intended to mimic an area's natural hydrology to manage stormwater on site, thereby reducing adverse downstream impacts.⁷ For example, LID will reduce the amount of impervious surface on a site and reduce the amount of stormwater runoff leaving the site. LID tends to be relatively economical and is flexible enough to be applied to different types of landscapes.

Green Building is another approach to lowering the impact of development by designing structures to conserve resources and using technology that is more efficient. Green roofs can be built with succulent plant gardens that absorb water during rain storms and gradually release it back to dramatically reduce runoff and stream pollution. The county has installed one such roof at the Providence District office to demonstrate feasibility, and a very successful and attractive green roof has been installed at the Yorktowne Square Condominiums⁸ in Merrifield. Highly efficient and solar energy systems also minimize the environmental impact.

High Occupancy Toll Lanes are a tool to ease traffic congestion in urban areas. The idea behind HOT lanes is to open High Occupancy Vehicle lanes up to single occupant vehicles that pay a toll. The price of the toll varies, depending on the time of day and amount of traffic. An additional benefit of HOT lanes is that they can provide additional revenue to pay for other transportation improvements.⁹

2. Macro Considerations

Many decisions in the county that affect land use and transportation are made on a micro level. That is, they affect a single parcel or neighborhood. The macro effect of many small changes has a great impact on the county environment. These macro consequences are lost in the day-to-day planning and construction that happens across the county. As higher densities and infill occur, their effect is cumulative and significant. For example:

⁷ Low Impact Development Center at: <http://www.lid-stormwater.net/intro/background.htm>

⁸ <http://www.fairfaxcounty.gov/nvswcd/newsletter/greenroof.htm>

⁹ U.S. Department of Transportation, Federal Highway Administration, [A Guide for Hot Lane Development at http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/13668.html](http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/13668.html)

- Small neighborhoods with a stable environmental footprint are being transformed with larger houses. These newer houses bring additional impervious surface through larger roofs and additional pavement. They also displace trees that protect the parcel with a green canopy and provide haven for birds and wildlife. While the effect of a single home is small, the macro effect on community channels more runoff and pollution into the watershed, increases the ambient temperature and displaces wildlife.
- Large scale development, such as the Tysons Corner Urban Center and other Suburban Centers, bring additional residential density to a region. This induces disproportionate transportation needs that can lead to congestion and the associated increase in air pollution and vehicular waste.

a. Understanding Macro Changes

These macro effects are going to become more pronounced with the county build out and change from development to redevelopment. The infrastructure to sufficiently understand and model their effects is lacking across the county systems. Up to now, regional aggregations and averages were sufficient to predict development impacts. The Concept Map for Future Development has done a good job guiding decisions and projecting impact at a broad macro level. Moving into the future, tools are necessary to provide a finer resolution of real time changes that can be quickly aggregated into a macro view.

These new tools should combine the county GIS capability with the existing planning and zoning databases. The data are readily available at a parcel level, but the ability to view the data and use the data to model macro effects is not possible. Understanding and modeling the macro changes happening across the county will help provide insight to the Board of Supervisors and Planning Commission as they deal with micro decisions.

b. Creative approaches

The county also needs to consider creative approaches to address these macro effects. One way to avoid macro consequences is to reduce the impact of micro decisions. For example:

- Modifying the Public Facilities Ordinance to encourage Low Impact Development can protect streams and mitigate the micro impact of infill development.

- Providing incentives for Green Building can protect streams and decrease heat generation from asphalt roofs. This encouragement will be a win-win for the county and for developers.
- High density development should have an effective Transportation Demand Management plan. This should be part of any submission and include future monitoring with options in case the plan deviates from reality. The recent Plan Amendment for Fairlee/Metro West includes TDM as an important element of the development plan.

Planning for large scale redevelopment, such as county Urban and Suburban Centers, has been a useful forum to consider macro effects. These task forces grapple with all aspects of the Urban and Suburban centers, including land-use, transportation and environmental impact. The residential commitment and input to these studies is commendable. They provide a long range vision and plan in harmony with the community vision. These studies and reports complement the Area Plan Review process that focuses on micro changes to the comprehensive plan.

The focus on **Transit Oriented Development**, especially at Metrorail stations and future stations along the Dulles Rail corridor and Tysons Corner, maximizes the county investment in multi-modal transportation. The Board of Supervisors-appointed Tysons Land Use Task Force has a very ambitious charge to consider the redevelopment of the “Downtown” for Fairfax County. The county has a significant interest in getting Tysons Corner right. Such a large project will demand better tools to envision, model and explain the plan to residents and business owners. It will require substantial community outreach and participation. It will need to be codified into a workable Comprehensive Plan amendment that encourages and monitors the vision. And it will require better macro management and mitigation of changes to this important region.

c. Non-obvious Macro Considerations

The sections above focus on changes caused by development and redevelopment. There are also macro effects generated by non-development changes, such as work patterns, mixed use opportunities and economic considerations that effect the county environment.

Telecommuting, or **telework**, reduces or eliminates the traditional commute to the office. Teleworkers work from home or at local work centers that provide infrastructure for a community of workers. This reduces pressure on the transportation network without building physical infrastructure. The county has an aggressive telework program in place for county employees.

Mixed use development brings work, play and home closer together, reducing the distance for trips and commutes. Mixed use is proliferating across the county, providing economic growth with less congestion than traditional separated communities.

Economic factors, such as increasing property values, also affect the overall county environment. Low-income residents are struggling to find affordable housing near their jobs in the county and frequently choose to live outside the county. This negatively impacts the transportation system. As property values rise, homeowners choose to expand their residences rather than relocate, which changes the impervious nature of communities.

The Board of Supervisors has specifically raised affordable housing and infill development as an environmental concern in their Environmental Vision.

Macro considerations need to be better understood and modeled as the county increases in density. Traditional models did not need to consider macro changes, and the resolution and quality of data is insufficient for planning and protecting the environment. Dealing with the proliferation of small changes across the county will take creative approaches using all available tools, including the Comprehensive Plan, the Public Facilities Manual, special ordinances and public outreach.

B. TECHNOLOGY TO UNDERSTAND THE COUNTY

Fairfax County has created an impressive Information Technology infrastructure to help understand the county and the 395 square miles of land it contains. The Geographic Information System provides a capability to “see” the county through maps, imagery and other geospatial data. GIS is a technology that allows the county to visualize relationships between data that may not be apparent by merely looking at a map. The GIS system has received numerous awards for expanding public access the geospatial data and leveraging that data to enhance productivity. EQAC commends the county for making the investments in IT and GIS that are paying dividends in increased productivity and visibility.

Through work with the county’s Department of Information Technology, EQAC has become more familiar with capabilities and possibilities for using technology. There are three attributes that must be in place for the technology to be effective:

- The GIS capability—these are the technical systems that move, manipulate and display information based on geographic location. It also includes staff familiar with the systems. The county IT and GIS staff are experts on this technology.

- Data that are geographically located, in other words, spatial data—this is an expensive component that needs to be constantly updated as the county changes. There are many sources of data, from aerial imagery to U.S. census data to county records that need to be transformed into useable information.
- Models and applications that can use the data to prepare for future scenarios and visualization tools to help with decision making—these are becoming increasingly important.

Over the past several years, EQAC has advocated for an enhanced IT capability for tracking land use. Our original recommendations evolved into a comprehensive system to track land use changes at a parcel level. This new system is called the Integrated Parcel Lifecycle System and has had a transformative effect across the county. Many agencies work on parcels for a particular period, but IPLS allows that full lifecycle to be captured across agencies. Layering these data on the GIS system allows for a visualization of how land in the county is used and how it changes over time.

1. Integrated Parcel Lifecycle System

The IPLS System is in production and staff has been doing outreach to train users across agencies on how to leverage the capability. The main transformation is that IPLS provides users with relevant data that can be used for analysis. Prior systems would produce a report that summarized the data. This opens new possibilities for understanding and innovating with information.

The current parcel data include:

- Housing Units
- Population
- Gross Floor Area
- Households
- Housing Value
- Residential Development

All data are spatially enabled and can be analyzed with the GIS tools.

This information managed by IPLS is used by the county to help determine services and service provision levels, respond to state and federal reporting requirements and respond to regional initiatives such as transportation planning, air quality modeling and other programs of regional significance. One example of the increased resolution the system provides is enhanced demographic forecasts that take advantage of parcel characteristics such as age of structure, location, steepness and other features. County staff can evaluate 30 year demographic forecasts including low, high, and “most likely” estimates. Staff is also able to produce reports in a GIS environment using user defined

geographies. Reports can be generated for population density, population forecasts, housing starts and completions, vacant land and underutilized land.

The uses of these data clearly go beyond the scope of EQAC but illustrate the interconnectedness of the systems. EQAC's recommendation was narrowly focused on improving the county's land use planning capability to enable better integration of land use and transportation. It turns out that many other organizations and departments also benefit from this capability.

EQAC commends the Department of Systems Management for Human Services for its leadership and advocacy on the IPLS. EQAC also congratulates the department on receiving a GIS Excellence Award for the Best GIS Integration or Application Development Agency.

The IPLS system replaced the older Urban Development Information System that captured land use data relevant as the county was urbanizing from 1970 to the present. Every parcel in UDIS would be clearly delineated into Residential, Industrial, Commercial or Public use. The IPLS system can track data at a more granular level and quickly generate reports. However this granularity highlights the fact that the UDIS categories are no longer appropriate, especially as the county adopts more transit-oriented designs that incorporate mixed use development. Parcels in a mixed use development cross categories and parcels with multiple stories of mixed use further complicate simple analyses.

With IPLS in place, the county needs to develop an updated reporting methodology to accurately reflect the land use across the county. IPLS provides a base to analyze parcel information, but there is a considerable task remaining to synthesize that information and turn it into useful land use reports.

2. Data

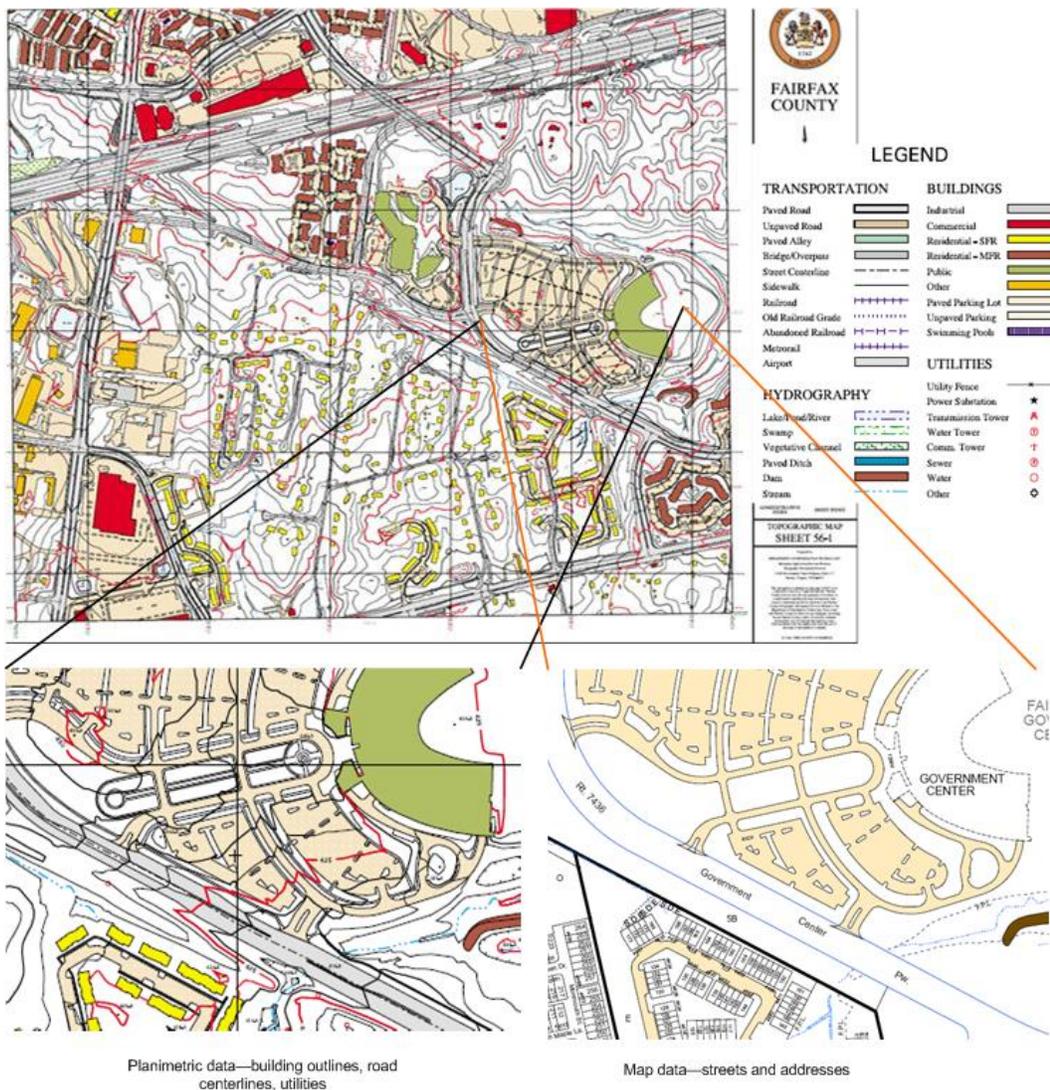
The GIS systems are only as reliable as the data they process. The county has acquired significant data and maintains these data on a regular basis. Prior EQAC recommendations focused on enhancing different types of data in particular:

- Planimetric data—features you can see, such as buildings, driveways, pools, railroads, ponds, trees
- Oblique imagery—creating three-dimensional images and incorporating them into the planning process
- Natural Resource data – identification of resources that should be considered during environmental and conservation planning efforts

a. Planimetric Data

Planimetric data are the features that can be seen. These data typically come from an aerial image or photograph of the county. The image is analyzed by a specialized contractor to extract features for the GIS system. The current planimetric database was created from imagery gathered in 1997. The following GIS pictures show a map around the county's Government Center with planimetric data and a blowup of some types of information it portrays. It is contrasted with a normal map that has streets and addresses. The planimetric data show the reality of the building outlines and the actual road path. It correlates the data on the map with the actual data and adds additional information not shown on a map.

**Figure II-1. Planimetric Information—
Fairfax County Government Center**



The county is planning another round of planimetric data gathering and is considering adding additional feature extraction to include driveways, sidewalks, pools, patios, decks, sheds and tennis courts. These impervious surfaces are of interest in modeling the effects of property improvements and calculating the effects that increasing small scale imperviousness have on a macro level.

b. Oblique Imagery

Oblique imagery is taken from an aircraft at an angle rather than straight down. The images can then be processed by software to show the sides of buildings and structures and measure their heights. The primary users of the oblique imagery are agencies such as the Department of Public Works, the Department of Tax Administration and public safety agencies to reduce field time in assessing and planning. The image below is a sample oblique image of the Government Center:

Figure II-2: Oblique Imagery—Fairfax County Government Center



EQAC believes this imagery will prove very useful in land use and transportation planning. It begins to enable three-dimensional models and can have wide applicability beyond the county operations to public participation. In particular, the Area Plan Review process can benefit from better understanding three-dimensional areas around sites subject to proposed amendments.

Looking into the future, it is possible to begin accepting Land-Use proposals with three-dimensional Computer-Aided Design and Drafting data. The CADD models can be combined with oblique data to provide accurate 3D representations of the changes. In effect the county can begin examining proposals using fly-through technology overlaid on ground truth. This will be much more illustrative than artistic interpretations.

The county has oblique imagery collection in the current IT plan. EQAC recommends that the county continue to gather these data and to expand the use of 3D analysis in planning.

c. Natural Resource Data

In 2006, county staff began a series of discussions to determine which agencies currently possess ecological data and whether or not other agencies could utilize various ecological data as a shared resource. These data include Resource Protection Areas, wetlands, vegetative communities, hydric soils, tree cover and open space as well as archaeological and cultural resources. The Park Authority has spearheaded the effort to identify data resources and to develop analysis models to evaluate these data. Once appropriate models and protocols have been developed, they may be used in the future to identify areas that could be targeted for conservation or protection. Currently, the final product of this endeavor is envisioned as a model that will allow county staff to evaluate ecological resources. Also included will be a detailed report listing data sources needed and a plan to consolidate these data and recommendations on the applicability and appropriateness of the model and its limitations.

3. Models and Visualization

While the GIS system and new data provide valuable insight by which to view the county, they do not necessarily provide new information about the county. Models are computer programs that analyze the data and create reports or projections. The county regularly uses transportation and traffic models to analyze congestion. Some of this information is reviewed in this chapter. As the data warehouse expands, it becomes important to use models to comb through the data and extract information that would otherwise be unattainable.

EQAC realizes that models are complicated and expensive. EQAC recommends that the county begin exploring and evaluating GIS models.

In addition, EQAC recommends that the county leverage its data holdings with new visualization tools. This could be especially relevant for task forces, such as the Area Plan Reviews in each district. It is very difficult for the public to visualize amendments, and the county has data that can greatly assist the public.

C. LAND USE

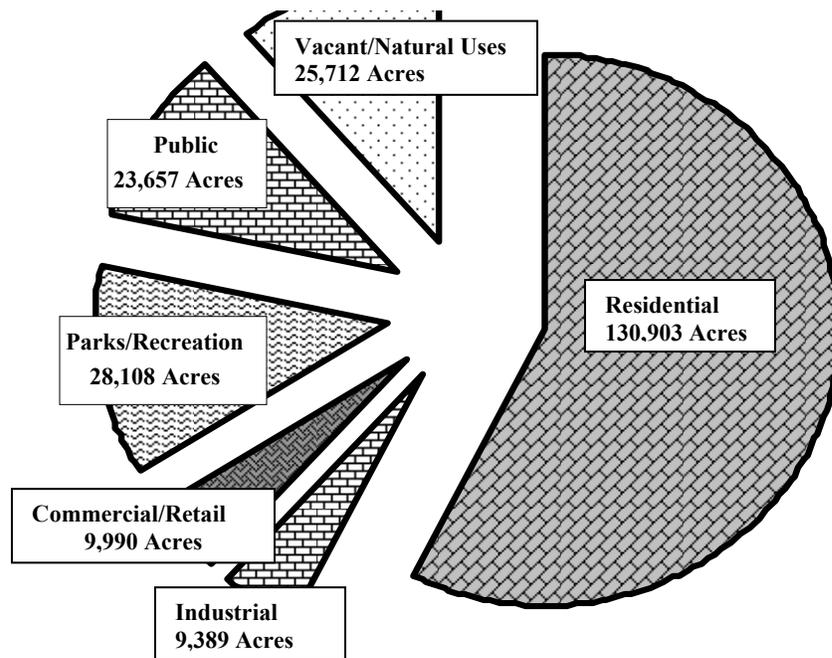
A prerequisite to understanding the interrelationship between land use and transportation is to first examine them separately. This section describes land use and land use decision-making in Fairfax County.

1. How Is Land Used In Fairfax County?

Prior to the IPLS system, land use in the county had been analyzed yearly via the Urban Development Information System. This section presents information from the 2004 UDIS report. EQAC recommends that a new methodology be created using categories that are relevant for a more urban environment that is undergoing redevelopment.

Fairfax County has 227,751 total acres of land, excluding areas in roads, water or small areas of land unable to be zoned or developed. Those acres are organized into the following broad categories:

Figure II-3: Existing Land Uses in Fairfax County



Source: Fairfax County Department of Systems Management for Human Services, 2004.
 Note: Land in Towns of Clifton, Herndon and Vienna included. Total acreage figures do not include areas in roads, water or small areas of land unable to be zoned or developed.

- Residential—acres dedicated to living. Residential acres are measured by the number of dwelling units per acre. For example, a low-density

neighborhood has a DU/AC from .1 to .5, a suburban neighborhood ranges from 1-20 and an urban center has a core DU/AC of 35-60.

- Commercial/Retail—acres developed for people to work or shop. Commercial space is measured by looking at the Floor Area Ratio, which is the ratio of gross floor area to the size of the lot. For example, an FAR of 0.5 means that a single story building can cover half the lot, a two-story building can cover 1/4 of the lot and a four-story building can cover 1/8 of the lot. FAR does not include other impervious surfaces, such as parking lots.
- Industrial—acres zoned for industrial use. Industrial space is measured by FAR.
- Parks and Recreation—acres dedicated to public enjoyment and recreation
- Public—acres owned by the public but not for parks or recreation. This includes: Fort Belvoir; Dulles Airport; the campus of George Mason University; county government facilities such as fire stations, landfills, police stations, training facilities, schools and government centers; and other publicly-owned properties.
- Vacant—acres currently unused, either natural or vacant, but zoned for Residential, Industrial or Commercial uses

2. Land Use Planning

The Fairfax County Comprehensive Plan is a guide for making land use decisions in Fairfax County. Major Plan revisions took place in 1975 and 1991. The 1991 Plan, that is the foundation for the current 2003 edition, was developed around 18 Goals for Fairfax County (a 19th goal was added later). The 2003 Edition consists of the Policy Plan plus the Area Plan for each of the four planning areas. The Policy Plan has ten functional sections plus a Chesapeake Bay Supplement. The functional sections are: Land Use, Transportation, Housing, Environment, Human Services, Public Facilities, Parks and Recreation, Revitalization, Economic Development and Heritage Resources.

a. Concept Map for Future Development

In 1990, the county's Concept Map for Future Development was developed. This map identified 31 mixed-use centers; the Concept Map has been revised slightly since then, but there are still 31 mixed-use centers shown (Figure II-4). While the Concept Map was not formally adopted, it is an integral part of the Area Plans.

In 1995, a study of the Plan was prepared entitled: State of the Plan, An Evaluation of Comprehensive Plan Activities Between 1990-1995 with an Assessment of Impacts Through 2010. This study outlined a series of recommendations for the county to improve its ability to meet the Plan goals. Many of those recommendations are still applicable.

Currently, the Policy Plan is reviewed by functional sections. The Parks and Recreation section was reviewed in 2003. The Transportation Section was reviewed in 2005 with recommendations presented in 2006. A comprehensive review of the complete Policy Plan is not anticipated in the future due to the overall complexity of the complete document.

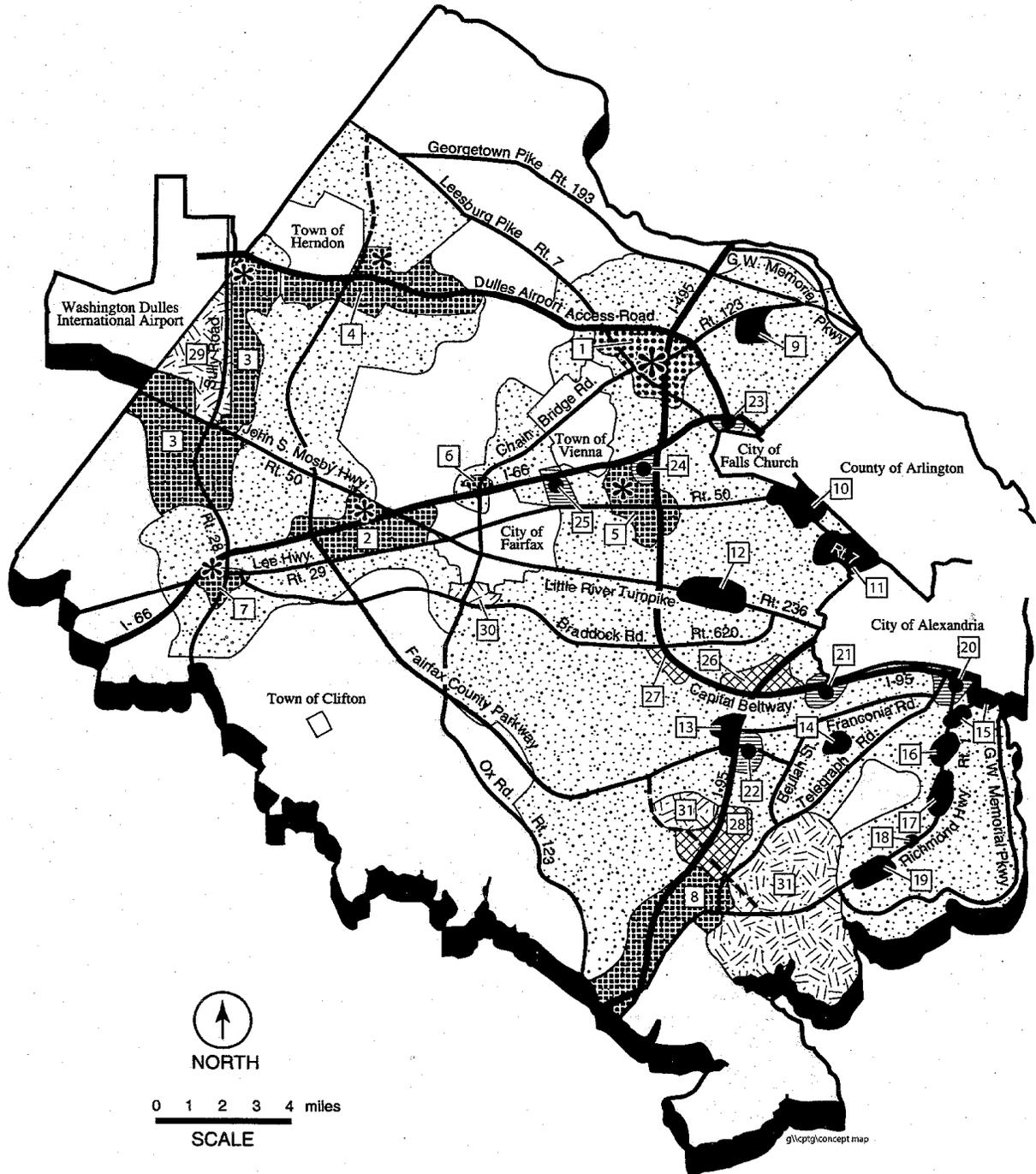
b. Area Plan Review

The Area Plans Review process is a community-wide review of site specific changes proposed to the Area Plan volumes of the Comprehensive Plan. The APR process is organized by the Supervisor Districts. The northern portion of the county, which includes Dranesville, Hunter Mill, Providence and Sully districts, was reviewed in 2004-2005. The southern portion, which includes Braddock, Lee, Mason, Mount Vernon and Springfield districts, was reviewed in 2005-2006.

The APR task force for each district is appointed by the district supervisor. Each task force reviews proposed changes at a public hearing and submits a recommendation to the Planning Commission. This is accompanied by a staff recommendation that may or may not concur with the task force recommendation.

The North County APR process is about to commence. APR nominations span the county. Whereas the plans for Urban, Suburban, and Transit Stations are comprehensive in scope, the APR nominations are opportunistic. Each nomination is analyzed thoroughly by staff to consider factors such as impact on transportation, education, and environmental resources of the individual nominations. The cumulative effect, however, is not analyzed. Such a concern was the motivation to defer nominations in Tysons Corner and appoint a task force to look at comprehensive changes.

Figure II-4: Concept Map for Future Development



CONCEPT MAP FOR FUTURE DEVELOPMENT

CONCEPT MAP FOR FUTURE DEVELOPMENT

LOCATIONS OF MIXED-USE CENTERS

Urban Center

1. Tysons Corner Urban Center

Suburban Centers

2. Fairfax Center
3. Dulles (Route 28 Corridor)
4. Reston-Herndon
5. Merrifield
6. Flint Hill
7. Centreville
8. Lorton-South Route 1

Community Business Centers

9. McLean
10. Seven Corners
11. Baileys Crossroads
12. Annandale
13. Springfield (West)
14. Kingstowne
15. North Gateway and Penn Daw
16. Beacon/Groveton
17. Hybla Valley/Gum Springs
18. South County Center
19. Woodlawn

Transit Station Areas

20. Huntington Metro Station
21. Van Dom Metro Station
22. Franconia/Springfield Metro Station
23. West Falls Church Metro Station
24. Dunn Loring Metro Station
25. Vienna Metro Station

LOCATIONS OF LARGE INSTITUTIONAL AND INDUSTRIAL AREAS

Industrial Areas

26. Beltway South
27. Ravensworth
28. I-95 Corridor

Large Institutional Land Areas

29. Washington Dulles International Airport
30. George Mason University
31. Fort Belvoir (Main Post and Engineer Proving Ground)

LEGEND

 Suburban Neighborhoods
(Residential density ranges defined in Area Plans; 0.15-0.25 FAR* for neighborhood-serving non-residential use)

 Low Density Residential Areas
(Residential density of 0.1 to 0.5 du/ac **, specific density ranges in Area Plan; Non-residential use intensity 0.05 to 0.1 FAR)

 Tysons Corner Urban Center
Core (1.0-1.65 FAR; 35-60 du/ac)
Non-Core (0.25-1.0 FAR; 8-45 du/ac)

 Suburban Centers
Core (0.3-0.8 FAR; 15-35 du/ac)
Non-Core (0.15-0.30 FAR; 5-25 du/ac)

 Community Business Centers
(0.20-0.50 FAR; 5-25 du/ac; if a core is designated, intensities of up to 0.70 FAR may be allowed)

 Transit Station Areas
(0.30-1.00 FAR; 8-45 du/ac)

 Industrial Areas
(0.25-0.50 FAR for Industrial Uses)

 Large Institutional Land Areas

* FAR - floor area ratio
** du/ac - dwelling units per acre

c. Lee District Planning Process

The Lee District planning process is a unique review process that has been in place since 1976. This interjects a step before the public hearing at the Fairfax County Planning Commission. All land use cases (rezonings, special exceptions, and changes to the Master Plan) are presented to the Lee District Land Use Advisory Committee. The committee asks questions, makes comments, etc. When all the information is available, the committee votes to either recommend approval or denial of the application. The Lee District Planning Commissioner participates in these meeting and typically supports the committee decision at the Planning Commission public hearing.

d. Chesapeake Bay Preservation Ordinance

Another important ordinance that affects land use is the county's Chesapeake Bay Preservation Ordinance. Amendments to this Ordinance were adopted on November 18, 2003 by the Board of Supervisors. This Ordinance codifies the county commitment to protect the Chesapeake Bay. An important aspect is the designation of Resource Protection Areas around all water bodies with perennial flow. RPAs are the corridors of environmentally sensitive land that lie alongside or near the shorelines of streams, rivers and other waterways. They include any land characterized by one or more of the following features:

- A tidal wetland
- A tidal shore
- A water body with perennial flow
- A non-tidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow
- A buffer area that includes any land within a major floodplain or any land within 100 feet of a feature listed in the four bullets above

The Chesapeake Bay Supplement, which was incorporated into the Policy Plan in 2004, provides an excellent overview of land use factors in Fairfax County that affect the Chesapeake Bay.

The Comprehensive Plan plus the Chesapeake Bay Preservation Ordinance provide an outline for how and where development is planned to occur in Fairfax County. They can be used to analyze the **potential** development that can occur within the county. The **realization** of that potential is subject to many external variables.

3. Land Use History and Buildout Projections

The Comprehensive Plan contains land use recommendations for all of the land in the county. When the concept plan was conceived in 1990 there was a

significant amount of vacant land so it could address changes across the county. That vacant land has been steadily decreasing as shown in Table II-1. In 2004, with only approximately 11 percent vacant and much of that fragmented, the decisions are much more constrained. Significant planning changes require decisions that will most likely affect existing developed land.

Table II-1 Vacant Land in Fairfax County			
Year	Vacant Land (acres)	Total Planned Land (acres)	Percent Vacant
1980	75,550	234,744	32.2 percent
1985	66,685	232,941	29.2 percent
1990	45,042	230,678	19.5 percent
1995	37,006	229,366	16.1 percent
2000	29,529	228,541	12.9 percent
2004	24,307	227,751	10.7 percent
Planned land does not generally include public roads and water			
Source: Fairfax County Demographic Reports, 2004			

The current land use categories are shown in Table II-2 below. Currently, 57.5 percent of the county land is developed for residential use, with 4.4 percent for commercial. These numbers show the land devoted to each use type, but they do not show the corresponding density. Commercial/Retail acreage in the county has a higher density than residential. It is difficult to determine the footprint of mixed-use acreage given the current data. It is also difficult to determine mixed-use density and whether it is a function of DU/AC or FAR, or both.

Table II-2 Existing Land Uses		
Land by existing use	Acreage	Percent of Total
Residential	130,903	57.5 percent
Industrial	9,389	4.1 percent
Commercial	9,990	4.4 percent
Parks and Recreation	28,108	12.3 percent
Public	23,657	10.4 percent
Vacant & Natural	25,712	11.3 percent
Total	227,759*	100.0 percent
*Does not generally include public roads and water		
Source: Fairfax County Demographic Reports 2004		

As the current Plan is exercised and the county reaches build-out, the planned land use acreage will certainly increase. All vacant and natural land will be developed or become parkland. The ratios between the types will also change.

4. Plan Density Increases

The aggregate acreage available in the county is relatively constant, with occasional changes as land is converted to other uses, such as roads and drainage ponds. The Comprehensive Plan capacity, however, is constantly increasing as new density is allocated across the county.

The Comprehensive Plan is not a static document; major revisions to the Area Plans were adopted in 1991, and the Plan has been amended numerous times, both through the Area Plans Review process and through Plan amendments and land use studies authorized by the Board of Supervisors, since that time. As can be seen in Table II-3, the general effect of these Plan amendments has been to increase potential development in Fairfax County; the “buildout” levels of total residential and total nonresidential development under the scenario presented in Table II-3 have increased since 1991.

Table II-3				
Comprehensive Plan “Buildout” Capacity in Fairfax County Applying a Residential Plan Option Maximization Scenario				
Land Use	1989	1991	1995	2003
Nonresidential (figures given in square feet of floor space, rounded to the nearest million)				
Office	-	158,000,000	182, 000,000	185, 000,000
Retail	-	48, 000,000	56, 000,000	65, 000,000
Institutional	-	37, 000,000	42, 000,000	44, 000,000
Industrial	-	74, 000,000	75, 000,000	70, 000,000
Total Nonresidential	-	317,000,000	355,000,000	364,000,000
Residential (figures given in dwelling units, rounded to the nearest hundred)				
Single Family Detached	216,100	212,200	212,800	215,200
Single Family Attached (e.g., Townhouses)	78,600	82,700	86,200	88,900
Multifamily	83,200	114,400	140,600	153,500
Total Residential	377,900	409,300	439,600	457,600
Source: Fairfax County Department of Planning and Zoning, 2004				

5. Plan Density Trends

Informal observations show that the overall residential units are:

- Increasing in total number—as the population grows, Fairfax County is able to expand through Plan changes that increase the number of potential units.
- Getting closer—the trend is to add more multi-family units (an 84 percent increase since 1989) while maintaining a consistent number of single family detached homes.

The recent Tysons Corner Land Use Task Force recommendations also highlight the density increases. The proposed vision calls for increasing from 17,000 to 100,000 residents and from 120,000 to 200,000 jobs. This growth, which will all occur as redevelopment within an existing developed area, will be more complex than any other development in the county's history.

With that increasing density, the Tysons Corner plan provides a comprehensive urban vision that provides:

- 95 percent of all development within an easy walk of transit.
- A new transit oriented focus with public circulators and Metrorail stops.
- A jobs/housing balance of approximately 4.0 jobs per household.
- A sustainable Tysons with restored streams, new parks and green buildings

This vision highlights the need for new analysis techniques and models to better understand and prepare for future land-use decisions.

D. TRANSPORTATION

This section examines transportation and transportation decision making in Fairfax County.

1. How do People and Things Move About Fairfax County?

There are numerous options for people and things to move about the county.

- Private, motorized transportation is one of the most significant elements of transportation that has a major effect on the environment and is most closely related to land use and development. In modern times, people have become more reliant on the use of automobiles for business, pleasure and various daily functions and activities. The urban sprawl that has been experienced in Fairfax County has greatly influenced this problem, causing major congestion on roadways, particularly during

rush hour as many individuals are commuting long distances to and from their jobs.

- Rail and rapid bus transit has long been looked upon as a means of reducing traffic congestion and thereby creating a positive impact on pollution and air quality. It also has a direct relationship to land use planning and development because rail transport centers are ideal locations for business and housing developments. There are numerous projects that have long been in the planning phase; due primarily to budget constraints, however, virtually none of them have reached the actual development phase.
- Commercial vehicular transportation, mainly trucks and buses, are another serious factor impacting the environment. Trucks, whether they are local, inter-county or interstate, are serious contributors to the environmental crisis. In addition to many of them using “dirty” diesel fuel, they also have a negative impact on traffic congestion. Bus traffic includes school buses, most of which are transporting students during rush hour periods. Many of these buses are old and are a hazard to the environment, again because of the type of fuel they use.
- Non-motorized transportation opportunities, namely walking and biking, have been looked upon as viable alternatives for reducing traffic congestion and improving air quality. Not having sufficient infrastructure for walking and biking is a major deterrent to that form of transport, not to mention the frame of mind of the general public that has become automobile-dependent over the years, even for short trips. This component has an important relationship to land use planning and development in order to ensure that adequate facilities (walking and biking trails) are included in the plans.
- “Virtual transportation” has surfaced in recent years as another viable alternative to motorized transportation. Modern technology has created opportunities for people to work out of their homes, using computers for telecommuting and e-commerce to perform their jobs. If these techniques become a more widely accepted means of performing one’s job, it would have a significant positive impact on reducing pollution and improving air quality.

Fairfax County is a leader in this field with the Fairfax County Government Telework Program.

2. Vehicular Congestion and Volume to Capacity Ratio Maps

This section examines vehicular transportation options and the associated congestion that is experienced every day by drivers. Vehicle congestion on

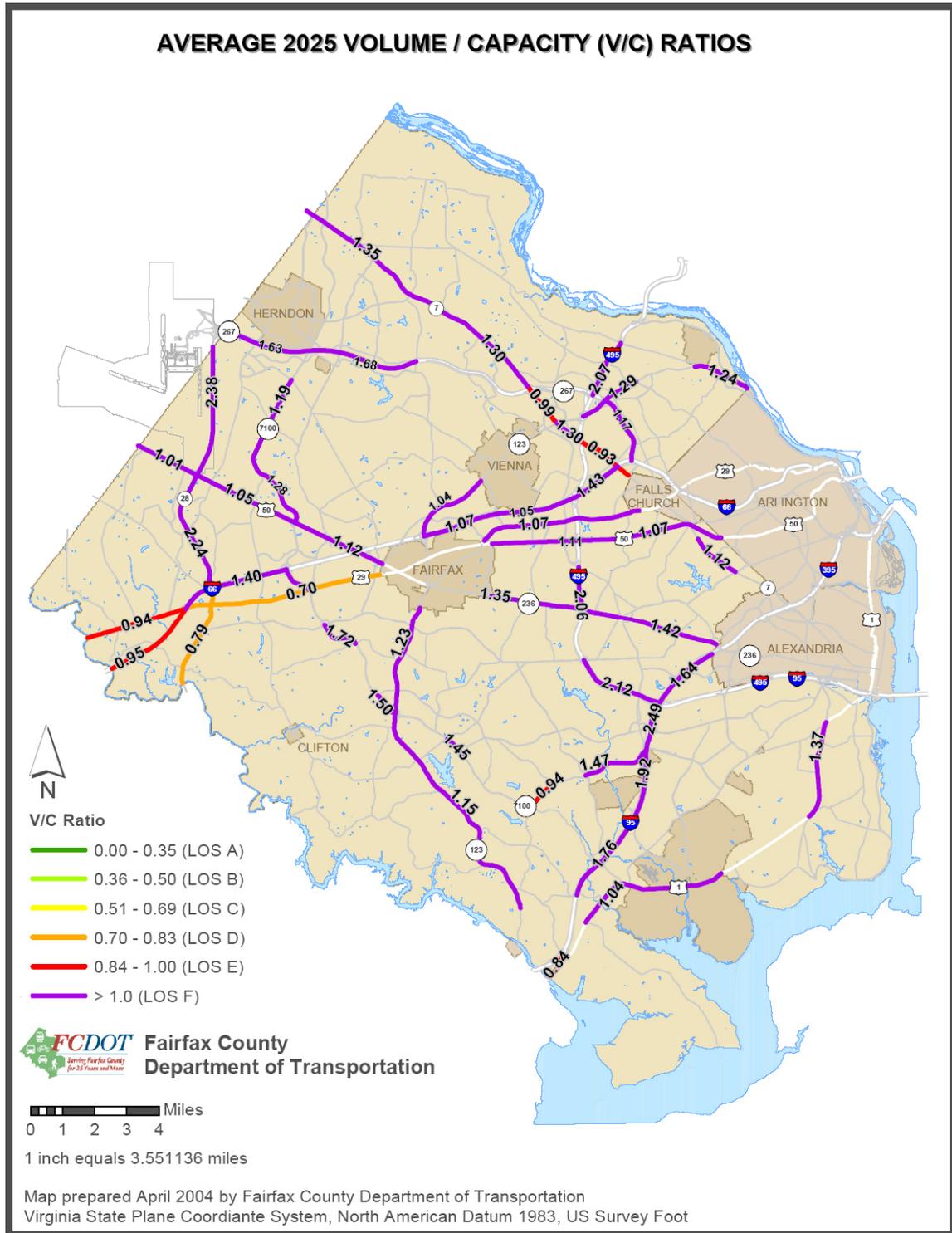
roadways is typically measured by volume to capacity ratio. The Fairfax County Department of Transportation's Planning Division created a map for this report that shows the current and projected V/C ratios on major Fairfax County roadways. As V/C increases from zero to one, the volume approaches the road capacity. Over one, there is more volume than the road can support. The Level of Service is a measure of congestion; once V/C reaches one, the road is fully saturated and the LOS is graded an F for failing.

Current V/C ratios on county highways are shown in Figure II-5. Major portions of the Beltway, I-66 and the Fairfax County Parkway already have a failing LOS.

Projected V/C ratios for 2025 are shown in Figure II-6. This information considers population growth and settlement projections. Comparing the current V/C ratio map with the future V/C ratio map provides many insights into how the transportation infrastructure grows with population. Some observations:

- The failing highways are still failing, some much worse and others actually better:
 - I-66 West of the City of Fairfax will get increasingly more congested, while I-66 east of Fairfax will get less congested.
 - The Beltway will become considerably more congested, with V/C ratios ranging from 1.5 to over two. Congestion in the “mixing bowl” area (the I-95/I-395/I-495 interchange area) will continue to get worse. The impacts of the reconstructed mixing bowl are not yet factored into the model; however, interchanges are modeled separately from segments and the data may not reflect the current improvements.
 - I-95 outside the Beltway will get significantly worse, with V/C ratios increasing from 1.01-1.04 to 1.76 or greater.
- Major roads closer to Washington D.C. will not change considerably over this period. This includes Route 29, Route 50 and Route 7 in and east of Tysons Corner. The current congestion has stabilized and increased volumes are not expected on these roads.
- Major roads in the western part of the county will get more congested; this includes portions of Routes 28, 123 and 7 west of Reston. This will primarily be induced by commuters from outside the county.

Figure II-6.



The maps do not include potential improvements from mass transit. In particular, the Dulles Rail extension will impact congestion in the Tysons Corner area, and an Orange Line extension to Centreville will impact congestion along I-66 throughout the county. The maps also do not show changes from the proposed HOT lanes on the Beltway.

Both of these improvements have a dynamic component and are more difficult to model accurately. One of the recommendations of this Chapter is to continue studies to better model the effect of transit on congestion and other dynamic aspects of a modern transit system. These improvements are being considered as part of the Transportation Section review of the Comprehensive Plan that is currently under way; the improvements need to be implemented to provide the board with better data to make future transportation decisions.

Frequently the focus of transportation congestion is on big projects, such as the mixing bowl or HOT lanes. This needs to be balanced with regular maintenance of the existing infrastructure. An important policy identified by the Coalition for Smarter Growth is “fix-it-first” to ensure that all state maintenance needs are met and to direct funding to fixing problems on existing roads and transit prior to funding new construction.¹⁰ As infill becomes the primary mode of development, the existing infrastructure will demand more resources to accommodate denser developments.

3. Residential Commuting

An interesting statistic on commuter patterns is that over 50 percent of the residents in Fairfax County work in Fairfax County (see Table II-4), with another 17 percent working in the District of Columbia. Similarly, most of the workers in Fairfax County live in Fairfax County (see Table II-5); however over 80,000 workers commute to jobs in Fairfax County from Prince William and Loudon counties. Only 12,000 workers commute to the county from the District of Columbia.

4. Transportation Options

Just as the Land Use plan has increased capacity in the same footprint through higher density, the transportation plan needs to accommodate more commuters through denser transportation options. Metrorail is a good example of denser transportation in a smaller footprint.

¹⁰ <http://www.smartergrowth.net/vision/regions/region.html>

Table II-4 Where do Residents of Fairfax County Go to Work?		
Destination	Number of Commuters from Fairfax County	Percent of Total Commuters from Fairfax County
Fairfax Co, VA	278,064	52.72 percent
District of Columbia	88,908	16.86 percent
Arlington Co, VA	48,670	9.23 percent
Alexandria City VA	27,641	5.24 percent
Montgomery Co, MD	16,943	3.21 percent
Loudoun Co, VA	16,420	3.11 percent
Fairfax City, VA	15,741	2.98 percent
Prince George's Co, MD	9,594	1.82 percent
Prince William Co, VA	7,013	1.33 percent
Falls Church City, VA	4,061	0.77 percent
Source: U.S. Census Bureau, Commuting Patterns of Fairfax County, Virginia Residents, 2000 ¹¹		

Table II-5 Where Do Workers in Fairfax County Come From?	
Origin	Number of Commuters
Fairfax Co, VA	278,064
Prince William Co, VA	44,322
Loudoun Co, VA	35,933
Montgomery Co, MD	22,148
Arlington Co, VA	20,476
Prince George's Co, MD	18,258
Alexandria City, VA	14,643
District of Columbia	12,244
Stafford Co, VA	7,249
Fauquier Co, VA	5,499
Manassas City, VA	5,145
Source: U.S. Census Bureau, Commuting Patterns of Fairfax County, Virginia Residents, 2000	

As a simple example of the space required for vehicular traffic, consider the Fairfax County Parkway. The 35 miles of paved roadway consume roughly:

$$35 \text{ miles} * 5,280 \text{ ft/mile} * 4 \text{ lanes} * 14 \text{ ft/lane} = 10,348,800 \text{ ft}^2 = 237 \text{ acres}$$

This does not count medians or access roads. For comparison, the Pentagon covers 29 acres, or 1/10th the total paved surface of the Parkway. A similar Metrorail right of way is a much thinner with a higher peak capacity. As the

¹¹ www.fairfaxcounty.gov/comm/demogrph/publist.htm

county continues to grow, a multi-modal network that continues to increase density and maximize existing infrastructure is needed.

One successful multi-modal option that is already making a difference is the Burke Centre Virginia Railway Express subscription bus route. This is a subscription service that picks up commuters and gets them to the VRE station. The key to such a service is that it makes connections and is consistent.

Additional options that use creativity and provide effective multi-modal options are needed across the county. Combining multi-size buses, pedestrian options and public outreach into a systematic plan will be needed to keep the county moving.

5. Transportation Decision Making

Management of transportation to maximize its usefulness and minimize its adverse impact on the environment is made very difficult because of the complex interrelationships of federal, state, regional, sub-regional and local entities that are all involved in Fairfax County transportation planning and funding. Local initiative in addressing transportation needs is further limited because the commonwealth of Virginia owns and maintains every public road in the county. Even subdivision cul-de-sacs are state roads.

The complexity of solving transportation problems in Fairfax County and mitigating the adverse environmental impact of inadequate or less than optimum projects can be better visualized by reading the Northern Virginia Transit Funding Resource Guide issued by the Northern Virginia Transportation Commission. This Resource Guide describes the many sources of funds that are available for transit projects and lists over 50 federal and 30 state and local funding programs. However, with governments at all levels being faced with a severely reduced capability to fund projects, they cannot provide funding levels to qualify for matching grants of funds from many of these sources.

A variety of funds are available from the federal government, but they all come with strings attached. Federal regulations, standards and guidance must be met before consideration will be given as to whether federal share contributions will be made available toward transportation needs.

In Virginia, the **Commonwealth Transportation Board** has final approval authority over the six-year transportation program for the entire state. Under guidance of the CTB, the Virginia Department of Transportation is responsible for building, maintaining and operating the state's roads, bridges and tunnels.

For Fairfax County, the transportation goals are included in, and promulgated through, the Fairfax County Comprehensive Plan. Those projects that are to be funded by county resources are included in the county's Capital Improvement Program. However, transportation projects that are to be funded through state

and federal funding are included in the Virginia Department of Transportation's six-year transportation program.

The **Northern Virginia Transportation Coordinating Council** has developed a Northern Virginia 2020 Transportation Plan, which is a comprehensive study identifying a multi-modal transportation solution to provide safe, efficient and economical choices for travel and transport of goods. The Plan has become part of the broader planning effort of the Transportation Planning Board of the Metropolitan Washington Council of Governments. Specific projects will be submitted by the commonwealth of Virginia for inclusion in Washington, D.C. region's financially Constrained Long Range Plan as funding streams open up.

A further description of the interplay of planning and funding of projects between agencies in the Metropolitan Washington area can be found in "A Citizens Guide to Transportation Decision-Making in the Metropolitan Region," which is available from the TPB of COG.

The **Columbia Pike Transit Alternatives Analysis** (Pike Transit Initiative) was conducted by the Washington Metropolitan Area Transit Authority and its engineering consultants with the cooperation of Arlington and Fairfax Counties from spring 2004 to spring 2006. WMATA undertook the Pike Transit Initiative to consider the development of an advanced transit system connecting the Pentagon/Pentagon Crystal City area with Bailey's Crossroads. In May 2006, the Fairfax County Board of Supervisors endorsed the "Modified Streetcar Alternative" recommended in the Columbia Pike Transit Alternatives Analysis as the preferred transit alternative for the Columbia Pike corridor. The endorsement allowed the project to advance to the next phase of project development in which the project team developed a financial strategy. Currently, the Columbia Pike Streetcar Project is poised to enter the environmental documentation and preliminary engineering phase of project development.

Although the project is not considered a good candidate for Section 5309 New Starts or Small Starts funding, federal transportation funding programs will continue to evolve and federal grants outside of the Section 5309 program may be available to the project. These include Congestion Mitigation and Air Quality Improvement Program and Regional Surface Transportation Program funds. A favorable National Environmental Policy Act finding would give the project potential to make use of other federal funds that may become available, and it would avoid possible back-tracking to make appropriate revisions and secure needed approvals.

6. Programs, Projects and Analyses

a. Walking and Biking Facilities

There are many potential environmental improvements that can be brought about by providing greater opportunities for non-motorized means to commute, travel or obtain recreation. They include: reducing air pollution caused by traffic congestion; reducing water pollution caused by roadway and parking lot construction made necessary by traffic demands; reducing noise pollution caused by on-road vehicles; and reducing energy consumption required to operate motorized vehicles.

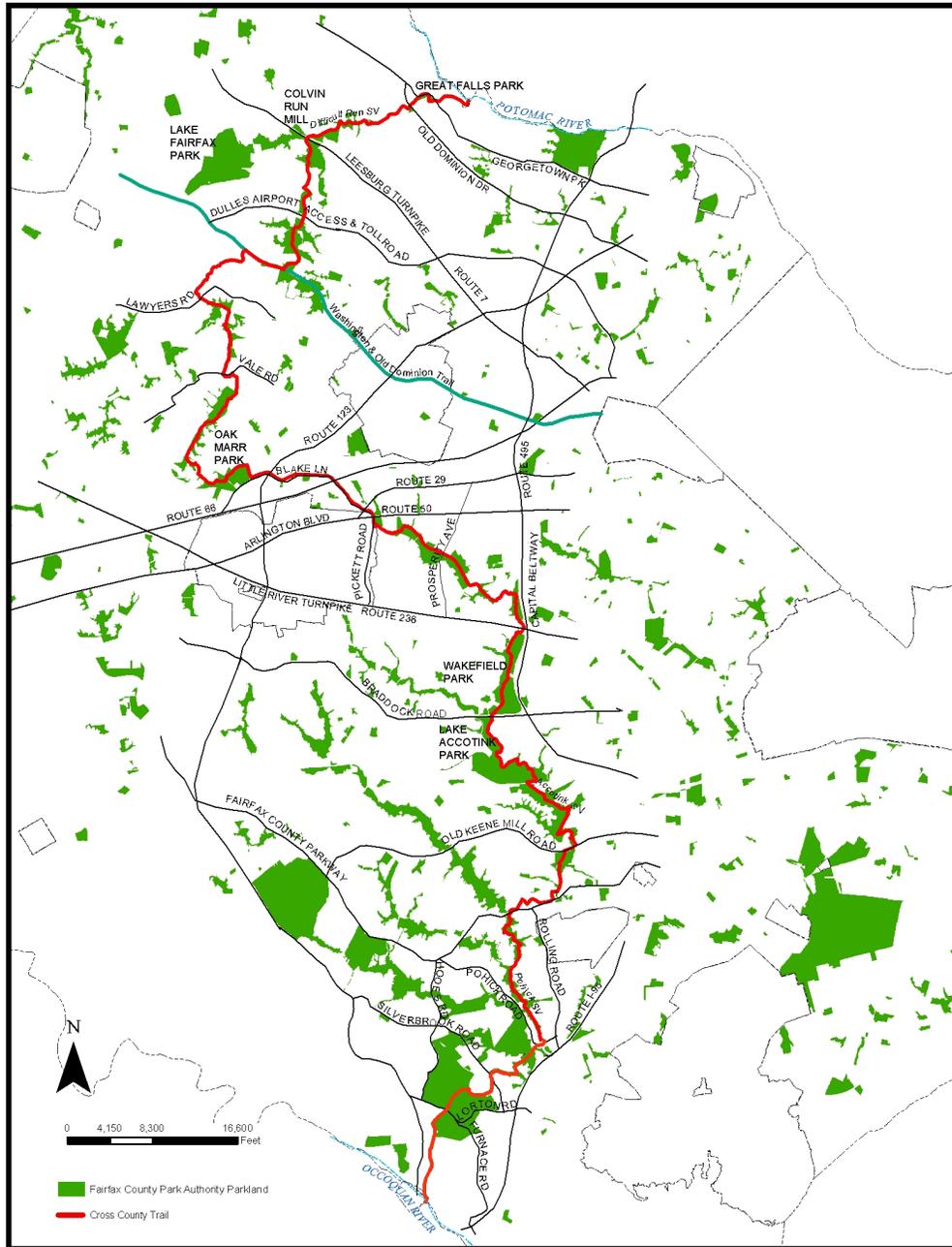
Improved non-motorized transit access by connecting hike/bike paths to the Metrorail stations and bus stops was one of the major considerations for the 2002 update of Fairfax County's Countywide Trails Plan. The Trails and Sidewalks Committee continues to improve the trail connections to transit facilities by working with the Washington Metropolitan Area Transit Administration, the Virginia Department of Transportation and the county's Department of Transportation.

The Countywide Trails Plan added on-road bike routes as a new category of trails. These trails are proposed along routes suitable for commuting and for travel to places for recreational purposes. It is expected that the planned on-road bike routes will be installed with future highway improvements according to the Trails Plan. Currently, there are on-road bike lanes located on Dranesville Road and sections of Beulah Road and Telegraph Road.

The Countywide Trails Plan is developed to provide the general locations of the proposed trails. It does not provide details such as intersection design or mid-block crossing of the street. Those details are examined during the site plan or subdivision plan review process. The site reviewer may need additional training to better detect more of the needs for safe crossing, or to seek advice from the county's Pedestrian Program Manager.

The dream of a multi-use trail crossing Fairfax County from the Occoquan River near Route 123 to the Potomac River at Great Falls is now a reality. After six years of work the Cross County Trail (Figure II-7) was completed in December 2005. As the Cross County Trail continues to attract new users, staff and volunteers evaluate and improve routes and trail surfaces to keep the trail in a usable condition.

Figure II-7: Cross County Trail



Source: Fairfax County Park Authority

It is difficult to predict how many commuters will use the trail, but the trail's completion makes possible connections to Metrorail stations as well as local trips for areas of shopping, some schools and other trails. With high gasoline prices, more residents are expected to turn to bicycles and other alternative modes of transportation in the future.

(i.) Pedestrian Program

In 2006 the Pedestrian Task Force recommended and the Board of Supervisors endorsed a ten-year funding goal of \$60 million for new pedestrian projects. The board's FY 2005 Four-Year Transportation Program funded nearly \$11 million for pedestrian projects. The FY 2007 Budget funded \$2.5 million for bus stop pedestrian projects. The 2007 Transportation Bond funded \$15 million for additional pedestrian projects and nearly \$8 million for additional bus stop projects. The board-prioritized VDOT Secondary Program funded \$2.8 million for pedestrian intersection projects. The approved FY 2009-2011 commercial and industrial tax will fund over \$7 million for additional pedestrian projects and nearly \$2 million for additional bus stop projects. As of the end of FY 2008, this and other programmed funding totals over \$48 million towards the Pedestrian Task Force's 2006 recommended ten-year funding goal of \$60 million.

(ii.) Transportation Demand Management

The county has integrated Transportation Demand Management strategies into the land development process and is working to formalize this program. TDM commitments, or "proffers," promote alternatives to single occupant vehicle trips. TDM proffers can contain commitments to provide TDM services, goals for percentage trip reduction and remedies or penalties for non-attainment of proffered goals. The TDM proffer coordinator is negotiating proffers and monitoring implementation and performance of existing proffers. In FY 2008, TDM plans were proffered for new developments in Tysons Corner, Merrifield and Fair Lakes; TDM commitments were also considered for proposals in Annandale, Springfield and Alexandria. Proffer monitoring began for properties in Tysons Corner, Vienna, Herndon and the Fairfax area.

In November 2007, the Fairfax County Department of Transportation began a consultant study on integrating TDM into the land use and approval process. The study will include a best practices report, local data collection to quantify possible TDM reductions, a TDM proffer manual and parking strategies for transit-oriented development. Staff expects the December 2008 completion of this study to lead to more effective TDM strategies and to formalize arrangements for TDM proffers.

(iii.) Fairfax County Comprehensive Bicycle Initiative

As we approach the second anniversary of the county's Comprehensive Bicycle Initiative, FCDOT continues to address the growing needs of area bicyclists and is making Fairfax County bicycle safe and friendly.

As directed by the Board of Supervisors, a major goal this year was the development and printing of the first "Fairfax County Bicycle Route Map." This map was unveiled on May 16, 2008, "Bike to Work Day." The map defines a network of preferred as well as less preferred on-road bike routes that enable bicyclists to traverse the county. The map has been so well received that a second printing has been scheduled.

FCDOT continues to coordinate with VDOT to re-stripe priority roadway segments for bike lanes as part of several overlay/paving projects. Shoulders were added to a segment of Stringfellow Road last summer and Westmoreland Street in the McLean area of the county will be retrofitted with on-road bike lanes in 2008. Work continues with the Gallows Road On-Road Bike Lane Initiative.

Work has been initiated to define potential areas for an Interconnected Network Pilot Bicycle Program. Potential sites include Vienna-Dunn Loring-Merrifield Town Center and the Fairfax County Government Center.

Utilizing county transportation bond funds and federal Congestion Mitigation and Air Quality Grant funds, project scopes are being prepared for bicycle spot projects countywide. Projects include the installation of bicycle racks and lockers, construction of missing segments of trails and bridges in order to provide connectivity and retrofitting roadways with on-road bicycle facilities.

FCDOT continues to manage a bicycle locker rental program at the Reston East and Herndon Monroe Park-and-Ride lots. Additional lockers and racks are planned at various locations countywide.

b. Employer Services Program

Fairfax County has a teleworking option for the county staff. An even more significant application of teleworking or telecommunication is part of the county's Employer Services Program. This program partners with area businesses to facilitate the creation and implementation of commuter programs. Commuter programs have been shown to improve productivity, make recruitment and retentions easier and improve morale. The Employer Services Program also partners with businesses and the state and federal

governments to encourage telecommuting and the use of mass transit, carpools, vanpools, biking and walking instead of drive-alone commuting.

A description of the Employers Service Program can be found on the county's Web site at: www.fairfaxcounty.gov/fcdot/Employer.htm.

The support from the Board of Supervisors and the county executive, plus the marketing and training campaign and technology enhancements, are working. Increased interest in telework is evident in the number of employees who participate in training sessions, ask for information via email and phone and sign up for telework. There are now teleworkers in departments that previously had none. Managers have expressed an interest in telework as a way to continue business operations during inclement weather or emergencies. The county's active partnership in regional efforts to expand telework keeps it current on best practices and identifies the county as a resource for other businesses on teleworking.

With respect to the county's telework program, the increased publicity and organizational focus on teleworking has resulted in an increase in the number of teleworkers, from 138 in December 2001 to over 1,000 by 2005 (thereby meeting a goal that was set based on the Metropolitan Washington Council of Governments' goal of having 20 percent of the regions' eligible workforce teleworking by 2005), and the number of teleworkers continues to increase, as there are, as of October 2008, 1,360 county teleworkers. Based on information provided to EQAC previously regarding the 2005 telework goal, it is estimated that county teleworkers potentially saved roughly 80,000 commuting hours and 2.5 million commuting miles in a year. The county will continue to increase the number of county workers who telework and will emphasize telework as an important component of its Continuity of Operations Planning in order to ensure that county workers have the tools to work from remote sites.

c. Transportation Alternatives

The combined outreach efforts of FCDOT demand management programs, known as the Transportation Services Group, along with programs sponsored by the Metropolitan Washington Council of Governments Commuter Connections programs, have allowed the county to reach over one hundred thousand people this year who live or work in Fairfax County with messages about environmentally friendly transportation options.

- Over 300 Fairfax County employers have implemented Transportation Demand Management programs.
- There are 17,592 parking spots in the county's Park & Ride lots that allow commuters to park near public transportation hubs; the lots average about 70 percent capacity.

- The RideSources program received over 500 applications from commuters looking for car or van pool matches last year.
- Within Fairfax County government, 180 employees participate in the Transportation Benefits Program, taking public transportation to work, and, as noted earlier, over 20 percent of eligible employees telework at least one day a week. The county also provides reserved parking spaces for car and van pools at some facilities.
- Information about transportation options such as the high-occupancy vehicle lanes, RideSharing, Guaranteed Ride Home, car sharing, using bus and rail and teleworking is disseminated at outreach events throughout Fairfax County.
- The Fairfax County Community Residential Services Program partnered with multi-family complexes, area developers, and civic organizations to promote telecommuting and the use of mass transit, carpools, vanpools, biking and walking instead of drive-alone commuting.
- The Fairfax County Transportation Services Group also supports Transportation Management Associations and other organizations that assist commuters and community, including the Dulles Area Transportation Association, LINK of Reston Town Center, TyTran in Tysons Corner, and the Transportation Association of Greater Springfield.

New “Green Diesel” buses were also introduced in 2007. They run on ultra-low sulfur diesel and include a particulate trap, which can reduce emissions up to 90 percent. The new buses conform to Environmental Protection Agency 2007 clean air mandates. Bike racks have been installed on all buses and SmarTrip fare boxes have also been added. The Fairfax Connector’s new buses are low-floor vehicles which are more passenger friendly; they do not require a lift for passengers needing assistance.

E. THE INTERRELATIONSHIP BETWEEN LAND USE AND TRANSPORTATION

The above sections presented “Land Use” and “Transportation” as separate environmental issues. The focus of this section is on the interrelationship between land use and transportation. Throughout this chapter, three fundamental observations about Fairfax County have been examined. They are:

- The county is rapidly approaching build-out and is transitioning from a growth focus to redevelopment.
- The county transportation systems are strained by congestion and getting further constrained by sprawl beyond the county.

- The county will continue to grow in population and prosperity. It needs to provide residential, commercial and transportation options for more people.

As the concept plan becomes realized, the transportation infrastructure must be in place to accommodate those new living and working populations. With the county reaching build-out, the transportation options are constrained. Dense options, such as Metrorail and HOV, are enablers of future growth. Alternatives and choices, such as mixed use development, transit oriented development, telecommuting and flex-work, reduce the amount of transportation that is required.

Combining the land use projections with transportation planning is essential for the county to continue to grow and prosper. By considering the land use and transportation facets of future decisions together, the county can continue to maintain a high quality of life. Conversely, when land use or transportation decisions are made in isolation, they will exacerbate the problems of build-out and congestion and negatively impact quality of life.

The county has already started along this path with the designation of Urban, Suburban and Transit centers. The Board of Supervisors has adopted Comprehensive Plan guidance for several such areas based on the recommendations of board-appointed task forces. The comprehensive results of these efforts have been impressive, and EQAC anticipates similar results from ongoing and future task force efforts. Equally important are policy changes that encourage more comprehensive planning, such as Transportation Demand Management.

1. Programs, Projects and Analyses

This section reviews projects that have combined elements of land use and transportation via special studies or revitalization areas that incorporate mixed use and transit oriented development. They are in various stages, from conceptual to planning to implementation, and provide valuable lessons for future projects. A consistent thread that runs through them is the holistic integration of Land Use and Transportation that has contributed to public acceptance and enhanced utility.

a. Tysons Corner Urban Center

Tysons Corner is the only “Urban Center” designated in the Fairfax County Comprehensive Plan. It consists of 1,700 acres of land that currently house 16,000 residents and provide employment for roughly 105,000 people. The current plan for Tysons Corner has evolved over the past 48 years. In 1960, Tysons Corner was first viewed as having potential to become the Fairfax County “downtown.” In 1975, the Board of Supervisors commissioned a special study that guided development through 1993. In 1994, a second major study was commissioned that produced a significant amendment to the Comprehensive Plan. The result of this long term planning is mixed.

On the positive side, Tysons Corner has become a successful economic engine for the county as the 12th largest employment center in the United States. On the negative side, however, the area faces significant challenges with traffic congestion, pedestrian accessibility, stormwater management and environmental impact. It has effectively become a destination, not a place to stay, and it lacks the essential 24-hour vibrancy of a traditional downtown.

In March 2005, the Fairfax County Board of Supervisors created the Tysons Land Use Task Force (officially the “Coordinating Committee”) with the following mission to update the 1994 Plan to:

- a. Promote more mixed use;
- b. Better facilitate transit-oriented development;
- c. Enhance pedestrian connections throughout Tysons Corner;
- d. Increase the residential component of the density mix;
- e. Improve the functionality of Tysons Corner, and;
- f. Provide for amenities and aesthetics in Tysons Corner, such as public spaces, public art, parks, etc.

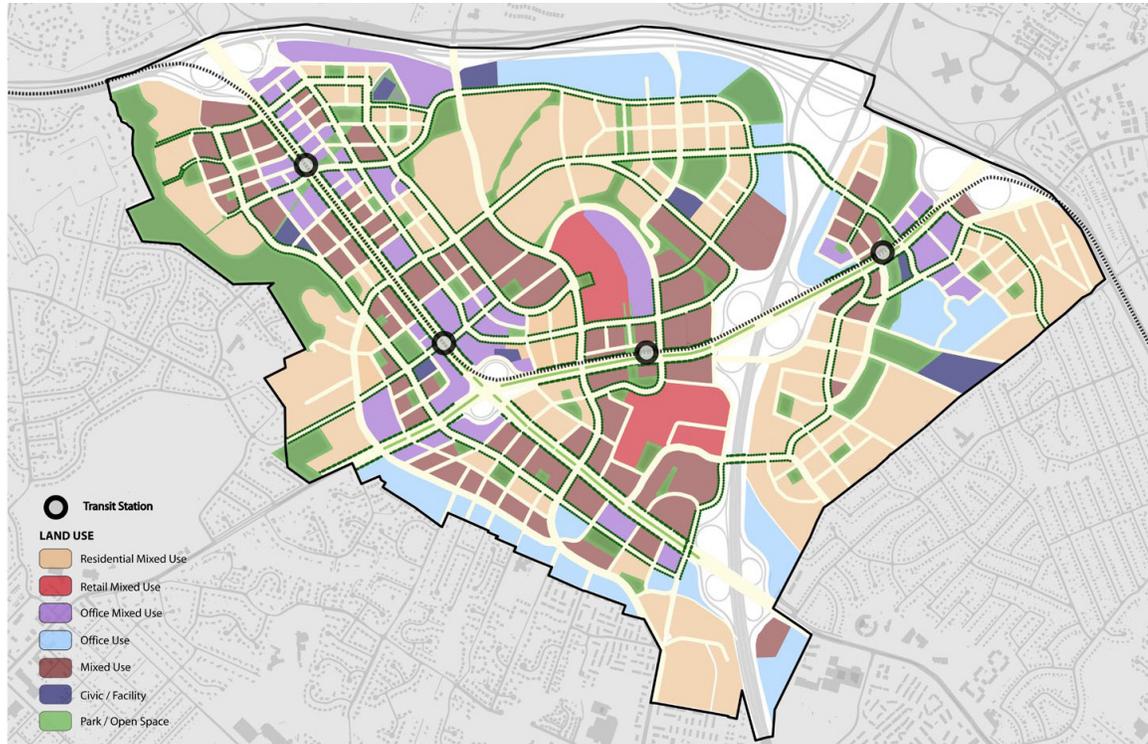
In September 2008, the task force delivered a report containing a revised vision and area-wide recommendations. Throughout the three year process, the task force worked closely with over a dozen public and private agencies, engaged with world-renowned consultants that specialize in transit oriented design and conducted 45 public meetings attended by over 2,000 participants.

The recommendations for a transformed Tysons Corner are organized around six key points:

1. Create a people-focused urban setting;
2. Redesign the transportation network to balance walking, biking, transit and the automobile;
3. Place a strong focus on the environment;
4. Develop a vital civic infrastructure of the arts, culture, recreation and the exchange of ideas;
5. Sustain and enhance the contributions of Tysons Corner as the county’s employment center and economic engine; and
6. Establish an authority for implementation that provides the flexibility, accountability and resources necessary to achieve the vision.

The conceptual plan for the vision is shown in Figure II-8. The majority of the development is mixed use with different concentrations highlighted by their primary orientation towards residential, office, or an even split of both.

**Figure II-8: Tysons Land Use Task Force's
Recommended Conceptual Plan for Tysons Corner
(Land Use, Parks and Open Space Network)**



Source: PB PlaceMaking, PB, MVE, BAE, Robert Cervero, *Transforming Tysons: Vision and Area Wide Recommendations*, Prepared for Tysons Land Use Task Force, Draft, September 15, 2008.

The vision would increase the residential population six-fold from 16,000 to 100,000 and almost double the number of jobs from 116,000 to 200,000. This is more balanced and would increase the vibrancy of the community.

Transportation would be centered on the four Metrorail stops, with significant density within 1/8 mile of each station, tapering outward. A new circulator transit system is proposed to weave between the Metrorail stops and the community. To encourage development along the circulator routes, additional development density is planned within 400-600 feet of the circulator route.

The plan is subdivided into eight separate districts or places, each with a particular character. These districts are effectively neighborhoods that allow further detailed planning. The connectedness and uniqueness of each place would be mutually supportive and add vibrancy.

Environmental stewardship is an important aspect of the plan. Specific objectives and incentives are presented for green buildings. Open space is an integral part of the conceptual plan, with 160 acres identified as open space or parkland. Rigorous stormwater management practices are recommended to restore stormwater retention to the equivalent of a forested condition. Redevelopment will include stream valley restoration. With this green-focused redevelopment, the plan should help the county achieve an 80 percent reduction in carbon emissions by 2050 with the goal for Tysons Corner to achieve carbon neutrality by 2030.

The Vision and Area Wide recommendations are the first milestone for an updated comprehensive plan. The next steps that must be taken are to create Area-wide plan text, District and Sub-district Plan text, and a Draft Plan Amendment. The Board of Supervisors has accepted the Vision and Area Wide Recommendations. The next steps are being coordinated by county staff with guidance from a Task Force Advisory Committee working with the Planning Commission.

As the county continues to refine the Comprehensive Plan for Tysons Corner, there are two significant transportation projects underway that are being coordinated by other authorities:

1. The Dulles Corridor Metrorail Project is proceeding with plans to extend the Metro from East Falls Church to Wiehle Avenue, with four stations in Tysons Corner. This project is under the authority of the Metropolitan Washington Airports Authority.
2. The I-495 Virginia HOT Lanes Project will deliver the most significant enhancements to the Beltway since its opening in 1964. It includes two new lanes in each direction from the Springfield interchange to just north of the Dulles Toll Road. This project falls under the authority of a public/private partnership between VDOT and two private corporations.

These projects are executing concurrently with agreements to coordinate as they move forward. Having separate authorities responsible for implementing different aspects of land use and transportation is not an ideal situation. The agreements in place are a first step towards an integrated approach. With multiple levels of decision making authority distributed between the county, state, and federal governments, such coordination may be the only practical arrangement. It highlights, however, the complexity involved in integrating land use and transportation.

b. Dulles Corridor Metrorail Project

Rail service has been envisioned in the Dulles Corridor since construction of Washington Dulles International Airport in the late 1950s, when the right-

of-way for future rail was reserved in the median of the Dulles Airport Access Road. The Metropolitan Washington Airports Authority is responsible for the extension, with construction slated for March 2009.

The Federal Transit Administration has approved the Metropolitan Washington Airports Authority to advance the Dulles Corridor Metrorail Project extension from East Falls Church to Wiehle Avenue into final design. The \$159 million in federal funds which has been released for the project can be used for:

- Right-of-way acquisitions;
- Reimbursement of third party preliminary engineering costs;
- Continuing with utility relocations;
- Final design work;
- Project administration;
- Maintenance of traffic efforts; and
- Engineering and design of rail cars.

The Comprehensive Plan for Tysons Corner is integrated with the Metrorail construction. Specific bonus density increases are designed to be phased in with the Metrorail construction.

c. Suburban Centers

The county has designated seven areas as Suburban centers. These contain a complementary mixture of office, retail, residential uses and parks (including Urban Parks and active recreation facilities) in a cohesive, moderate intensity setting. The Reston and Merrifield Suburban centers are presented as representative of the comprehensive approach at each area.

Reston Suburban Center: The purpose of the plan for the Reston Suburban Center area is to encourage a more urban and transit-oriented development pattern. The objective is to create, at each Transit Station Area, a pedestrian-oriented core area consisting of mixed-use development that includes support services while maintaining transitional areas at the edges of the Transit Station Area.

Options for development in the Transit Station Areas allow higher intensities based upon compliance with specified conditions. Those options are designed to be site specific.

Merrifield Suburban Center: On June 11, 2001, the Board of Supervisors adopted an amendment to the Comprehensive Plan that created the Merrifield Suburban Center. The area is served by the Dunn Loring – Merrifield Metrorail station and has regional and local access from I-66, I-495, Route 29, Route 50 and Gallows Road. As set forth in the

Comprehensive Plan, the vision for the Merrifield Suburban Center includes two core areas: one focuses on development near the transit station and the second is planned to evolve into a town center. A new “Main Street” would connect the two core areas. The interrelationship of transportation and land use is evident in the Comprehensive Plan for this Suburban Center, particularly in the following planning objectives for the Suburban Center:

- (a) *Encourage revitalization and redevelopment of portions of the Merrifield Suburban Center to create more attractive and functionally efficient commercial and residential areas with pedestrian-friendly and transit-oriented environments.*
- (b) *Encourage mixed-use development that includes pedestrian and auto circulation systems that integrate the development both internally and externally, resulting in transit-oriented and pedestrian-friendly environments.*
- (c) *Encourage the development of additional housing (including affordable dwelling units) in the Merrifield Suburban Center so that employees may live near their workplace and transit services, in order to reduce the number and length of commuter auto trips.*
- (d) *Develop a cohesive roadway system that provides a more extensive grid of streets to serve the town center, Transit Station Area, and the area between.*
- (e) *Develop a cohesive pedestrian circulation system linked to open spaces such as plazas, courtyards, greenways, and parkland in order to facilitate walking and reduce reliance on private automobiles.*
- (f) *Develop mass transit options, transportation strategies and planned highway improvements to mitigate traffic impacts in the Merrifield Suburban Center and in adjacent residential neighborhoods.*

The Merrifield plan is in the midst of becoming reality. The Merrifield task force spent two years developing the plan as adopted by the county. Between 2001 and 2005 changes in Merrifield were minimal. In 2005 and 2006, significant construction began and there are several large projects currently underway.

The task force approached the plan changes in a new way. It started with the zoning as it existed and created a by-right baseline for what could be constructed. It then had a traffic model constructed based on the by-right baseline. The induced traffic would clearly overwhelm the transportation system. With that knowledge, they created a vision for a workable integrated district. The result is the dual core plan with density around the

transit station and a town center away from the transit station connected by a main street. The main street allows traditional moderate rent-based suburban businesses to remain in the district as intense economic development occurs in the new core areas.

The lessons from the Merrifield task force include:

- Understanding the by-right baseline;
- Modeling transportation demand and integrating land use and transportation;
- Comprehensive land use planning to include community concerns, mixed uses, affordable housing, business stability and economic growth; and
- Comprehensive transportation planning to include transit oriented development, street grids, pedestrian access and mass transit.

d. Transit Station Areas

The county contains six Metrorail stations with four more slated for Tysons Corner and additional stations stretching through Dulles Airport along the Orange Line. These Metrorail stations are evolving into the transportation hubs for the county. Redevelopment can be seen at each Metrorail station. At both the Vienna and Dunn Loring-Merrifield Metrorail stations, the Washington Metropolitan Area Transit Authority is in the process of selling land adjacent to the stations to be transformed into transit oriented developments. These transit oriented projects provide the density for future growth with a smaller per-person traffic demand than single family housing that is typical in the county.

Some of the important lessons from the Fairlee development proposed adjacent to the Vienna Metrorail station include:

- Metrorail Capacity—the Metro system needs to expand to support new riders at these denser developments. Consideration is needed for both additional Metro cars and bottlenecks in the system, such as the Rosslyn tunnel.
- Replacement of Metrorail Parking—as redevelopment occurs at the transit stations, existing commuters need to be accommodated.
- School Capacity—as density increases, public facilities and schools need to be enhanced and expanded to support new residents.
- Transportation – Transportation Demand Management needs to be in place to verify transportation projections are in line with the development reality and mitigation plans need to be approved in

advance. The Fairlee project highlighted the need for better TDM across the county.

- Environmental Issues—include protecting the environment and providing environmental or natural space for residents. Environmental protection includes stormwater management as well as preserving air quality, managing waste, recycling and “green” building to minimize energy consumption. Environmental opportunity means that additional open space needs to be preserved for a denser human population.
- Mix of Uses—the mix of uses should help to create a synergy of uses resulting in an opportunity for both current and new residents to walk to shopping and other services in their neighborhood.
- Protection of Stable Neighborhoods— any increased density should be focused and constrained in a core area of the Metrorail station platform. The purpose of focusing density is twofold: first, TOD studies show that the highest percentage of transit ridership is generated by development within ¼ mile of the platform and that transit ridership drops off past the quarter mile. Secondly, the protection of stable neighborhoods requires that higher density be constrained and that density does not creep beyond clear, logical boundaries.

These lessons were specifically identified in the Fairlee Comprehensive Plan motion with specific language written into the Plan amendment to address them. As other transit stations are developed, similar consideration will be required.

e. Summary

With the advent of build-out and the continued growth within the county, new development will be much more complicated than the initial development within the county. There will be changes imposed on existing residents and businesses and impacts that are both real and perceived. Integrated land use and transportation planning is essential to maintain our quality of life into the future.

From an environmental perspective, the initial development of the county created a baseline that currently exists. As redevelopment occurs, be it at higher density or simply expanding existing development, the county goal should be to improve the existing baseline. There is no need for any further environmental degradation.

By continuing to integrate land use and transportation planning, the county can change and grow without sacrificing our quality of life.

F. ACCOMPLISHMENTS

Over the past years, Fairfax County has made changes to improve the county's ability to integrate land use and transportation.

- Adopting the Board of Supervisors Environmental Vision and creating the Environmental Improvement Plan to achieve that vision
- Implementation of the Integrated Parcel Lifecycle System which replaced UDIS and integrates land use data into the county's award winning GIS
- Completing the demographic survey, which collects important data about future projections for the county population and residents' issues through 2025

The county has also initiated several studies and task forces working on specific land use and transportation projects:

- The Tysons Land Use Task Force charged with providing recommendations to update the 1994 land use plan for Tysons Corner
- The Planning Commission work on Transit Oriented Development, Low impact Development standards and Transportation Demand Management
- The GIS Outreach Committee to better understand residents' needs and concerns for GIS information

Several lessons have also been incorporated into the county planning process and the Area Plan reviews. Every proposed project includes staff analysis of induced transportation, educational and environmental impacts. This systematic modeling is an accomplishment and EQAC encourages continued incorporation of new modeling information for proposed projects.

The county also achieved the significant goal of 20 percent staff participation in telework.

G. COMMENTS AND ONGOING CONCERNS

1. Build on the County's Successes

EQAC commends the Board of Supervisors for actively supporting teleworking among the county staff and by employers throughout the county and for reaching its goal of 20 percent participation by county staff. EQAC encourages the county to publicize this success, publish the best practices and lessons learned, and encourage others to follow. The county should also continue to

work with the federal government and other jurisdictions to encourage them to set similar goals, and the county should work with the Virginia Congressional Delegation to secure resources to establish teleworking sites within the county.

2. Improve Transit Utilization

EQAC recommends that the county focus on improving transit utilization through a systematic plan that includes multiple options within a community. For example, the Virginia Railway Express Burke Centre EZ Bus provides a convenient alternative to commuting to the Burke Centre VRE station. This can be combined with pedestrian improvements, more connector bus options and biking trails that together provide a diverse transportation plan.

3. Comprehensive Understanding

The county is very good at understanding micro changes in the county. EQAC is concerned that the county is missing the macro effects of these micro changes. The new IPLS system provides a base capability to capture and analyze the changes. EQAC's recommendations in the past to replace UDIS identified specific benefits. EQAC will continue to work with staff as IPLS evolves to realize those benefits:

- Evaluate planning issues and development options, account for Comprehensive Plan changes and capture real time plan changes.
- Facilitate public safety and plan for emergency preparedness.
- Forecast future growth.
- Understand and analyze land use at a finer resolution and provide information on mixed use.
- Evaluate the environmental effect of each parcel and provide data necessary for modeling and understanding the cumulative effect of development.

EQAC commends the county for its decision to acquire a full set of planimetric data and oblique imagery. The full planimetric data layer is an important addition to the gathering of base land use data. Oblique imagery is just starting to be leveraged, but it can transform the way the county plans land use.

4. Disparate Authorities

EQAC is concerned that the county does not have sufficient authority over transportation decisions that are in the county's best interest. The Governor's decision on the Tysons Corner aerial rail alignment, even though all parties agreed the tunnel was preferable, shows how conflicting goals will result in inferior results. The aerial route will create less efficient transportation around the rail pillars, resulting in more air pollution in the urban core, less available surface area to manage and mitigate environmental impacts and inefficient entrance and egress at stations disconnected from the surrounding buildings.

The Virginia HOT Lane project is also of concern and needs to be monitored closely. This project directly impacts the county but is being managed by VDOT with two private companies, Fluor and Transurban.

5. Green Buildings

The county is becoming a leader in building green buildings and has adopted Comprehensive Plan policy that includes broad support for green building practices and establishes linkages between the incorporation of green building/energy conservation practices and the attainment of certain Comprehensive Plan options, planned uses and densities/intensities of development, particularly in the county's growth centers. EQAC commends the county for committing to LEED certification for all new county buildings and for its efforts to encourage green building and energy conservation practices through the zoning process (see Chapter 1 of this report for details). EQAC encourages the county to further support green building design and energy efficient buildings.

H. RECOMMENDATIONS

1. Land Use and Transportation Vision and Assessment

The current Fairfax County Comprehensive Plan traces its roots back to the Planning Land Use System program that culminated in 1975 and the "Goals for Fairfax County" adopted in 1988. Numerous reviews and regular updates have occurred over the past 30 years, yet as stated in the current Plan: "Many of the key components of the 1975 Plan remain in the revised Plan, such as the emphasis on focusing growth in 'Centers'; decreasing automobile dependency; and protecting environmentally sensitive areas and stable neighborhoods. What has changed are some of the means to achieve these ends."

As the county approaches build out, EQAC recommends that the county evaluate the Plan and publish an updated version of the "State of The Plan, An Evaluation of Comprehensive Plan Activities between 1990-1995 with an Assessment of Impacts through 2010" (published in 1996) to cover plan activities between 1995-2008 and assess impacts through 2025.

EQAC would like to discuss with staff what would be entailed in pursuing a complete review of the Comprehensive Plan. The current process of reviewing each section does not provide a comprehensive review of the interrelationships between sections, especially Land Use and Transportation, and does not review the underlying principles of the Plan. Further, there have been a number of substantial planning efforts and external factors that have occurred since 1995 that have not been evaluated comprehensively for their countywide implications. Among these efforts and factors are: the Base Realignment and

Closure actions; the forthcoming extension of Metrorail through Tysons Corner to Dulles Airport; the Tysons Corner Transportation and Urban Design Study; substantial redevelopment projects, proposals and studies in revitalization areas; and major transportation projects such as the construction of high occupancy toll lanes on a portion of the Capital Beltway.

The evaluation and assessment would help clarify the historical lessons learned and identify areas that have proven successful at a macro level across the county and where it needs to be strengthened for a future vision. The comprehensive preparations would be timely with the significant changes happening in the county.

2. Data and Modeling

- a. As noted throughout this Chapter, EQAC commends the county for developing the GIS and data infrastructure necessary to integrate Land Use and Transportation planning and modeling. EQAC recommends that these tools and capabilities continue to be pushed out for use by the general public. We understand that there are financial and training costs associated with these advanced technologies, but we recommend that the county find ways to further empower the public and leverage our existing investments.
- b. EQAC recommends that the county begin leveraging three-dimensional models in the planning process. The first step is to maximize the use of oblique data in the planning process, especially the Area Plans Review process. New proposals should include three-dimensional data that can be overlaid with county data to create realistic models.
- c. EQAC recommends that the county invest in models that leverage GIS capabilities and county data. This includes:
 - Runoff models that use impervious surface data
 - Improved transportation models that incorporate multi-modal systems
 - Analysis of the macro effects of land use and transportation decisions

These models should highlight congestion, air quality, commuting patterns and health effects for use in future decisions.

Such information is necessary as the county becomes more complex and densely developed.

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www.smartergrowth.net/vision/regions/region.html

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Virginia Department of Rail and Public Transportation and Washington Metropolitan Transit Authority, Draft Environmental Impact Statement and Proposed General Plans for the Dulles Corridor Rapid Transit Project, June 2002.

OTHERS

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www.walkable.org/

Virginia Bicycling Federation:
www.vabike.org/

An excellent bibliography of additional resource materials on the land use and transportation can be found at the Web site of the Washington Regional Network for Livable Communities: <http://www.washingtonregion.net/programs/index.html>

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER III

AIR

QUALITY

III. AIR QUALITY

A. ISSUES AND OVERVIEW

1. Introduction

We guarantee good air quality by monitoring the air for specific contaminants and taking action against those who cause the contamination level to exceed allowed limits. This is a federal-state-regional-local partnership. Fairfax County's major responsibilities involve conducting the monitoring of air quality and coordinating with regional organizations on plans intended to reduce air pollution and improve air quality. More recently, the county has also taken a leadership role beyond the limits of its traditional air quality partnership and has helped formulate and has subsequently adopted a program to reduce gases that may be the cause of global warming.

With regard to traditional air quality matters, Fairfax County has demonstrated a continuing commitment to being an active partner in improving the region's air quality. In the bullets below, EQAC notes the efforts taken by the Board of Supervisors and county staff to promote and encourage clean air initiatives and practices.

The county completed no Environmental Quality Improvement Program elements related to air quality in 2007, but the Board of Supervisors:

- Endorsed county use of the Natural Landscaping Manual and the Implementation Plan (10/13/08);
- Committed to implement the following voluntary control measures for inclusion in the Virginia portion of the Washington metropolitan region's Clean Air Act State Implementation Plan:
 - Purchase 5.8 million kWh of wind energy annually, through March 2008; 7.25 million kWh of wind energy, from April 2008 through March 2009; 11.6 million kWh of wind energy, from April 2009 through March 2010;
 - Use ultra-low sulfur fuel for all off-road and stationary diesel applications, 2007;
 - Expand green building activities; and
 - Continue participation as a Clean Air Partner, through 2010. (12/3/07)
- Approved a Comprehensive Plan Amendment that strengthens air quality guidance in the Plan; incorporates support for green building practices into the Plan; and, encourages and promotes the application of these practices in the private sector (12/3/07); and

- Directed staff to:
 - Prepare a Zoning Ordinance Amendment to de-classify wind turbines and towers associated therewith as accessory structures and undertake to eliminate hurdles to installing wind turbines.
 - Explore legislation for the General Assembly to address homeowner association covenants that prevent the installation of solar panels, and report to the Board's Legislative Committee with recommendations. (6/30/08)

The remainder of this section introduces some important topics to which the county either has responded or will have to respond.

a. Clean Air Interstate Rule – Help Reduce SO₂ and NO_x

On March 10, 2005 the U.S. Environmental Protection Agency issued the Clean Air Interstate Rule, which would have achieved the largest reduction in air pollution in more than a decade. CAIR would have required 28 eastern states (including the states in the Metropolitan Washington region) to permanently cap emissions of sulfur dioxide and nitrogen oxides. EPA promulgated this rule to address the fact that upwind states contribute significantly to nonattainment of eight-hour ozone and fine particulate/PM_{2.5} standards in downwind states. Implementation of the rule would have assisted nonattainment areas in achieving the National Ambient Air Quality Standards.

Based on air quality modeling conducted by the Metropolitan Washington Council of Governments, Fairfax County expected a 20 percent reduction in oxides of nitrogen, an important precursor in the formation of ozone. These potential reductions were an important part of the Washington region's portion of the Clean Air Act State Implementation Plan, a plan to reduce air pollution in our region. Actual reductions in the metropolitan area along with reductions of transported NO_x will be critical to attaining the federal standard during ozone season.

On July 11, 2008, the D.C. Circuit Court of Appeals struck down (vacated in its entirety) both the Clean Air Interstate Rule and the CAIR federal implementation plan. The rule was brought before the court due to charges by the state of North Carolina that challenged EPA's decision to allow unrestricted interstate trading in allowances.

The court ruled that CAIR would not require individual states to reduce emissions but rather it focused on regional emissions reductions goals. The court held that this conflicted with the requirements of the Clean Air Act. This aspect of the court's ruling also required that the cap and trade portion of CAIR also be struck down, as it might result in no emissions reductions in upwind states.

The CAIR rule would have replaced the NO_x SIP Call cap and trade program which now limits the amount of smog-forming NO_x emitted by air pollution sources. The

CAIR rule also included revisions to the Acid Rain Program regulations streamlining the operation of the Acid Rain SO₂ cap and trade program.

There are four large power plants (major sources under the Clean Air Act) within the Washington D.C. area and some of these power plants have emitted considerable quantities of NO_x into this area as a result of decisions to purchase emission reduction allowances outside of the Washington Metropolitan air shed.¹ Under the CAIR rule, these plants could have continued to emit NO_x by purchasing emission allowances from sources well away from the Washington D.C. area. Because the court has struck down this rule, these plants will be less able to avoid using pollution controls.

The court remanded the rule to EPA and at this time the agency has not decided how, or even whether, it can rewrite the rule to allow for a cap and trade program that requires each state to attain national air quality standards. The existing programs will remain in place, but many states have indicated they will take independent action to form cap and trade programs within their own borders. Virginia has not yet declared how it will respond to the CAIR decision.

State Implementation Plans have been submitted for the Washington Metropolitan region (Maryland, Virginia and Washington, D.C.). An eight-hour ozone SIP was submitted in May 2007, and a SIP for fine particulate matter (expressed as “PM_{2.5}”) was submitted in April 2008. Both SIPs have proposed to take NO_x and SO₂ reduction credit from the CAIR. Since the vacature of CAIR in July 2008, EPA has not officially disclosed its move. EPA has filed a petition for reviewing the court decision within the deadline of September 24, 2008. At this point, in the absence of any guideline from EPA, the actions needed to rectify allocated pollution credit in SIP are unclear. The impact of this void may mean the revision of SIPs to find measures to substitute the credits that are supposed to be derived from CAIR.

d. Metropolitan Washington Council of Governments Air Quality Plan

The Metropolitan Washington region was previously designated as a severe non-attainment area under the one-hour ground level ozone standards. The region had to demonstrate attainment of the standards by November 2005. The region developed a plan to do this and established limits on emissions of volatile organic compounds and nitrogen oxides from the transportation (mobile) sector. The one-hour ground level ozone standard was revoked in June 2005 and replaced with a tougher, eight-hour ground level ozone standard. The region did demonstrate attainment of the one-hour ground level ozone standard by November 2005. The region is classified as a moderate non-attainment area under the new eight-hour standard and has until June 2010 to demonstrate attainment of the standard. The region has developed the required plan to demonstrate attainment, which

¹ Three of these plants are in Maryland (Morgantown, Chalk Point and Dickerson) and one is in Virginia (the Potomac River Generating Plant in Alexandria).

established new limits of VOC and NO_x emissions from the transportation sector. The plan was submitted to the state air agencies by the June 15, 2007 deadline. Additionally, in December 2004, EPA designated the Metropolitan Washington region as nonattainment of the standards for another criteria pollutant, Particulate Matter (addressing small (“fine”) particles, expressed as “PM_{2.5}”). The Metropolitan Washington region will have to demonstrate attainment of the PM_{2.5} standards by April 2010. The region’s SIP to attain the PM_{2.5} standards was submitted to the US EPA by April 2008. The Metropolitan Washington Council of Governments attainment plan is available at:
<http://sharepoint.mwcog.org/airquality/Shared%20Documents/Forms/AllItems.aspx>

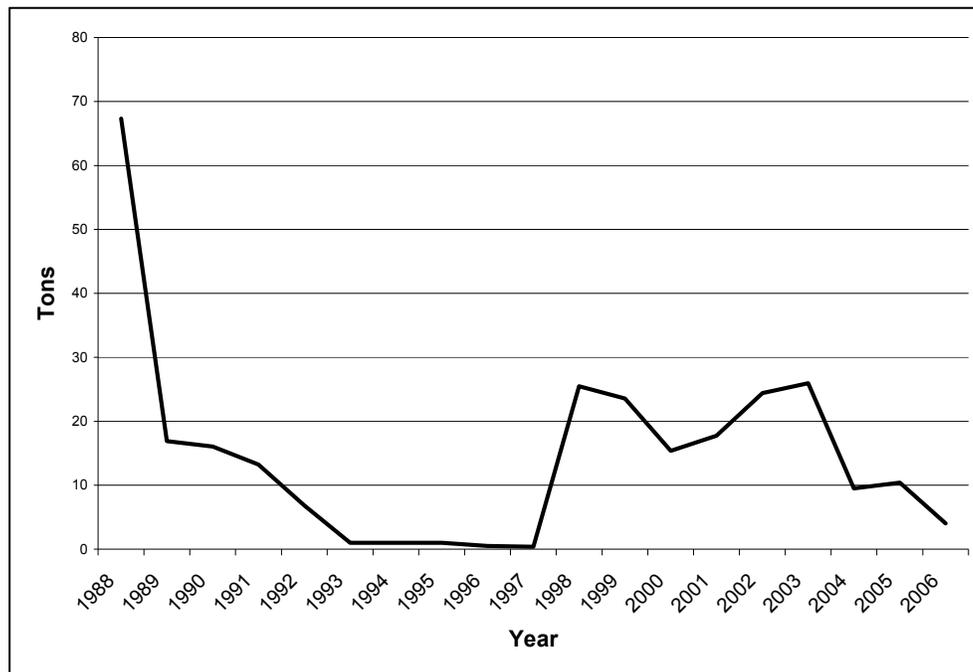
2. Air Quality Status in Northern Virginia

a. Hazardous Air Pollutants and Enforcement

The United States Environmental Protection Agency tracks the emission of air pollutants from stationary sources, including sources in Fairfax County. Some of these emissions are discharged through smoke stacks and some emerge from the source without treatment. All are regulated under law. During 2007, Virginia’s Department of Environmental Quality conducted 331 inspections of facilities within Fairfax County, finding 38 instances of non-compliance. All but three violations have been resolved. The list below identifies the three non-compliant facilities and the status of Virginia DEQ’s enforcement activities.

- **Romeros Auto Service Incorporated:** The facility was issued a Request for Corrective Action for record keeping deficiencies note during an on-site inspection conducted on 12-21-2007. There is no record of a response to the RCA. The inspector assigned to the facility has scheduled follow-up action. At this point in time, the facility is still listed as out of compliance.
- **George Mason University – Fairfax:** The facility was required to stack test on Natural Gas and #2 Oil for a variety of permitted pollutants. Testing was done on gas but not oil, and an Executive Compliance Agreement was issued to address the Notice of Violation. According to the state’s database and available documents, the facility still has not tested on oil fuel.
- **Upper Occoquan Sewage Authority:** A Consent Order is still active. The facility is meeting its schedule. The Supplemental Environmental Project is to be completed soon and the action will be resolved at that time.

Despite these violations, EPA data show a low level of hazardous pollutants in Fairfax County. Figure III-1 displays the most recent information on hazardous air pollutant emissions within the county. Note that this graph displays significantly updated data for past years. It also shows a continuing reduction in hazardous air pollutants within the county over the past four years.

Figure III-1: Hazardous Air Emission Air Quality Trend

Source: USEPA Toxic Release Inventory, accessed 8-17-2008.

b. Ground-level Ozone

The Metropolitan Washington area, including Fairfax County, was classified as a severe non-attainment area for the one-hour ozone standard and a moderate non-attainment area for the eight-hour ozone standard during 2004. To obtain compliance with the eight-hour standard, the three year average of the fourth-highest daily maximum eight-hour average value at each monitoring site in a region must not exceed 0.08 ppm. Ozone is a precursor to smog and can cause breathing problems for those sensitive to smog, especially those with asthma. Based on three years of complete, quality-assured ambient air quality data, EPA finds this region to be in compliance with National Ambient Air Quality Standards for one-hour ozone (Federal Register, April 28, 2008).

On March 12, 2008, EPA announced a final rule revising the NAAQS for ozone. The new standard tightens the primary and secondary standards to 0.087 parts per million (ppm). As a result, it is expected that there will be a significant increase in the number of ozone violation days during the ozone season in this region, including Fairfax County.

c. Ozone Exceedances in 2007

The U.S. Environmental Protection Agency evaluates compliance with ozone standards by examining the maximum level daily ozone levels at each monitoring

site within the Washington metropolitan area. Because there can be unusual ozone levels that are beyond reasonable human control, EPA disregards the three highest days and examines the fourth-highest daily maximum levels at each monitor. It averages these levels for each monitor over three years to determine whether the area has attained the air quality required by the federal ozone ambient air quality standard. Attainment of the ozone standard in the Metropolitan Washington area will require each monitoring site in the region to have a three-year average equal to or less than 0.08 ppm.

Monitors in Fairfax County recorded violations of the eight-hour ozone standard on seven days during the 2007 ozone season. The Washington region registered 16 days with violations of the eight-hour standard during the 2007 season.

Various studies have shown that much of the Washington Metropolitan area ozone problem originates west of the area and is beyond the control of Virginia, Maryland and the District of Columbia.

Table III-1. Regional Eight-Hour Ozone Exceedances, 2007		
Date	Number of Stations that Exceeded the Standard	Maximum Values in the Metropolitan Statistical Area; Maximum 8-Hour Ozone (ppm)
5/26/2007	1	0.091
5/30/2007	5	0.089
5/31/2007	2	0.086
6/18/2007	11	0.100
6/19/2007	3	0.088
7/9/2007	6	0.089
7/17/2007	10	0.095
7/28/2007	1	0.088
8/1/2007	1	0.085
8/2/2007	4	0.091
8/4/2007	9	0.110
8/7/2007	5	0.091
8/15/2007	1	0.085
8/25/2007	1	0.088
9/5/2007	2	0.088
9/25/2007	1	0.086

Source: Metropolitan Washington Council of Governments

Figures III-2 and III-3 present regional and county air quality trends as they relate to the eight-hour ozone standard. It is evident from these figures that the metropolitan area has had continuing difficulty meeting the eight-hour ozone standard. This indicates that the county needs to expand its air quality planning and technical support efforts.

Figure III-2: Air Quality Trends in Relation to an Eight-Hour Ozone Standard

**Ozone Exceedance Days
Eight-Hour Standard**

Source: Fairfax County Health Department

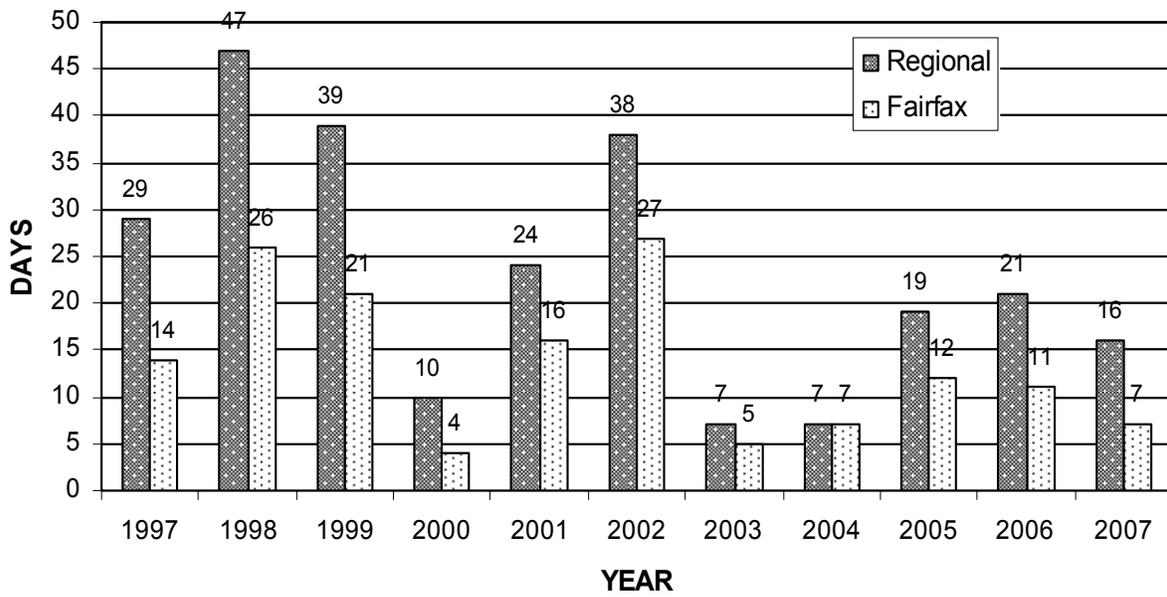
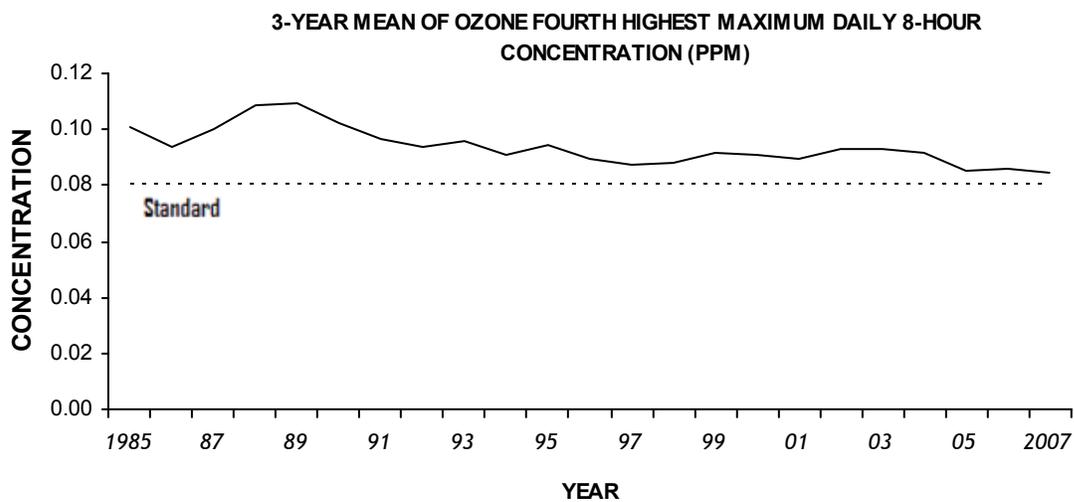
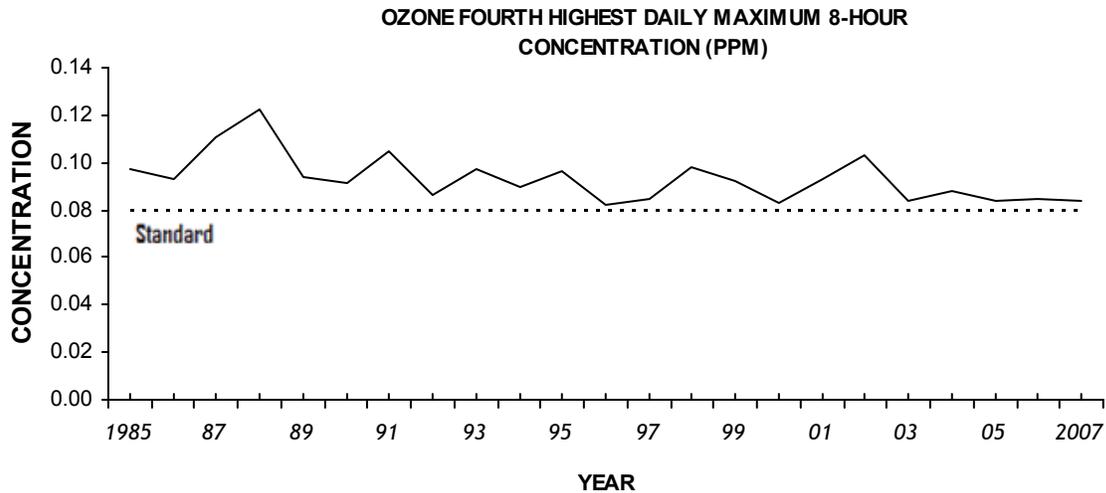
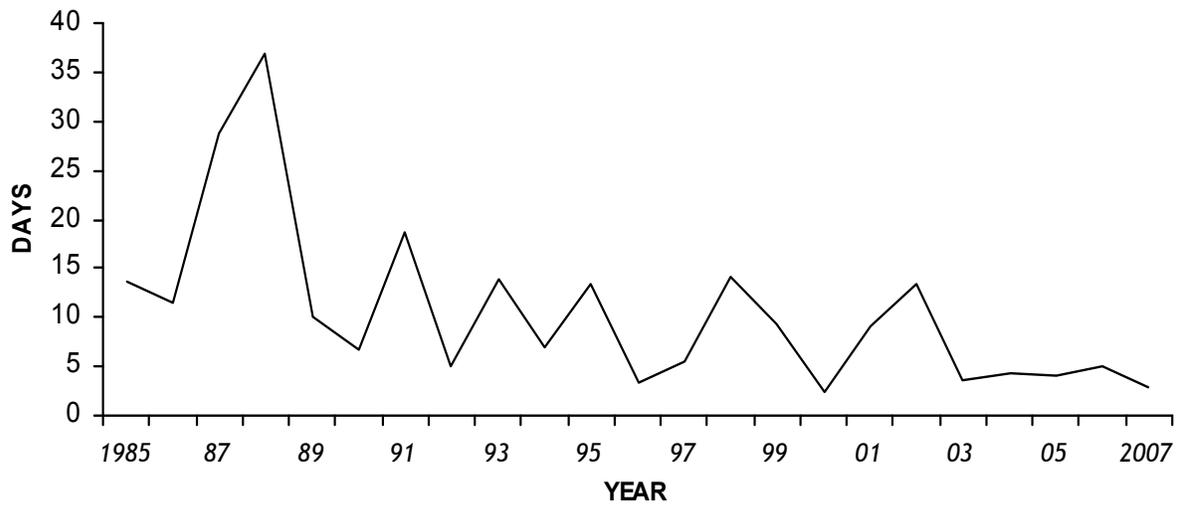


Figure III-3: Air Quality Trends in Relation to an Eight-Hour Ozone Standard

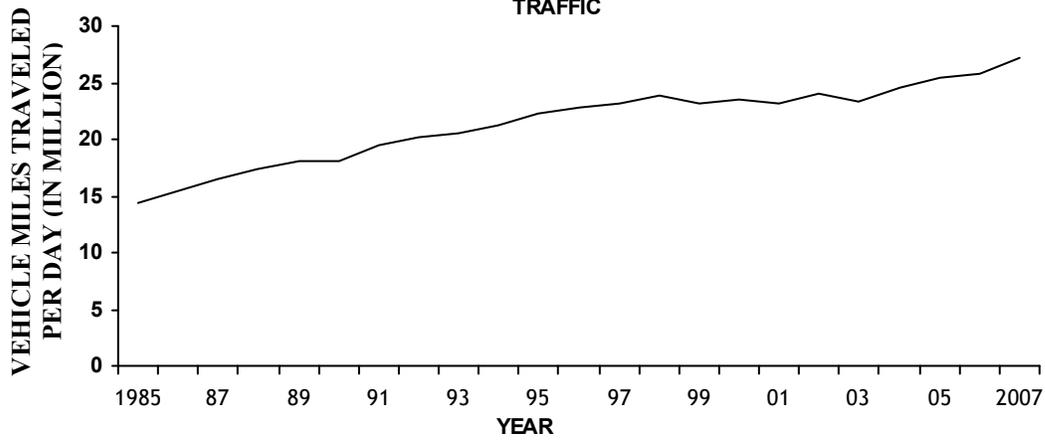
Source: Fairfax County Health Department/Fairfax County Monitoring Sites, VDOT



DAYS WITH MAXIMUM DAILY 8-HOUR CONCENTRATION ABOVE OZONE STANDARD



TRAFFIC



B. MAJOR PUBLIC AGENCY RESPONSIBILITIES

1. Introduction

Although compliance with National Ambient Air Quality Standards and resulting air quality management responsibilities is a function of federal law, in Fairfax County these responsibilities have been split between the commonwealth of Virginia and the regional metropolitan planning organization, on which Fairfax County holds a seat and which the county staff is required to support. MPOs are set up under the Clean Air Act in metropolitan areas with populations in excess of 50,000. In more difficult situations, MPOs are multi-jurisdictional, as is the case in the Washington MPO. Members of MPOs are appointed by the governors and mayors of affected jurisdictions to represent areas included in the MPO. The MPO works with state departments of transportation and transit providers in identifying transportation needs and priorities. They make transportation investment decisions for the metropolitan area and, by default, for the individual regions encompassed within the MPO.

2. Commonwealth of Virginia

a. Virginia State Air Pollution Control Board

This board is authorized to propose policies and procedures for air quality regulatory programs, including emissions standards for landfills and vehicles.

b. Department of Environmental Quality

This department is responsible for establishing or adopting standards for air quality, air quality monitoring and vehicular inspection and maintenance programs. Prior to 1996, Fairfax County held responsibility for enforcement of these state and federal requirements. Thereafter, upon Fairfax County's rejection of this role, DEQ has the default enforcement responsibility.

c. Virginia Department of Transportation

This department is responsible for planning, developing, delivering and maintaining transportation for the traveling public.

3. Region – The Metropolitan Washington Council of Governments, the Metropolitan Washington Air Quality Committee and the National Capital Region Transportation Planning Board

COG is the Metropolitan Washington regional planning group that works toward solutions to regional problems related to air and water quality, transportation and housing. COG also manages other programs such as those responsible for forecasting demographic changes. The MWAQC, which is a part of COG, is responsible for all air

quality planning in the Metropolitan Statistical Area identified under Section 174 of the Clean Air Act. The authority of MWAQC is derived from the certifications made by the governors of Virginia and Maryland and the mayor of the District of Columbia. MWAQC was established to conduct interstate air quality attainment and maintenance planning for the Metropolitan Washington region. Members are appointed and Fairfax County currently has three members of the Board of Supervisors on the committee. The Transportation Planning Board serves as the designated MPO for the Washington region and is responsible for regional transportation planning and conformity. The TPB is staffed by the Department of Transportation Planning, which is part of COG. Members of the TPB are appointed, and Fairfax County currently has two members of the Board of Supervisors sitting on the TPB. TPB and MWAQC work together on air quality and transportation issues. COG is also responsible for issuing air quality indices on a weekly basis.

a. MWAQC Technical Advisory Committee

This committee was established to advise and assist MWAQC in planning for and maintaining the region's air quality. Members review technical issues and documents before they are submitted to MWAQC for review and approval.

b. Interstate Air Quality Council

On May 31, 2005, Virginia Governor Mark Warner, Maryland Governor Robert Ehrlich, Jr. and D.C. Mayor Anthony Williams signed a Memorandum of Understanding creating the Interstate Air Quality Council. The council consists of six members: the secretaries of the environment and transportation from each of the three governments. The IAQC provides overall guidance and streamlined planning to ensure the states and the District meet their shared goals of improved air quality, including compliance with new federal standards for ozone and fine particulates, and efficient transportation. The IAQC works in concert with the air quality and transportation committees of COG to achieve its goals.

c. Forecasting Subcommittee

This subcommittee considers how to monitor and report the new eight-hour ozone standard and how to devise guidelines for issuing health alerts during the ozone season.

d. Attainment Subcommittee

This subcommittee considers evidence for the case that the Washington non-attainment area can attain the eight-hour ozone standard with the control measures already adopted.

e. Conformity Subcommittee

This subcommittee reviews Air Quality Conformity Determinations prepared by the TPB to ensure that regional transportation plans are consistent with plans to improve air quality. This includes verifying that estimated emissions from mobile sources, such as cars, trucks and buses, do not exceed the mobile budget, a cap on regional mobile emissions contained in the region's air quality plan.

f. Air Quality Public Advisory Committee

This committee has been established to provide a vehicle to brief residents on actions pending before MWAQC. This committee functions as an important source of feedback from the public on air quality concerns in the metropolitan area.

g. Control Measures Workgroup

This workgroup was established to research control measures and develop a plan of emission reducing control measures for the region to implement in an effort to reach attainment for ozone. With the recent designation of PM_{2.5} nonattainment, this group will add emission-reducing control measures for attainment of this standard to its duties.

4. County of Fairfax

a. Department of Health, Division of Environmental Health, Air Quality Section

The county's Air Quality Section sits within the Department of Health's Environmental Health Division. Due to the 1997 budget (July 1996-June 1997), the section suffered a massive reduction in force that has now translated into a skeleton staff unable to meet all existing needs. The staff went from 12 members down to five. The enforcement section was completely eliminated along with the meteorologist position. Regulatory enforcement activities on facilities reverted back to DEQ. In addition, the Air Quality Section had an Air Quality Planner position that had been transferred to the Department of Planning & Zoning in 1982. The RIF completely eliminated this position as well. The section currently has five staff (three technical field inspectors, one data analyst and one program manager) to operate the air program in a county that is larger than seven other states.

This division is authorized by the Fairfax County Code, Chapter 103, in cooperation with federal and state agencies, to conduct an air monitoring program. In the past, this division has provided consultative services to those requesting assistance in indoor air quality issues and other air quality-related matters. If there is a substantial threat to public health, on-site investigations are provided concerning indoor air quality and exposure to toxic substances in non-occupational, indoor environments. A representative from the Health Department now sits as a member of the MWAQC Technical Advisory Committee and functions as a conduit to

communicate with the county on air quality issues of concern to MWAQC. At the present time, the Air Quality Program Manager represents Fairfax County on this committee.

During a time of growing regulatory mandates and the need to coordinate and manage the increasingly complex body of information relevant to air quality planning in Fairfax County, EQAC notes that an Air Quality Program Manager position, alone, is not sufficient to ensure adequate county participation on these planning functions. EQAC also notes the need for greater technical support to county businesses and to the public with regard to both Clean Air Act responsibilities and to energy and climate change agendas being adopted by the commonwealth and the county.

The Air Quality Section continues its monitoring network in the county, measuring levels of criteria pollutants in an effort to measure compliance with the National Ambient Air Quality Standards. All of the monitoring data obtained from these sites goes into the National Air Quality Database.

b. Department of Transportation

This agency is responsible for the planning and the coordination of improvements that reduce both congestion and the vehicle miles traveled.

C. PROGRAMS, PROJECTS AND ANALYSES

1. Regional Air Quality Planning

The county's Air Quality Program Manager continues to work closely with the Director of Environmental Health and the Fairfax County Environmental Coordinator to manage air quality efforts on behalf of the county. In light of new regulations for particulate matter, the continuing failure to attain the national ozone standard and the growing demand for assistance regarding the relationship between energy use and greenhouse gases, EQAC notes the need for additional technical staff support within the Air Quality Program.

D. CONCLUSIONS AND OBSERVATIONS

1. EQAC lauds the county for focusing on air quality management and working with COG and others involved in regional planning, but notes that the county has a greater role to play and cannot meet that responsibility without additional technical staff. EQAC continues to note with gratification the county's VOC and NO_x emission reduction strategies for both short-term ozone action days and long-term ongoing initiatives, although EQAC again notes that county outreach is severely limited from lack of

technical support to local facilities. The pattern of ongoing violations identified above discloses the need for local compliance assistance if the area is to reach attainment of the standard. Although it is recognized that regional planning has attempted to develop control strategies to address this problem, they have not provided compliance assistance to local violators, nor has the commonwealth initiated either informal or formal enforcement against local violators. Thus, county action to reach out to these violators, all of whom are sophisticated enterprises, is needed if we are to reach ozone attainment. Further, to maintain such attainment, the air quality management staff feels, and EQAC agrees, that the county needs a continuing technical outreach capability it does not now have.

2. Based on the discussions that have occurred among EQAC, the interagency Environmental Coordinating Committee and the Planning Commission, EQAC understands the problems and concerns and even the limitations associated with the long-range nature of land use planning as it relates to transportation and air quality. EQAC will continue to interact in that venue to try to constructively address the issues that have been discussed there. Meanwhile, EQAC continues to welcome the opportunity to be as interactive as possible with the Air Quality Subcommittee and its activities.

E. RECOMMENDATION

1. EQAC acknowledges the budget limitations that can be expected to continue for a few years, yet also recognizes that without a greater commitment to traditional air pollution problems, the area will not attain national air quality standards. Thus, despite budget constraints, EQAC recommends that the county add one supervisory staff position to provide needed compliance assistance, program coordination and public outreach in order to help eliminate ozone-related air pollution violations occurring within the county, in order to reach full compliance with PM_{2.5} ambient air quality standards and in order to ensure adequate participation in regional planning activities. A supervisory staff position would support: the review of environmental impacts for projects and actions; extension of necessary support to address Board Matters related to Air Quality and the environment; participation in regional planning efforts through the Metropolitan Washington Council of Governments; legislative reviews; program coordination; and expanded outreach efforts to businesses and schools.

LIST OF REFERENCES

2005 Ozone Data Information, Fairfax County Health Department, Air Quality Section, Division of Environmental Health

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Air Quality Management/Fairfax County, (memorandum from the Environmental Quality Advisory Council to the Deputy County Executive dated August 28, 2002).

Air Pollution Has Declined Significantly Since 2003; Metropolitan Washington Council of Governments News Release dated September 27, 2006

Clean Air Interstate Rule, www.epa.gov/air/interstateairquality/index.html .

Correspondence dated November 15, 2002, from the Deputy County Executive to EQAC describing the intentions of the county with respect to air quality in response to the August 28, 2002, memorandum from EQAC.

Declaration on Air Quality Leadership, (memorandum from the County Executive to senior management team dated February 12, 2003).

Environmental Improvement Program Appendix 3: Summary of Retired Actions, Fiscal Year 2009

Fairfax County Web site: <http://www.fairfaxcounty.gov/airquality>

Federal Register, Part II, 40 CFR Parts 51, 72 et al, Environmental Protection Agency dated May 12, 2005.

Implementation of Available Ozone Action Best Practices, (memorandum from the County Executive to senior management team dated July 21, 2003, describing the background and objectives for the Air Quality Sub-Committee and attaching its Charter).

Fine Particle Standards, Air Quality Conformity Assessment, Metropolitan Washington Council of Governments dated June 8, 2005.

Regional Summit, Interstate Air Quality Council Memorandum, dated May 31, 2005.

State Implementation Plan (“SIP” or “Severe Area SIP”) to Improve Air Quality in Washington, DC – MD – VA Region, (final SIP and appendices available at the MWCOG Web site (www.mwcog.org/environment/air/)).

Transportation Conformity Rule Amendments for PM_{2.5} Standard, www.epa.gov/otaq/stateresources/transconf/index.htm

USEPA Enforcement and Compliance History Online <http://www.epa-echo.gov/echo/>

USEPA, Decision of the D.C. Circuit Court on the CAIR Rule <http://www.epa.gov/cair/pdfs/05-1244-1127017.pdf>

Virginia DEQ Web site, www.deq.state.va.us/ozone/

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ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER IV

WATER RESOURCES

IV. WATER RESOURCES

A. ECOLOGICAL OVERVIEW

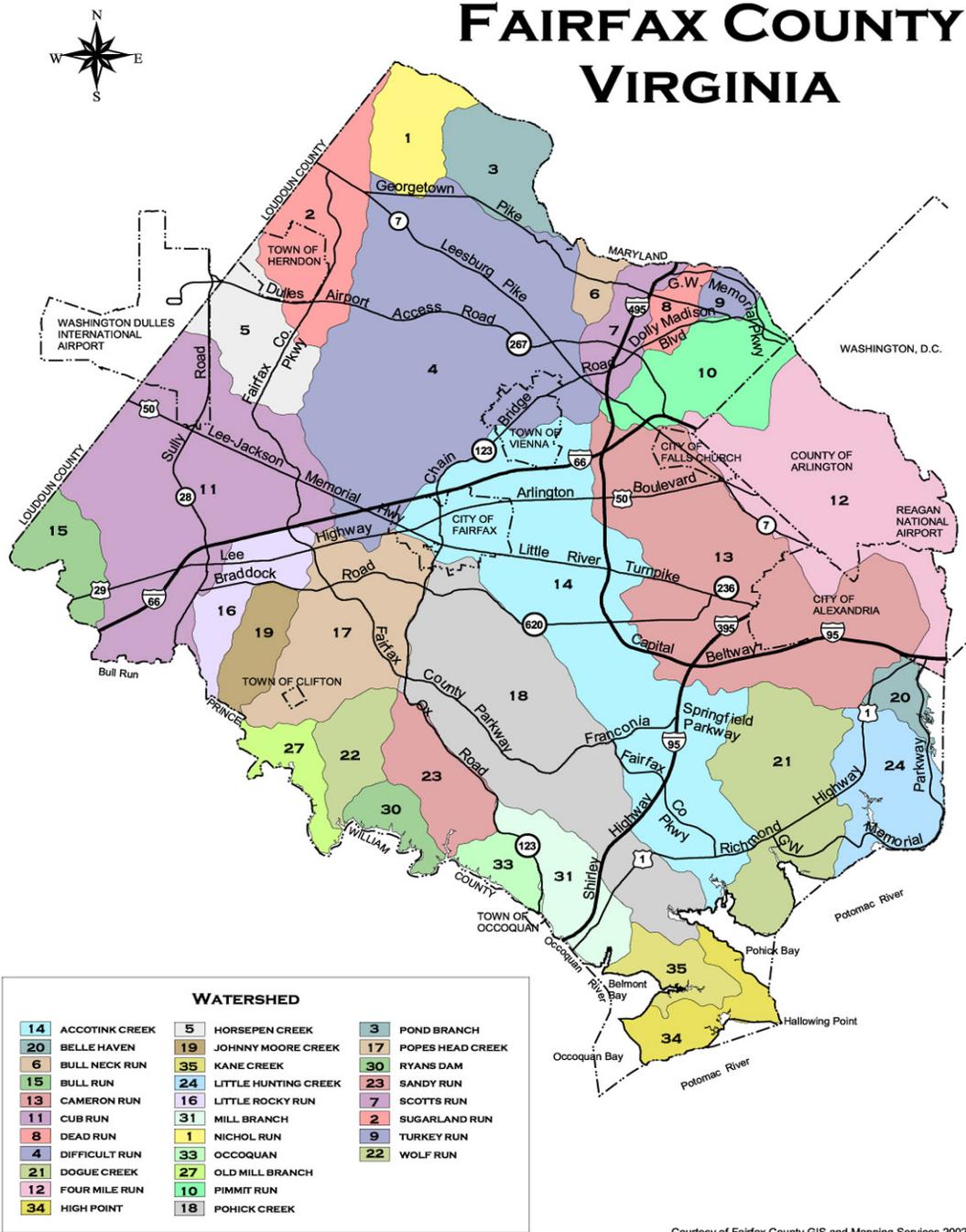
Water resources include streams, ponds, lakes and groundwater. These resources serve as sources of drinking water, recreation, stormwater conveyance and habitat for numerous organisms. Water quality can be significantly impacted by land disturbances and surface runoff. Over the past several years, Fairfax County has demonstrated a strong commitment to restore and protect its water resources through a variety of management efforts and public outreach initiatives. Unless water resources are managed properly, increasing demands put on watersheds, such as rapid development, can create many problems.

1. Watersheds

A watershed is a discrete area of land that drains to a common stream, river system or larger body of water. Watersheds include both surface water and groundwater. Everyone lives in a watershed. Large watersheds typically have sub-watersheds. There are 30 separate watersheds in Fairfax County (Figure IV-1). The largest watershed is Difficult Run (58 square miles) with ten streams that drain into the main stream, Difficult Run, which, in turn, drains into the Potomac River. The Potomac River watershed is a sub-watershed of an even larger watershed, the Chesapeake Bay watershed, which has an area of 64,000 square miles and includes portions of the states of New York, Pennsylvania, Delaware, West Virginia, Maryland and Virginia as well as the District of Columbia. All Fairfax County streams are in the Potomac River watershed and subsequently the Chesapeake Bay watershed.

2. Streams

Fairfax County is criss-crossed by a number of streams, often called runs or creeks. These streams are important aquatic habitats. Rainfall soaks into the earth and drains to low points in the surrounding land, and then emerges from the ground as seeps, springs and trickling headwaters. These small streams join with others in the same drainage area to create a stream system. There is a natural progression in size from the smallest tributaries to the largest rivers into which they eventually flow. Perennial streams flow throughout the year and intermittent streams flow only part of the year. There are approximately 860 miles of perennial streams in Fairfax County. One-third of the land in the Fairfax County Park system, approximately 7,000 acres, is comprised of stream valleys. These stream valleys are significant corridors for wildlife and the county trails system.



Courtesy of Fairfax County GIS and Mapping Services 2002

Figure IV-1: Fairfax County Watershed Map

The bottom, or bed, of a stream can consist of boulders, cobbles, gravel, sand and/or silt. The type and amount of substrate in a stream makes up the in-stream habitat. Within a stream are shallow, fast flowing areas called riffles. Dissolved oxygen levels are high because water is flowing over rocks, mixing air into the tumbling water. Alternating with riffles are deeper pools and runs where flows slow and particles of inorganic and organic matter fall to the bottom and oxygen levels are reduced. Streams support a diverse community of plants and animals that spend all or part of their life cycles in the water.

The aquatic food chain begins with leaves and other decaying plant and animal material called detritus. These materials are carried into the stream from the surrounding forests and fields by wind and water runoff. Aquatic vegetation such as algae is also an important food source. Benthic (bottom-dwelling) macro (large) invertebrates (without a back-bone) eat this organic matter. Benthic macroinvertebrates include aquatic insect larvae such as stoneflies, mayflies, caddisflies and true flies as well as snails, clams, aquatic worms and crustaceans such as crayfish. Fish, birds and other streamside wildlife, such as frogs, salamanders and small mammals, eat these macroinvertebrates.

3. Riparian Buffers

The area of trees and other types of vegetation adjacent to and lining the banks of streams is called a stream buffer or a riparian area. These areas are essential for healthy streams. The temperature in a stream greatly affects how much oxygen it can hold. Since cooler water holds more oxygen, shade providing trees and vegetation are vital along the edges of streams to help maintain cooler water temperatures so the water will hold more oxygen.

Tree cover provides food and shelter when leaves and branches fall into a stream. Streamside forests offer food, nesting sites and protection to a great diversity of wildlife, including birds, turtles, beaver and snakes. Tree roots help stabilize stream banks and provide cover for fish, crayfish and aquatic insects. Riparian areas help slow down and filter runoff. Excess nutrients carried in runoff are absorbed by vegetation.

B. IMPACTS ON WATER RESOURCES

1. Point and Nonpoint Source Pollution

Water pollution originates from either nonpoint or point sources. Nonpoint sources include surface runoff, atmospheric deposition and groundwater flow. Because of their diffuse and intermittent nature, nonpoint source pollution is difficult to control. Nonpoint source pollutant loads are greatest following rainfall and high flow events. A significant part of the nonpoint source load consists of nutrients, including nitrogen and phosphorus (organic matter, fertilizer), which stimulates algal growth. Other nonpoint source pollutants are sediment (from erosion, construction sites, eroded stream banks,

road sand), toxics (oil, paint, pesticides, chemicals and metals), pathogens and bacteria (animal waste, failing septic systems and leaking sewer systems) and trash.

Point sources are specific locations that discharge pollutants such as a discharge pipe. Because they are relatively constant and provide a steady flow of pollutants, they are easier to monitor and control. In the Potomac River watershed, most point sources are wastewater treatment plants or industrial discharges. Unlike nonpoint sources, point sources contribute relatively small portions of the nutrient loads during high flows and the majority during low flows.

2. The Effect of Imperviousness

As development occurs, natural areas that once had vegetative cover capable of absorbing water and filtering pollutants are replaced by impervious surfaces such as roads, driveways and buildings. With the increase in impervious surface and loss of vegetative cover, there is a concurrent increase in the amount and speed of stormwater runoff flowing into streams. Increased uncontrolled runoff causes stream erosion, resulting in scouring, down cutting and over-widening of stream channels and loss of streamside vegetation. Loss of shade results in increased water temperatures. During summer storms, runoff from heated impervious surfaces also raises water temperatures. In urban and suburban watersheds, rain flows off impervious surfaces such as parking lots and highways, carrying oil and other automobile wastes into streams. When stream channels become incised from down cutting, they become disconnected from their floodplains. Water cannot get out of the banks onto the adjacent floodplain where flows can be dissipated and drop their sediment loads. High flows stay in the channel, resulting in increased erosion. Silt and sediment from erosion smother the stream bottom and destroy in-stream habitat for sensitive benthic macroinvertebrates.

Simultaneously, this results in an increased number of floods in downstream areas, due to the increased volume of water. Over time, increased erosion, flooding and sediment deposition leads to habitat loss, water quality problems and damage to utilities and infrastructure.

C. SURFACE WATER MONITORING AND ANALYSES

The Fairfax County Department of Public Works and Environmental Services, Fairfax County Park Authority, Virginia Department of Environmental Quality, local water treatment plants and other organizations regularly conduct water quality monitoring and testing. The Audubon Naturalist Society and Northern Virginia Soil and Water Conservation District also coordinate volunteer water quality monitoring programs. All of these data help provide a comprehensive understanding of the condition and health of Fairfax County's water resources.

1. Countywide Watershed and Stream Assessments

a. Stream Protection Strategy Baseline Study

The Stream Protection Strategy Baseline Study, published in 2001, provides a holistic ecological base-line assessment of county streams. The study provides information on fish taxa, benthic macroinvertebrates, general evaluation of watershed and stream features and calculations of the percent impervious cover within each watershed. The Stream Protection Strategy Baseline Study can be viewed online at:

www.fairfaxcounty.gov/dpwes/environmental/sps_main.htm.

b. 2007 Annual Report on Fairfax County's Streams

This report provides data from sampling efforts conducted in 2006 and documents overall stream conditions based on the health of fish and benthic macroinvertebrate communities. In addition, the potential human health risk associated with wading or swimming in streams is assessed based on analyses of *E. coli* bacteria.

Monitoring sites are randomly selected using a probability-based stratification model or stratified random approach. Most county streams are in the “fair” to “very poor” condition or “unacceptable” based on fish and benthic macroinvertebrate monitoring data. The percentage of streams rated as “good” or “excellent” showed a slight decline from 2005. In 2006, there was an increase in sites that had better conditions for fish communities.

In 2006, fewer sites exceeded the water quality standard for *E. coli* bacteria than in 2005. Twenty percent of the bacteria monitoring sites had concentrations that were consistently below state water quality standards (235 cfu/100 ml). Water quality chemical parameters that were monitored included pH, water temperature, specific conductance, nitrate, total phosphorus and dissolved oxygen.

Sampling results indicated that approximately three-quarters of the county's stream ecosystems are impacted or impaired. Future sampling sites will continue to be randomly selected throughout the county. Project specific monitoring will also occur as more stream restoration and low impact development projects are implemented throughout the county. The 2006 Annual Report on Fairfax County's Streams can be viewed on-line at:

www.fairfaxcounty.gov/dpwes/stormwater/streams/streamreports.htm.

c. Physical Stream Assessment

Completed in 2004, the Stream Physical Assessment Study provides field reconnaissance data for the county's watershed management plans including information on habitat conditions, impacts on streams, general stream characteristics and geomorphic classification of stream type. The Countywide

Stream Assessment can be obtained by contacting the Fairfax County Stormwater Planning Division at 703-324-5500.

d. Perennial Stream Mapping

In 2003, the Board of Supervisors adopted a revised Chesapeake Bay Preservation Ordinance in order to comply with amendments to the state's Chesapeake Bay Preservation Area Designation and Management Regulations. The ordinance incorporated changes to the designation criteria for Resource Protection Areas to include water bodies with perennial flow, resulting in a significant expansion to the county's RPAs. Fairfax County's Chesapeake Bay Preservation Ordinance is available on-line at: <http://www.fairfaxcounty.gov/dpwes/environmental/cbay/>.

On November 17, 2003, based on the Perennial Streams Identification and Mapping program conducted by DPWES staff, the Board of Supervisors adopted new Chesapeake Bay Resource Protection Area maps, increasing the amount of stream miles protected by 52 percent (from 520 to 860 miles).

In 2004, the Quality Assurance/Quality Control Study of the Perennial Streams Identification and Mapping was conducted. A total of 10 percent of the streams initially surveyed between 2002 and 2003 were selected for the QA/QC study. The results of the QA/QC Study were presented to the Board of Supervisors in 2005 along with revised Chesapeake Bay Preservation Area Maps, which were approved.

The Fairfax County Stream Classification Protocol, Field Data Sheets, QA/QC study and the county's revised map of Chesapeake Bay Preservation Areas are available online at: www.fairfaxcounty.gov/dpwes/watersheds/perennial.htm.

2. Volunteer Water Quality Monitoring Programs

The Northern Virginia Soil and Water Conservation District and the Audubon Naturalist Society coordinate and manage volunteer stream monitoring programs in Fairfax County.

NVSWCD volunteers conduct biological and chemical monitoring and a habitat assessment, using the Save Our Streams protocol four times a year. The District added bacterial and temperature monitoring programs in 2005. There were 20 active monitoring sites in 2007. Information about the NVSWCD volunteer monitoring program can be found at <http://www.fairfaxcounty.gov/nvswcd/monitoring.htm>.

The ANS program uses a modified version of the EPA's Rapid Bioassessment II protocol, which includes assessment of in-stream and streamside habitat parameters and a survey of benthic macroinvertebrate populations. There are five monitoring stations in Fairfax County. In 2008, ANS monitoring stations were incorporated into the NVSWCD volunteer monitoring program.

Both programs include training and certification of volunteer monitors, equipment, data management and analysis and quality control. Data are forwarded to Fairfax County, the Virginia Department of Environmental Quality, Virginia Save Our Streams and other interested organizations or individuals. This program helps supplement the county's monitoring programs including the Annual Report on Fairfax County's Streams.

3. Fairfax County Park Authority Stream Monitoring

The Park Authority continues to support volunteer stream monitoring programs through partnerships with NVSWCD and ANS. Stream monitoring is conducted by staff and volunteers at Ellanor C. Lawrence, Riverbend and Lake Accotink Parks.

Water quality monitoring was conducted at seven sites in Huntley Meadows Park in 2007 using the Rapid Bioassessment II protocol. In the summer of 2007 only 10 samples were collected due to the extreme drought, which resulted in Barnyard Run being completely dry. Of the 10 samples collected, six were from Dogue Creek and four from Barnyard Run. On Dogue Creek, five samples were rated "good" quality and one was rated "fair" quality. On Barnyard Run, one sample was rated "fair" and the remaining three were "poor."

4. Virginia Department of Environmental Quality

DEQ performs long-term trend monitoring at 14 streams that are either in Fairfax County or border the county. DEQ has eight monitoring stations in the county. Monitoring was conducted from 2004 through 2006. DEQ staff conducts biological monitoring at four stations in the county. Failure to meet designated water quality standards may result in a stream being placed on the 303(d) list for impaired state waters.

5. Metropolitan Washington Council of Governments

a. Chain Bridge Monitoring Program

Since 1983, the Metropolitan Washington Council of Governments has contracted with the Occoquan Watershed Monitoring Laboratory to operate the Chain Bridge monitoring station on the Potomac River. The purpose of this monitoring station is to measure water quality in the Potomac River as it crosses the fall line and enters the Potomac estuary. Parameters collected include dissolved oxygen, biological oxygen demand, turbidity, temperature, conductivity, total suspended solids, fecal and total coliforms, chlorophyll-a and nutrients.

The Chain Bridge monitoring station consists of an automated sampler that simultaneously monitors the river stage at Little Falls while directly sampling at Chain Bridge, about 1.5 miles downstream, in response to changes in river flow volume. Base and storm event samples are taken throughout the year.

b. Potomac River Water Quality Monitoring

COG continues to serve as the water quality monitoring coordinator and regional repository for water quality and wastewater data in the Washington metropolitan region, as it has for more than two decades. Presently, COG serves as a repository for physical/chemical water quality data, hydro-meteorological data and wastewater loadings for the COG region, as produced by federal, state, and local government agencies. This includes data from 99 stations on the main stem of the Potomac River and the mouths of its tributaries (Point of Rocks to Point Lookout) and 46 stations in the Anacostia watershed. In addition, more than 33 wastewater treatment plants send their monthly discharge monitoring reports and monthly operating reports to COG. COG supplements these data with flow gage data from the USGS and meteorological data from the National Weather Service

c. Update on Potomac River Water Quality

The tidal section of the Potomac River is affected by many sources of pollution. With rapid population growth in the region over the past century, the Potomac River has faced water quality problems such as bacterial contamination, low dissolved oxygen and nuisance algal blooms. The implementation of secondary and advanced wastewater treatment in the National Capital Region has resulted in significant improvements in water quality and ecological conditions in the Potomac Estuary, including healthy dissolved oxygen levels, reduced nuisance algal blooms and the return of important living resources such as large mouth bass and submerged aquatic vegetation.

6. Occoquan River

The Occoquan River straddles the southern border of Fairfax County and the northern border of Prince William County. The river has been dammed near the town of Occoquan. The Occoquan Reservoir, created by the damming, serves as one of two primary sources of drinking water for Fairfax Water, which operates a facility along, and withdraws water from, the reservoir. Because of its use as a drinking water source, water quality in the reservoir is highly monitored and water from a sewage treatment plant upstream of the reservoir is carefully treated.

a. Occoquan Watershed Monitoring Laboratory

The Occoquan Watershed Monitoring Program is administered by the OWML and has been in operation since 1972. It is funded by Fairfax Water and the six jurisdictions within the watershed: Fairfax, Prince William, Loudoun and Fauquier Counties; and the cities of Manassas and Manassas Park. The program consists of nine stream monitoring stations (automated flow monitoring at all and storm sampling at most) and four Occoquan Reservoir stations. Base flow sampling in the streams and all sampling in the reservoir is done manually. In addition to surface and bottom water samples, profiles of DO, temperature and pH are also obtained at

the reservoir stations. Sampling is done weekly during the growing seasons and biweekly or monthly (if ice is present) in winter. Past water quality data indicate little change in water quality in the watershed. The Lake Manassas program is used for monitoring water and sediment at seven stream stations and eight lake stations. The eutrophication status of the Occoquan Reservoir and Lake Manassas is moderately eutrophic.

The OWML monitors quarterly for synthetic organic compounds in the watershed in a program established under the recommendation of EQAC in 1982 for water samples. In 1988, the OWML began monitoring for SOC in sediment and fish samples within the reservoir. The Lake Manassas program also funds SOC monitoring. The most frequently detected SOC is atrazine, usually detected in springtime and early summer when it is being land applied. Concentrations “are usually lower” than the maximum contaminant level of three micrograms/liter for drinking water. The pesticide dual (metolachor) and phthalates are regularly found in concentrations one or more order of magnitude below the MCL.

7. Kingstowne Monitoring and Stream Restoration

In 1999, DPWES, Northern Virginia Soil and Water Conservation District, the USDA Natural Resources Conservation Service, the Friends of Huntley Meadows and the Citizens Alliance to Save Huntley formed a partnership to restore a stream in the Kingstowne area, with the help of a grant from the Virginia Department of Conservation and Recreation. The Kingstowne stream is a tributary of Dogue Creek, receives runoff from a 70 acre watershed and is upstream of Huntley Meadows Park. Monitoring and testing have substantiated that the stream segment is stable, erosion has been brought under control and water quality and habitat in the stream are improved.

During the July 2004-2005 monitoring period, storm events and base flow samples were collected and analyzed to determine pollutant loads in Dogue Creek. Based on the monitoring data, sediment removal efficiencies for the 1,148 acre watershed were achieved for all storm events. The phosphorus removal rate did not meet the 50 percent removal requirement of the South Van Dorn III permit. DPWES is working with the Army Corps of Engineers to resolve the problem.

8. Gunston Cove Aquatic Monitoring Program

Gunston Cove is the site of the outfall of Fairfax County’s Noman M. Cole, Jr. Pollution Control Plant. The primary objective of this George Mason University program is to determine the status of the ecological communities and physical-chemical environment in the Gunston Cove area of the tidal Potomac for evaluation of long-term trends. This helps provide the basis for well-grounded management strategies to improve water quality and biotic resources in the tidal Potomac. Twenty years of data from Gunston Cove and the nearby Potomac River provide valuable long-term trends that will aid in the continued management of the watershed and point source inputs.

For a copy of the “Ongoing Aquatic Monitoring Program for the Gunston Cove Area of the Tidal Freshwater Potomac River 2004 & 2005” Final Report (Draft October 17, 2006), contact R. Christian Jones, Professor and Project Director at George Mason University.

9. Total Maximum Daily Loads

A Total Maximum Daily Load is a watershed-specific plan for bringing an impaired water body into compliance with the Clean Water Act goals. A 1999 Consent Decree required the state to develop TMDL plans for all impaired streams listed on the 1998 303(d) Impaired Waters List by 2010.

A total of 19 water bodies in Fairfax County are included in Virginia’s listing of impaired waters. Ten of the water bodies are multi-jurisdictional. Of the listed water bodies, 12 are riverine systems totaling 58.45 miles, six are estuarine with a total area of 23.23 square miles and one is a drinking water reservoir (Occoquan) with an area of 1,700 acres. The cause of the impairment for the majority of riverine systems is either fecal coliform bacteria or impacts to benthic macroinvertebrates. For the estuarine water bodies, the cause of impairment is bacteria and/or PCBs in fish tissue. According to the schedule, seven water bodies require TMDL studies to be completed by 2010, nine by 2014 and three by 2016.

Bacteria TMDLs have been established for three stream segments in the county, including one section of Four Mile Run and two sections of Accotink Creek.

Bacteria and benthic TMDL plans have been or are being developed for seven tributaries to the Occoquan River. EPA approved TMDLs for Popes Head Creek, Bull Run and the Occoquan River in 2006. TMDLs for the lower section of Accotink Creek and for Difficult Run are to be developed by 2008.

The county is participating in a cooperative effort between Maryland, the District of Columbia and Virginia to develop a TMDL for PCBs for the Tidal Potomac River. There are now 14 county water ways in or draining to the tidal Potomac River that have a TMDL for PCBs. County staff tracks developments of new TMDLs and addresses impairments on streams segments located within the county. Watershed management plans advocate best management practices to address uncontrolled stormwater runoff and associated pollutant loading to streams.

a. Accotink Creek TMDL

Due to high levels of fecal coliform bacteria, a 4.5 mile segment of Accotink Creek in Fairfax County, beginning at the confluence of Crook Branch and Accotink Creek to the start of Lake Accotink, was placed on the 1998 Virginia 303(d) TMDL list. A United States Geological Survey study was initiated in August 2001 to identify and isolate specific sources of human fecal coliform bacteria found in Accotink Creek. The study focuses on storm drains that flow during dry periods

and sampling of locations with elevated fecal coliform bacteria levels. The results of these studies will be used to identify “hot-spots” for remedial work and inclusion in the TMDL implementation plan. The USGS paper on sampling Accotink Creek can be viewed on-line at: <http://water.usgs.gov/pubs/wri/wri034160/wrir03-4160.htm>.

An extensive Dry Weather Screening program has been undertaken in the Accotink Creek Watershed as part of the ongoing efforts to detect illicit connections and improper discharges.

b. Four Mile Run TMDL

Due to high levels of fecal coliform bacteria, Four Mile Run was listed in 1996 and 1998 on the 303(d) Impaired Waters List. Although only the very upper reaches of Four Mile Run are located in Fairfax County, it is important to note the existence of a TMDL study for Four Mile Run and the participation of Fairfax County in the Four Mile Run TMDL study and implementation plan.

The Four Mile Run Fecal Coliform Study, which identified the sources of fecal coliform bacteria in the watershed using DNA testing, was completed in 2000. The study found that waterfowl contribute over one-third (31 percent) of those bacteria that could be matched. Eighteen percent of the bacteria originated from humans, 13 percent from dogs, six percent from deer, 19 percent from raccoons and 13 percent from other sources. Bacteria from humans appear to be highly localized. There were indications in that, without regard to specific host animals, E. coli bacteria seem to regenerate, through cloning, within the storm drains and stream sediments, which in turn perpetuates bacteria levels.

In 2002, the bacteria TMDL study for Four Mile Run developed by the Northern Virginia Regional Commission and the VA DEQ was approved by the EPA. NVRC, under a grant from VA DEQ, worked with four jurisdictions (Fairfax and Arlington counties and the cities of Falls Church and Alexandria) to develop an implementation plan for the TMDL study. Completed in 2003, the plan focuses on reducing bacteria contamination from human and pet sources in the watershed and includes several initiatives from community outreach efforts to large capital projects. The plan can be viewed on-line at: <http://www.novaregion.org/index.asp?nid=394>

10. Pond and Lake Monitoring and Management

There are a number of significantly sized private and public ponds and lakes throughout the county. All ponds and lakes in Fairfax County are man-made by excavation and/or the damming of streams. The majority of these ponds and lakes serve as stormwater management facilities for developments and have houses along their shorelines. There are also numerous smaller ponds associated with commercial developments, golf courses or farm properties.

These open water impoundments provide habitat for a number of aquatic organisms and waterfowl as well as recreational opportunities for humans. Due to increased runoff from development, these water bodies are often subject to heavy sedimentation, which requires frequent dredging in order to maintain pond or lake depth. Heavy nutrient loading results in large algal blooms during warmer months. Other problems that plague urban ponds and lakes include thermal stratification, reduced water clarity, decreased dissolved oxygen levels, trash and nuisance invasive vegetation.

a. Reston Lakes

The Reston Association, the homeowners association for the planned community of Reston, has an active watershed and lake management program. Four lakes, Audubon, Anne, Thoreau and Newport, as well as two ponds, Bright and Butler, are monitored. Dissolved oxygen, dissolved oxygen saturation, temperature, pH, conductivity, total phosphorus, Secchi depth transparency, chlorophyll a, phytoplankton and zooplankton are monitored. Fecal coliform and *E. coli* bacteria testing have been conducted in Lake Audubon for annual swimming events. Detailed monitoring information and data can be found in the 2006 Reston Lakes Annual Monitoring Report. This report and other information about Reston's lakes can be obtained by contacting the association's watershed manager at 703-435-6560 or visiting the Web site: www.reston.org.

In 2007, Lake Anne was randomly chosen to be surveyed as part of EPA's National Lake Survey.

In June 2008, USGS sampled the bottom sediments at Lake Anne as part of a national study of water quality trends. The scientists learn about trends by studying bottom sediment cores from lakes, in a similar way to using tree rings to look at historical climate. The scientists took sediment cores from Lake Anne in 1996 and analyzed them for metals and organic compounds and will update the trends they saw a decade ago by comparing them to the 2008 samples. Some of the most common compounds used to date the sediment cores include DDT and lead. In addition, the amount of Polycyclic Aromatic Hydrocarbons (commonly referred to as PAHs), which most commonly are found in coal tar asphalt sealers, are analyzed. For more information on the national study of water quality trends visit: <http://tx.usgs.gov/coring/index.html>.

b. Pohick Watershed Lakes

The six Pohick watershed lakes (Barton, Braddock, Huntsman, Mercer, Royal and Woodglen) are inspected annually for dam structure but are not monitored for biological or chemical parameters.

c. Lake Barcroft

The Lake Barcroft Watershed Improvement District is a local taxing district authorized under Virginia law for conservation purposes. The WID is responsible for the management of Lake Barcroft and regularly monitors water quality. Due to sediment loading the lake is in need of dredging. Given the significant amount of sediment that needs to be removed, there are concerns with the lack of adequate local disposal areas. For more information about Lake Barcroft, contact the Operations Director at 703-820-1300 or see the Web site: www.lakebarcroft.org.

d. Lake Accotink

Lake Accotink is owned and managed by the Fairfax County Park Authority and is a key feature of Lake Accotink Park. The lake was originally created by construction of a dam across Accotink Creek in 1918. The existing dam was constructed in 1943. Similar to other urban lakes and ponds, Lake Accotink has been significantly impacted by accelerated sedimentation, which has reduced the average depth of the lake to less than four feet. Project funding in the amount of \$6.15 million was included in the 1998 Park Bond Program to dredge the lake and make repairs to the dam.

In September 2005 the Park Authority Board approved a contract award to Mobile Dredging and Pumping to hydraulically dredge 161,000 cubic yards of silt from Lake Accotink and pump the material to a property owned by Virginia Concrete for dewatering and disposal. The Department of Public Works and Environmental Services is overseeing the construction contract because of its past experience on other similar type projects.

Mobilization began in October 2005 and the 2.8 mile long slurry pipe line installation was completed in June 2006. Dredging began in July 2006. The project also includes expanding and enhancing existing wetlands. At the Park Authority's request, DPWES performed a preliminary evaluation to determine if the Virginia Concrete disposal site could accommodate additional dredge material above the 161,000 cubic yards currently specified in the contract. Based on this review, up to 204,000 cubic yards of material can be disposed of at the Virginia Concrete site, and DPWES agreed to provide \$1,545,000 in additional funding to dredge and dispose of 43,000 additional cubic yards. In June 2006, a major storm caused a significant amount of silt to flow into the marina area, reducing water depth. In combination with the recent drought conditions, boat access from the marina to the main lake channel has been limited. DPWES has agreed that a portion of the additional 43,000 cubic yards of dredge material could be reprogrammed for dredging in the vicinity of the marina, reducing the dredge amount at the top end of the lake by an estimated 10,000 cubic yards.

To date, approximately 193,000 cubic yards of sediment have been removed from the lake. This represents 95 percent of the total volume of dredged material to be removed from the lake. It is anticipated that dredging of the remaining 11,000

cubic yards will be completed by fall 2008. Activities to stabilize the disposal site will be on-going after the completion of the dredging operations.

11. Groundwater Monitoring

The United States Geological Survey maintains a series of wells throughout the nation to monitor groundwater levels and drought. Two wells are located in Virginia; one such well (Site 385638077220101) in Fairfax County has been maintained since 1976. This well provides continuous real-time data that is used to assess ground water levels. Information on this well is available on-line at: <http://groundwaterwatch.usgs.gov>.

a. Leaking Underground Storage Tanks

In 2007, there were 40 new release cases investigated by the Virginia Department of Environmental Quality. As of July 2008, there were a total number of 2,456 cases, of which 84 remain open.

D. WATERSHED MANAGEMENT

1. Watershed Master Plans

In 2003, the Stormwater Planning Division of the Fairfax County Department of Public Works and Environmental Services commenced a watershed planning program to develop management plans for all 30 county watersheds. Data from the Physical Stream Assessment, Stream Protection Strategy Baseline Study and other monitoring information are being used in the development of the watershed plans. The plans encourage public involvement; provide an assessment of stormwater conditions; recommend protection strategies and improvement projects including stream restoration, riparian buffer restoration, installation of low impact development practices, and retrofitting and improving existing stormwater management facilities and infrastructure; and recommend modifications to the County Code and Public Facilities Manual.

Six watershed management plans (Little Hunting Creek, Popes Head Creek, Cub Run/Bull Run, Difficult Run, Cameron Run, and Middle Potomac) have been completed and approved by the Board of Supervisors. Combined these six plans cover 11 watersheds and 50 percent of the land area in the county. Plans for the remaining watersheds in the county (Accotink Creek, Dogue Creek, Little Rocky Run/Johnny Moore Creek, Pohick Creek, Sugarland Run/Horsepen Creek, Lower Occoquan Watersheds and Nichol Run/Pond Branch) are anticipated to be completed by 2010.

2. Restoration Efforts

In 2007, Fairfax County started or completed construction on 39 stream restoration and stabilization projects throughout the county. A number of additional projects were started and are scheduled to be completed in 2008. Many of the projects involved partnerships between DPWES, the Fairfax County Park Authority, the Northern Virginia Soil and Water Conservation District and private property owners. The 2007 Fairfax County Stormwater Status Report contains a full list and details of each project. The report can be viewed on-line at:

<http://www.fairfaxcounty.gov/dpwes/stormwater/ms4reports.htm#2006Report>.

a. Riparian Buffer Restoration

In 2007 Fairfax County continued its countywide riparian buffer restoration project in collaboration with volunteers and various other partners to help lessen the impacts of stormwater runoff on local streams. An evaluation of the inventory of buffer deficiencies from the countywide stream physical assessment was conducted to develop a planting priority list and schedule.

b. Huntley Meadows Park

In June 2006, the Fairfax County Park Authority and DPWES completed a stream stabilization and stormwater control improvement project on Barnyard Run above Huntley Meadows Park. The project involved creating a number of step pools in the stream to reduce energy and erosive force and stabilization of several hundred feet of stream bank using bioengineering techniques and native plant seedlings. In 2007, additional live stakes, tublings, and biologs were installed to further stabilize banks. Maintenance of construction access points continued in 2007.

In 2007, the county began working on the plan for Huntley Meadows Wetland Restoration project. The goal of the project is to restore the wetland to its previous, more water-filled condition with the aid of an earthen berm, water control structure, and several wetland pools. Information about the project can be found on-line at: <http://www.fairfaxcounty.gov/parks/huntley/restorationproject.htm>

c. Reston

In 2006, Reston Association worked with Northern Virginia Stream Restoration, L.C., to establish the Reston stream mitigation bank. The restoration bank was approved in March 2006. Aerial photography of watersheds and surveying/tagging of thousands of trees in the stream valleys was conducted as part of establishing the groundwork for future restoration projects. The project will implement the recommended stream restoration projects outlined in the Reston Watershed Management Plan. A team of regulatory agencies, including the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish & Wildlife

Service and the Virginia Department of Environmental Quality, will oversee the progress of the bank.

In 2007, Reston Association continued to work with Northern Virginia Stream Restoration, L.C., managed by Wetland Studies and Solutions, Inc., to help coordinate the Reston stream mitigation bank. The project is implementing the recommended stream restoration projects outlined in the Reston Watershed Management Plan.

The groundbreaking for Phase I, which covers 14 miles of stream, occurred on February 12, 2008. As of July 2008, approximately one mile of stream in the Snakeden Branch watershed has been restored, fully funded by the Northern Virginia Stream Restoration, L.C. Designs for the entire Snakeden Branch watershed are finished and are being processed. Construction should be finished on Snakeden Branch by late Spring 2009. Survey and data collection is nearly finished in the Glade Stream Valley, which is slated to be restored beginning late Spring/Summer 2009. For more information on the stream restoration project in Reston visit: <http://reston.wetlandstudies.com> or www.reston.org/water.

d. Little Pimmit Run

In June 2007, the Northern Virginia Soil and Water Conservation District completed the Little Pimmit Run Stream Restoration project. The project involved a public-private partnership that used natural stream channel design and innovative techniques to restore 675 feet of a severely degraded stream segment. It also protected three threatened sanitary sewer lines that are parallel to and crossing the stream. Nearby homeowners assumed two-thirds of the cost for design and construction of the project, which is located primarily within parkland. NVSWCD partnered with an engineering firm to design and oversee the project. Other partners, in addition to the homeowners, included the Park Authority, DPWES-Wastewater Collection Division, the Dranesville District Supervisor and Angler Environmental Construction. The design included two stacked stone walls to bankfull height, five j-hooks to control and direct flow, bankfull benches, riffles and pools throughout the segment, an integrated trail crossing, floodplain and upland grading and planting with native grasses, shrubs and trees.

Since completion, the restored channel functions as designed and successfully conveys stormwater flows. The neighbors are exploring how they can help with stewardship of the project, including the riparian buffer. Both the stream and riparian habitats are improving, and the trail users enjoy the new stream crossing.

3. Support Programs

a. Northern Virginia Soil and Water Conservation District

The Northern Virginia Soil and Water Conservation District is a political subdivision of the commonwealth of Virginia that has the same boundaries as Fairfax County. The district's goal is to promote clean streams and protected natural resources. NVSWCD works to lessen the impacts of urban/suburban activities on land and water resources in Fairfax County by working with government agencies, industry and the general public and providing technical assistance and outreach programs.

NVSWCD provides information, educational programs, volunteer opportunities and newsletters to residents on many aspects of water quality, erosion and drainage, nonpoint source pollution and stream health. NVSWCD reviews and provides comments to the county's Department of Planning and Zoning on rezoning and special exception applications, with particular attention to the properties of soils, the potential for erosion, the impact on drainage, stormwater management and the surrounding land uses and environment. The District has partnered with many groups to implement several stream restoration and LID projects.

b. Virginia Department of Forestry

The Virginia Department of Forestry helps protect water quality and forest resources in Fairfax County. In 2007, VDOF partnered with a number of organizations and volunteers including the Potomac Conservancy, FCPA, Earth Sangha, Fairfax Releaf, Eagle Scouts and the Chesapeake Bay Foundation to plant approximately 5,500 seedlings along 3,020 linear feet of streams throughout Fairfax County.

VDOF, FCPA and DPWES are partnering on a stream buffer restoration project that will replenish areas along streams with deficient riparian vegetation. Areas will be determined based on data from the Stream Physical Assessment Study, which identified deficient buffers along over 800 miles of streams.

E. STORMWATER MANAGEMENT, ENFORCEMENT AND INSPECTIONS

1. NPDES Municipal Separate Storm Sewer System Permit

Fairfax County's National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System permit (known as the "MS4 permit") requires the county to prevent the discharge of pollutants such as oil, fertilizer, pet waste and trash from the stormwater management system into waterways to the maximum extent practicable.

The permit also prohibits non-stormwater discharges into the storm drain system, such as from illicit sanitary sewer connections or illegal dumping. It also requires storm event monitoring and assessment of the effectiveness of stormwater controls being used in the county.

The Stormwater Planning Division and the Maintenance and Stormwater Management Division manage a comprehensive stormwater management program, which includes comprehensive watershed management planning, long term biological monitoring, infrastructure mapping, inspections and maintenance, retrofitting developed areas with water quality control facilities and public outreach and education. Inspections of privately owned stormwater management facilities are conducted on a regular basis (every five years). Water quality is monitored at selected storm sewer outfalls four times per year (seasonally). Outfalls are monitored during dry weather to determine the presence of illicit discharges.

The Virginia Department of Conservation and Recreation administers the MS4 permit as part of the Virginia Stormwater Management Program Permit. DCR is currently in the process of updating VPDES permits. The county's current MS4 permit expired in January 2007; however, the county is operating under an administrative continuance of the existing permit while the county and state work on the next permit. In July 2006, the county submitted its proposed NDPES permit for 2007-2012 to DCR. County staff members have been working with DCR and other municipalities on the development of the new permit requirements. In April 2008, the county responded to DCR's second preliminary draft. A permit for Fairfax County Public Schools is being coordinated with the county permit, with the addition of five new positions, approved in the FY 2009 adopted budget.

Fairfax County MS4 annual reports can be viewed on-line at:
www.fairfaxcounty.gov/dpwes/stormwater/ms4permit.htm.

2. Regional Stormwater Management Program

Since the early 1980s, the county's Public Facilities Manual has included a provision that encourages the concept of regional stormwater management. As opportunities arose, major developers and county staff pursued regional stormwater management primarily through the development process. A plan identifying the most appropriate locations for regional facilities was needed to improve this process.

The Regional Pond Subcommittee, an ad hoc subcommittee of the Fairfax County Environmental Coordinating Committee, reviewed the county's stormwater management plan and developed recommendations. The Board of Supervisors tasked the subcommittee in January 2002 to examine the role of regional ponds as well as other alternative types of stormwater controls as watershed management tools. The report, which identified 61 recommendations to improve Fairfax County's stormwater management program and to clarify the role of regional ponds, was submitted to and

accepted by the Board of Supervisors. The Regional Stormwater Management Plan is being replaced as countywide watershed management plans are being developed.

3. Stormwater Management Facilities and Infrastructure

Fairfax County maintains more than 1,200 stormwater management facilities, 1,400 miles of pipe and 45,000 drainage structures designed to protect the county's streams. In 2007, the county retrofitted seven stormwater management facilities to provide enhanced water quality. There are approximately 2,790 private stormwater facilities in the county. The county inspected all county facilities and approximately 20 percent, or 558, of the privately maintained facilities in 2007. In 2007, the county cleaned and mowed 1,120 dam embankments and completed 277 maintenance work orders to correct deficiencies in publically maintained SWM/ BMP facilities. Additionally, the county inspected 285 miles of county maintained storm drainage conveyances. The county's inventory of stormwater management facilities and infrastructure is being tracked through the use of the county's GIS databases. The county is working on Infrastructure Reinvestment Infrastructure Program that includes digitizing the storm sewer inventory.

The 2007 Fairfax County Stormwater Status Report provides updated information on the number and types of public and private stormwater management facilities in the county as well as detailed information about the types of projects being undertaken to improve and protect water quality.

4. Low Impact Development Techniques

Environmentally sensitive site design and low impact development practices serve to minimize impervious cover and replicate natural hydrologic conditions. The county is recommending and encouraging that "Better Site Design" development techniques and LID practices be used to the full extent allowed by the PFM.

Six low impact development practices (bioretention basins and filters, vegetated swales, tree box filters, vegetated roofs, permeable paving and reforestation) were developed for inclusion in the Public Facility Manual in 2006. In 2007, the Board of Supervisors adopted the amendments. The county is continuing its work with the Engineering Surveyors Institute, Northern Virginia Regional Commission and other local jurisdictions on developing a design and construction standards manual for LID applications. The manual will be recommended for adoption into the county's PFM. The county contributed to the design and implementation of several LID projects in 2007. The county will soon be implementing a number of LID demonstration projects including several vegetated roofs.

With the addition of these important techniques comes the challenge of what will be a significant increase of small stormwater management facilities that will need to be tracked, inspected, and maintained. Enforcing maintenance requirements will also be a challenge given limited staff.

In 2007, with the help of a grant from DCR, NVSWCD conducted a study of 20 existing rain gardens in the county, three to five years old, both publicly and privately maintained. The evaluation focused on their physical characteristics, in relation to how well they were functioning. The analysis included infiltration tests and lab analyses of soil texture, organic matter content and bulk density. The filter media were examined to determine the type and level of pollutants retained and their relationship to the area drained. The actual installation of each rain garden was compared to the approved design. In general, publicly maintained rain gardens fared better than private ones, as did those built according to their approved designs. The study suggests several design recommendations. Perhaps the most important recommendations for overcoming the problems that were observed are for training and education that would ensure rain gardens are properly installed and well-maintained.

5. Erosion and Sediment Control

DPWES continues to make improvements to the county's erosion and sediment control program, resulting in a greater emphasis and a higher quality of inspection services. DPWES developed a quality assurance program and trained field specialists on how to handle erosion and sediment control violations. DPWES also developed a prioritized inspection program, in accordance with guidelines established by the Virginia Department of Conservation and Recreation, that will consider slope, soil type, proximity to streams and extents of buffer areas to determine an overall rating for any given site. In March 2008, the Virginia Department of Conservation and Recreation approved the county's program finding it to be "fully consistent with the requirements of the Virginia Erosion and Sediment Control Law and Regulations."

In 2006, DPWES and the Engineers and Surveyors Institute conducted a class and workshop on constructability issues. In addition, in February 2006, a Letter to Industry was issued to announce the addition of two amendments to the PFM. The first clarified the requirements for drainage divides; the second clarified the adequate outfall requirements.

In 2007, 767 E&S plans were submitted and approved for projects that would disturb a land area of 2,500 square feet or more. Fairfax County's Alternative Inspection Program, established in cooperation with the DCR, resulted in 35,046 Erosion and Sediment control inspections, totaling over 2,920 inspections per month on average. In 2007, the county issued 208 notices of violations. Criminal proceedings were started in 22 cases.

6. Illicit Discharges

In 2007, the Hazardous Materials and Investigative Services Section of the Fairfax County Fire and Rescue Department responded to 315 complaints involving hazardous materials; 290 involved the spill, leak or release of hazardous materials into the environment. Of these 290 releases, 217 involved petroleum based substances. Other

releases involved antifreeze, paint, cleaners, various gases, various chemicals and mercury. Storm drains and waterways were involved in 60 of these releases.

F. WASTEWATER TREATMENT

Wastewater is primarily treated two ways in Fairfax County. In most cases it is collected from homes and commercial sites and carried through the sanitary sewer pipe system to large treatment facilities that release the treated waters into local waterways. For a small percentage of Fairfax County residents, wastewater is treated on-site via septic systems where the water infiltrates into ground and ultimately reaches groundwater.

1. Treatment Facilities

a. Upper Occoquan Sewage Authority

The following information has been provided by UOSA:

UOSA operates an advanced water reclamation facility in Centerville, Virginia and serves the western portions of Fairfax and Prince William counties, as well as the cities of Manassas and Manassas Park. The water reclamation plant includes primary-secondary treatment followed by advanced waste treatment processes: chemical clarification, two-stage recarbonation with intermediate settling, multimedia filtration, granular activated carbon adsorption, chlorination for disinfection and dechlorination. The plant's rated capacity is 54 million gallons a day.

UOSA operates under a Virginia Pollutant Discharge Elimination System Permit, which is issued by the Virginia Department of Environmental Quality. The permit limits and 2007 plant performance are listed in Table IV-1.

Table IV-1. UOSA Permit Requirements and 2007 Performance		
Parameter	Limit	Performance
Flow	54 mgd	28.5 mgd
Fecal Coliform	<2 / 100 mg/l	<1.1 / 100 mg/l
Chemical oxygen demand	10.0 mg/l	<5.0 mg/l
Turbidity	0.5 NTU	<0.1 NTU
Total Suspended Solids	1.0 mg/l	<0.1 mg/l
Total Phosphorus	0.1 mg/l	<0.1 mg/l
Surfactants	0.1 mg/l	0.010 mg/l
Total Kjeldahl Nitrogen	1.0 mg/l	0.2 mg/l
Dissolved Oxygen	>5.0 mg/l	7.6 mg/l
Dechlorination Chlorine Residual (mg/l)	Non detect	Non detect

Source: Upper Occoquan Sewage Authority

The influent highest rolling 30-day flow was observed during the 30-day rolling period ending on March 22, 2007 at 37.1 mgd. The UOSA Plant continues to produce high quality reclaimed water.

UOSA produces and treats two types of residuals: biosolids from conventional treatment and lime solids from chemical treatment. UOSA produces exceptional quality biosolids utilizing a dryer-pelletizer process. These biosolids have commercial potential in the horticultural and agricultural markets. As a back up to the exceptional quality biosolids process, UOSA produces Class B biosolids through a combination of digestion and dewatering or digestion and dewatering followed by lime stabilization. Thickened lime residuals are gravity thickened and dewatered on recessed chamber filter presses. All lime solids are disposed of on site in a permitted industrial landfill.

b. Noman M. Cole Jr. Pollution Control Plant

The NMCPCP, located in Lorton, is a 67 million gallon per day advanced wastewater treatment facility that incorporates preliminary, primary, secondary and tertiary treatment processes to remove pollutants from wastewater. The original plant, which began operation in 1970 at a treatment capacity of 18 million gallons a day, has undergone three capacity and process upgrades to meet more stringent water quality standards. After treatment, the wastewater is discharged into Pohick Creek, a tributary of Gunston Cove and the Potomac River. The plant operates under a VPDES permit. The plant is required to meet effluent discharge quality limits established by the Virginia Department of Environmental Quality. Table IV-2 presents the facility's performance and current effluent monthly limitations.

Parameter	Limit	Performance
Flow	67 mgd	40.1 mgd
CBOD ₅	5 mg/l	< 2 mg/l
Suspended Solids	6 mg/l	2.0 mg/l
Total Phosphorus	0.18 mg/l	0.10 mg/l
Chlorine Residual	0.008 mg/l	< 0.008 mg/l
Dissolved Oxygen	6.0 mg/l (minimum)	8.8 mg/l
pH	6.0-9.0 (range)	7.0
E. coli Bacteria	126/100mls*	< 1/100mls*
Ammonia Nitrogen	1.0 – 2.2 mg/l (seasonal)	< 0.12 mg/l
Total Nitrogen	No Limit	5.4 mg/l

In 2007, 53,742 wet tons of sludge were generated and incinerated. Inert ash from the process was disposed of in a monofill at the county's I-95 campus.

In 2007, the Virginia Department of Environmental Quality issued a new general permit for nutrient discharge limits for sewage treatment facilities in Virginia's portion of the Chesapeake Bay watershed. These proposed changes will further limit nutrient discharges from the NMCCPCP and require substantial modifications by 2010. Design and construction of the new modifications have begun. The NMCCPCP has volunteered to comply with the phosphorus requirement five years early.

2. Septic System Permitting and Repairs

Approximately 24,121 homes and business are served by on-site sewage disposal systems in Fairfax County. The county's Health Department reported that, in fiscal year 2008, 138 new sewage disposal permits were issued for single family residences. There were 138 new sewage disposal systems installed, 57.9 percent were alternative type systems and 42.1 percent were conventional systems. Approximately 756 sewage disposal system repair permits were issued (repairs ranged from total replacement of the system to minor repairs such as broken piping or pump replacement). There were 3,207 septic tank pumps outs.

In fiscal year 2008, notices were sent to 13,421 homeowners to remind them to turn their system's flow diversion valve and pump out the septic tank every three to five years.

Sustainability of existing onsite sewage disposal systems and areas of marginal or highly variable soil remain concerns for future failing septic systems. Areas of the county with marginal or highly variable soils that were once deemed unbuildable in the past are now being considered for development utilizing alternative onsite sewage disposal technology. Alternative systems are also becoming the norm for developers who desire to maximize lot yield from properties. Alternative systems require more aggressive maintenance on a regular schedule for the systems to function properly. Some require maintenance contracts as part of the permitting process. Homeowners are not typically aware of their responsibilities for maintaining these systems. Education is essential for ensuring that maintenance is conducted to prevent system failure.

The Health Department is currently working with a private contractor to complete a feasibility study for the formation of an on-site sewage disposal management entity to ensure that proper and required maintenance are conducted on private on-site sewage disposal systems. The project is scheduled to be completed in 2008.

The Commonwealth of Virginia, State Board of Health is in the process of revising the state Sewage Handling and Disposal Regulations. Fairfax County Code Chapter 68.1 is being evaluated for possible future amendments to address changes in state regulations and alternative systems.

3. Sanitary Sewer Maintenance, Repairs and Rehabilitation

The Wastewater Collection Division within the Department of Public Works and Environmental Services manages the county's operation and maintenance program for the 3,300 mile sanitary sewer system. Closed circuit television inspection is used to inspect trunk sewer mains to identify defective lines in need of repair and/or rehabilitation. In 2007, 188 miles of old sewer lines and 15 miles of new sewer lines were inspected using CCTV. Approximately 32,000 feet of sanitary sewer lines were rehabilitated and 30 dig-up and 96 trenchless point repairs were completed. Over the past ten years, 239 miles of sewer lines have been rehabilitated.

G. DRINKING WATER

The county's water supply comes from the Potomac River, the Occoquan Reservoir, Goose Creek, community wells and private wells. Fairfax Water provides drinking water to most Fairfax County residents. Fairfax Water also provides drinking water to the Prince William County Service Authority, Loudoun County Sanitation Authority, Virginia America Water Company (City of Alexandria and Dale City), Town of Herndon, Fort Belvoir and Dulles Airport. However the City of Fairfax receives its water from the Goose Creek Reservoir in Loudoun County, and the City of Falls Church buys its drinking water from the Washington Aqueduct's Dalecarlia Plant on the Potomac River.

With the exception of some wells, water must be treated prior to use. Fairfax Water provided 61,493 billion gallons of drinking water in 2007.

Federal regulations require water suppliers to provide annual reports on the quality of the drinking water to their customers through the Consumer Confidence Report Rule. The 2007 Water Quality Report is available for review on the Fairfax Water Web site at www.fairfaxwater.org.

<u>Sources</u>	<u>Gallons (in billions)</u>
Occoquan Reservoir (Lorton/Occoquan)	27.356
Potomac (Corbalis)	33.460
Wells	0.000
Purchased	0.055
Untreated	0.131
TOTAL	61,002

Source: Fairfax Water

1. Wells

The Fairfax County Health Department has developed and maintains an extensive data base and GIS layer of all water well systems installed in the county. The Health Department permits and inspects all new well construction, existing well repairs, and well abandonments. In FY 2007 there were 126 new well approvals, 48 well repairs, and 467 total well samples taken.

The Virginia State Health Department Office of Drinking Water regulates 78 public well water supplies in Fairfax County. The operators of these systems are required to conduct quarterly water sampling and analysis.

Fairfax Water no longer operates public wells. All former well systems have been permanently removed.

There are approximately 12,500 single family residences and businesses that are served by individual well water supplies in Fairfax County. In 2006, 104 New Well Permits were issued for single family residences.

2. Source Water Assessments

The 1996 Amendments to the Safe Drinking Water Act provided for source water assessment and protection programs designed to prevent contamination to drinking water. Under SDWA, states are required to develop comprehensive Source Water Assessment Programs that identify areas that supply public tap water, inventory contaminants and assess water system susceptibility to contamination. Fairfax Water has completed an inventory of potential sources of contamination and a survey of land use activities within the Potomac and Occoquan Watersheds.

Fairfax Water's Source Water Assessment is available on-line at:
www.fairfaxwater.org.

3. Treatment Facilities

a. Occoquan Water Treatment Plant (Griffith WTP)

The Griffith plant is currently treating 120 million gallons per day (mgd). The plant is designed for an ultimate capacity of 160 mgd. In addition to flocculation and sedimentation, the Griffith Water Treatment Plant includes advanced treatment processes of ozone disinfection and biologically active, deep bed, granular activated carbon filtration.

b. Potomac Water Treatment Plant (Corbalis WTP)

The Corbalis plant, located near Herndon, is currently treating up to 150 mgd taken from either an onshore or offshore intake on the Potomac River. A third 75 mgd

phase, which will bring the plant capacity up to 225 mgd, is currently under construction and scheduled to be in service in 2008. The plant is designed for an ultimate capacity of 300 mgd. The plant uses ozone as a primary disinfectant, flocculation-sedimentation, biologically active filters with carbon caps and chloramine final disinfection.

c. Water Quality Monitoring at Corbalis and Griffith Plants

Trihalomethanes are by-products of chlorination water treatment and are suspected carcinogens at elevated levels. The 2007 distribution system averages continue to be below the federally mandated Maximum Contaminant Levels for total trihalomethanes. In addition to the TTHMs, haloacetic acid levels, another by-product of chlorination, continue to be below the required MCL. The presence of chlorine in drinking water supplies remained below the required Maximum Residual Disinfectant Level. Fairfax Water also tests for the following regulated elements: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, copper, iron, lead, manganese, magnesium, mercury, nickel, potassium, selenium, silver, sodium, thallium and zinc. The levels of these metals in 2006 continued to be below their MCLs. The concentration levels for unregulated metals were within the expected range. Test results are available on-line at: <http://www.fairfaxwater.org>.

4. Tap Water Monitoring

In 2007 Fairfax Water monitored 3,302 taps for coliform bacteria. The monthly monitoring results were within EPA required limits. Fairfax Water also monitored surface source water and finished drinking water for 42 volatile organic compounds and 39 synthetic organic compounds. No SOCs or VOCs were detected except in the finished waters where TTHMs (a subset of VOCs) were detected. Additional information on these programs and more can be found at: www.fairfaxwater.org.

5. Regional Cooperative Water Supply Agreements

In order to protect the Potomac River ecosystem during low flow periods, the three major water utilities in the Metropolitan Washington area developed water allocation agreements for water use during low flow periods. Two upstream dams, Jennings-Randolph on the Potomac River and the Savage River Dam, along with Seneca Lake in Montgomery County, Maryland, are storage facilities for drinking water supplies during low flow periods. While the Potomac River has flows that average above 7,000 million gallons a day, the river has often reached flows well below that, usually in late summer and early fall. The lowest recorded flow in this region was 388 mgd at Little Falls in September during the drought of 1966. This is an adjusted figure that does include the withdrawal allocation of 290 mgd (e.g., with the adjustment, the flow would be 98 mgd). In 1981, the three major metropolitan water utilities, including Fairfax Water, signed the Low Flow Allocation Agreement, which creates a protocol for allocation of water from the Potomac during periods of low water. The current

environmental flow recommendations are 300 mgd downstream of Great Falls and 100 mgd downstream of Little Falls. In 2002, the Maryland Department of Natural Resources revisited this issue of the flow level necessary to support aquatic habitat in the Potomac River and was unable to replicate the methodology used to create the present low flow requirements in the agreement. Droughts that occurred in 1999 and 2002 called attention to the concern that these flows, derived by the 1981 study (which was conducted during a period without extreme low flows), needed to be revisited in light of new scientific methods and low-flow information. During the drought of 2002, the Maryland Department of Natural Resource's Power Plant Siting Program assembled teams of biologists from its staff and Versar, Inc, with assistance from Montgomery County, Maryland and the Interstate Commission on the Potomac River Basin, which performed habitat assessments during that year's low flow conditions.

On April 8, 2003, the Maryland Power Plant Research Program and the Interstate Commission on the Potomac River Basin sponsored a one-day workshop with a panel of nationally recognized experts on habitat assessment to investigate and develop methods to evaluate the environmental flow-by requirements. Their conclusion of the present low-flow agreement is that: "Existing biological data and understanding are inadequate to support a specific, quantitative environmental flow-by." At this workshop, members of the special panel collectively considered and debated the various methodologies applicable to the Potomac River to address the flow-by issue. The final product of the workshop is a set of recommendations for 1) the best method or approach, given current financial resource limitations, to address the Potomac Flow-by Study objectives and the level of confidence associated with their recommendations and 2) an alternative long-term method or approach which could better accomplish those objectives, yet might exceed current resources or available data, and recommended guidelines for achieving the objectives in a longer time-frame.

In September 2003, the Maryland Department of Natural Resource's Power Plant Siting Program issued a report entitled *Habitat Assessment of the Potomac River From Little Falls to Seneca Pool (Final Document #PPAD-03-1)*, which provided substantial background information describing the history of current low-flow requirements, a review of the studies conducted to support those requirements and a report on habitat assessment conducted during low-flow conditions in 2002. The assessment included development of a habitat map, a field survey of habitat types and measurements of hydraulic and water quality conditions, spanning the period of July through October 2002 when flows were as low as 151 million gallons per day at the gage at Little Falls Dam.

In November 2004, ICPRB convened an update meeting to discuss recent developments in USGS mussel studies and further defining desired hydrological regimes. The next step will be a workshop with regional and national aquatic biologists to develop targeted species and guilds for re-evaluating ranges of tolerance during low-flow events in the study area.

Full reports on these activities can be viewed at:
www.esm.versar.com/pprp/potomac/default.htm.

In December 2005, Fairfax Water adopted a revision to the Occoquan Reservoir Shoreline Easement Policy, which places limits on what may be done within the utility's easement surrounding the reservoir. The policy prohibits construction of any structures other than piers and floats. Removal of any vegetation, storage of fuels or chemicals, application of pesticides and placement of debris are also prohibited in this area. The policy is intended to protect the reservoir's riparian buffer.

The State Water Control Board's Water Supply Planning Regulation (9 VAC 25-780) requires all cities and counties in the commonwealth to submit water supply plans to the Virginia Department of Environmental Quality. Each water supply plan must include a description of existing water resources and water use, projected demands, a description of water management actions/conservation measures, segment of need for future supplies and alternative analysis and local government resolution approving the plan. Fairfax County is participating in a Regional Water Supply Plan, which is required to be submitted to DEQ by November 2011.

a. Interstate Commission on the Potomac River Basin Cooperative Water Supply Operations

The ICPRB plays several important roles in providing for the region's current and future water supply needs. The Cooperative Water Supply Operations Section facilitates the agreement among the three major water utilities (including Fairfax Water) that requires water suppliers to coordinate resources during times of low flows in the Potomac River. The Water Resources Section also provides technical water resources management assistance to the jurisdictions throughout the basin. Flow in the Potomac River was more than adequate to meet drinking water withdrawal needs by the region's major utilities in 2007. No releases from upstream reservoirs to augment water supplies were needed in that time, and it is unlikely that releases will be needed for the remainder of 2008. In October 2007, ICPRB worked with the region's utilities and the U.S. Army Corps of Engineers to conduct several test releases from upstream reservoirs. These test releases provided useful data on how the river behaves during droughts and will help to make drought management activities more efficient in the future.

The ICPRB annually coordinates a weeklong drought management exercise that simulates water management operations and decision making under drought conditions for the Metropolitan Washington area. Annual simulation allows for renewal of coordination procedures with the water suppliers and other agencies, opportunities for public education and outreach and review and improvement of operational tools and procedures.

Information on water supply status, recent streamflow, reservoir storage, water supply outlooks and precipitation maps can be found in the publications section of the ICPRB Web site, www.potomacriver.org.

At the request of three large regional water suppliers (including Fairfax Water), ICPRB is initiating the next study on long-term regional water supply reliability. These studies are typically conducted every five years and the last report was published in 2005. The next report will come earlier than usual (a draft is planned for July 2009) in order to coordinate with the Northern Virginia Regional Commission's work on meeting Virginia's new water supply planning requirements. The study will use long-term population and development projections to forecast future water needs, and will evaluate whether current resources are adequate to meet those future needs.

The 2005 study is available on ICPRB's Web site.

b. Metropolitan Washington Council of Governments

In response to the droughts of 1998 and 1999, COG brought together a task force in May, 2000 to coordinate regional responses during droughts to reduced availability of drinking water supplies. The plan consists of two components: (1) a year-round plan emphasizing wise water use and conservation; and (2) a water supply and drought awareness and response plan. The Interstate Commission on the Potomac River Basin handles the administration of the coordinated drought response for water withdrawals from the Potomac River and during low flows. Additionally, the Cooperative Water Supply Operations Section works with COG and the Drought Coordination Committee to assist in providing accurate and timely information to residents during low-flow conditions.

COG is also looking at issues such as effects of chemical environmental pollutants, specifically endocrine disruptors, in the Potomac River and their impacts on wildlife and humans. COG staff is working with members and other stakeholders to organize workshops over the next year that will address subjects such as endocrine disruptors in the Chesapeake Bay watershed and contaminants of emerging concern in the Potomac and Anacostia Rivers.

c. NVRC Water Supply Plan

Work is underway by more than 20 local governments and the Northern Virginia Regional Commission on the first Northern Virginia Regional Water Supply Plan project. This is the first time that so many local jurisdictions and water supply utilities are working together on a region-wide project and this is the first Water Supply Plan that encompasses all municipalities in Northern Virginia.

The Northern Virginia Regional Water Supply Plan will include information on water sources, water use, water resource conditions, projected water demand, water

management actions and an analysis of alternatives, drought and contingency plans in the event of water deficits. The plan, expected to be completed in 2011, will include water supply projections for the next 30 years.

6. Emerging Contaminants of Concern

Fairfax County is undertaking a number of actions to deal with emerging contaminants of concern. The county uses advanced processes to treat wastewater. These processes can remove some of the chemicals and drugs being found in rivers and streams.

The county is closely following research on this issue, and has asked the state to conduct studies. The county supports regional efforts to monitor for chemicals in the Potomac River and works closely with water utilities, sewage treatment plants, and other regional agencies including the Metropolitan Washington Council of Governments and the Virginia Department of Environmental Quality. Fairfax Water is working on developing a testing protocol for treated water.

Fairfax County has developed an informational Web site as well as brochures and public service announcements on how to properly dispose of pharmaceuticals. For more information visit Fairfax County's Web site:
http://www.fairfaxcounty.gov/opa/chemicals_drugs_water.htm.

MWCOG staff monitors national and federal activities and initiatives regarding endocrine disrupters and emerging contaminants of concern and provides routine updates to the Water Resources Technical Committee. COG staff participated in Fairfax County's Pharmaceutical Disposal Technical Work Group.

The U.S. EPA conducts research on a number of emerging contaminants, including pharmaceuticals. The agency is working on improving potential health risks through outreach efforts promoting pollution prevention as a means to reduce the introduction of contaminants into the environment. Information can be found on EPA's Web site, www.epa.gov/ppcp.

H. REGULATIONS AND LAWS

1. The Virginia Chesapeake Bay Preservation Act and Regulations

The Virginia Chesapeake Bay Preservation Act was passed as part of Virginia's commitment to the second Chesapeake Bay Agreement's goals to reduce nonpoint source phosphorus and nitrogen entering the Bay. In November 2004, the Board of Supervisors adopted an amendment to the Comprehensive Plan to ensure it was consistent with the Act and satisfied all requirements. The amendment included revisions to text in the environment section of the Policy Plan as well as the incorporation of a Chesapeake Bay Supplement. In March 2005, the Chesapeake Bay

Local Assistance Board determined that the Comprehensive Plan, as amended, is fully consistent with the Chesapeake Bay Preservation Act and Regulations. The Chesapeake Bay Exception Review Committee was formed to hear requests for exceptions to the regulations. The Committee is composed of 11 county citizens appointed by the Board of Supervisors, one member from each magisterial district and two at-large members. As part of the exception review and approval process, public notice and a public hearing is required. In 2006, the committee heard and denied one exception request.

The Chesapeake Bay Program is a cooperative arrangement among three states (Virginia, Pennsylvania and Maryland), the District of Columbia and the federal government (represented by the Environmental Protection Agency) for addressing the protection and restoration of the water quality, habitats and living resources of the Chesapeake Bay and its tributaries. Each state determines how it will meet the various commitments, and the approaches to implementation often vary greatly among states. All streams in Fairfax County are tributaries of the Potomac River, which flows into the Chesapeake Bay.

2. Stormwater Legislation HB 1177

This legislation, signed on April 8, 2004 by Governor Warner, encourages jurisdictions to adopt stormwater management ordinances that use the concept of Low Impact Development to the maximum extent practicable. The bill also transferred regulatory authority of the National Pollutant Discharge Elimination System programs associated with municipal separate storm sewer systems and construction activities from the State Water Control Board to the Soil and Water Conservation Board and transferred oversight of these programs from the Department of Environmental Quality to the Department of Conservation and Recreation. As a result, DCR is responsible for the issuance, denial, revocation, termination and enforcement of NPDES permits for the control of stormwater discharges from municipal separate storm sewer systems and land disturbing activities under the Virginia Stormwater Management Program. The legislation allows the state to transfer the administration of the Erosion and Sedimentation permitting for land disturbing activities to jurisdictions, allows these jurisdictions to charge permitting fees for review and establishes that jurisdictions must transmit 30 percent of these fees to the state.

3. Virginia Stormwater Management Program

New provisions of the VSMP permit program will transfer from the state to the county new responsibilities for the administration, monitoring and enforcement of stormwater impacts in the Chesapeake Bay Watershed. The county is in negotiations with DCR and the regulations are expected to be finished by 2009.

Information on legislation and proposed changes is available on-line at:
<http://www.dcr.virginia.gov/lawregs.shtml>

I. PROBLEMS

Fairfax County streams and watersheds continue to be impacted by several problems, including uncontrolled stormwater runoff, erosion, high levels of bacteria and sedimentation. Progress has been made with modifications to the Policy Plan section of the county's Comprehensive Plan; watershed and stream protection, however, need to be maximized in land use planning and site design decisions. The cumulative effects of land use decisions on Fairfax County's streams still need to be effectively considered. Only a few streams, such as Walney Creek in E. C. Lawrence Park, remain undisturbed and excellent examples of healthy streams in Fairfax County.

Stormwater runoff and erosion continue to have the greatest detrimental impacts on Fairfax County streams. **A key requirement for controlling stormwater discharge is to limit post development runoff to that which does not exceed pre-development runoff rates.** Most Fairfax County streams have increased runoff flows that exceed the capacities of their stream channels. This has created an ongoing erosion cycle that includes eroding stream banks, heavy sediment loads and sediment-smothered stream bottoms. Streams can become damaged by the changes brought about by changes in stream hydrology and increased flow during the pre-development clearing phase. The stream sees an overall increased flow due to the increased runoff caused by the clearing. This is not just the increase in peak flow, but the increase in the total volume of the water entering the stream. These increased flows start the cycle of damage, and once the stream is damaged it may take years or decades for the stream banks to revegetate and restabilize. This has resulted in erosion problems throughout the county that impact trail systems, homeowners' back yards, parks, utilities and infrastructure. Sediment on stream bottoms results in reduced habitat and diversity, which compromises the stream ecology and food chains.

Sediment also compromises the quality of, and increases the expense of, treating surface drinking water supplies. Poor land use planning, inadequate enforcement of erosion and sediment control laws and inadequate stormwater management have significantly contributed to erosion problems and impaired water quality. Prevention of such damage would not only be good for the environment but would also be cost effective. Strict monitoring and enforcement of adequate stormwater management and erosion and sediment controls prior to construction can help prevent damage from erosion and sediment.

In addition to problems created in streams, runoff and erosion have resulted in numerous ponds and lakes having enormous sediment deposition. Stormwater management ponds are designed to protect downstream water quality. Ponds also provide additional amenities including recreation (boating, fishing), aesthetics and wildlife habitat. Depending on the size of the surrounding drainage area, the land uses in that area and the volume of runoff, a pond can fill up with sediment, trash and organic debris in a relatively short period of time. Although dredging is a necessary management component to remove accumulated materials and help protect water quality downstream, private pond owners are experiencing increasing difficulty conducting dredging operations given the significant expense and lack of local, adequate disposal areas.

Much credit needs to be given to Fairfax County for its comprehensive watershed management efforts, including stream restoration and protection, adequate monitoring of water resources and adding new tools such as LID and other innovative practices to its stormwater management program. All of these efforts indicate a significant change in county policy and practice towards the protection and restoration of county streams. However, as long as the rate of stream degradation surpasses stream protection and restoration efforts in Fairfax County, the trend will continue to be a downward one.

J. ACCOMPLISHMENTS

Over the past several years, Fairfax County has demonstrated a clear commitment to improve, restore and protect the county's water resources.

- In February 2008, the Board of Supervisors adopted an amendment to the county's Policy Plan to strengthen comprehensive plan guidance regarding the protection and restoration of streams and buffer areas along stream channels upstream of Resource Protection Areas and Environmental Quality Corridors. This new guidance augments the EQC policy by explicitly encouraging stream and buffer area protection and restoration in headwater areas.
- The Environment Agenda (Environmental Excellence for Fairfax County: 20-Year Vision) adopted in 2004 continues to have significant impacts on water quality protection and environmental stewardship efforts in the county. In 2006, in response to the Board of Supervisors' directive for follow up action on the plan, the Environmental Coordinating Committee initiated its annual preparation of a Environmental Improvement Plan. The EIP addresses environmental and policy needs and assists county officials in making decisions regarding environmental funding and project planning. The EIP supports environmental initiatives and objectives identified in the Environmental Agenda. The ECC anticipates updating the EIP annually prior to the development of the county budget to provide sufficient time for funding decisions. Additionally, the plan will report on progress made and additional needs. Information on the EIP FY 2009 projects and plans may be found on-line at: <http://www.fairfaxcounty.gov/living/environment/eip/>
- In February 2006, the Board of Supervisors adopted amendments to the Public Facilities Manual's provision for adequate drainage. The amendments provide greater protection to receiving streams and areas downstream from areas being developed. The county requires that plans proposing land-disturbing activity must include an analysis of the adequacy of all outfalls from the site during the construction phase in addition to the requirements already in place for the developed site. This analysis helps decrease adverse impacts to outfalls and receiving streams during construction.
- In 2007, the Board of Supervisors adopted six low impact development practices (bioretention basins and filters, vegetated swales, tree box filters, vegetated roofs, permeable paving and reforestation) for inclusion in the Public Facilities Manual.

- The county continued developing and completing watershed management plans for each of the county's 30 watersheds. Six watershed management plans have been approved by the Board of Supervisors. It is anticipated that plans for the remaining watersheds will be completed in 2010. These plans will serve as guidance for all stream restoration and protection efforts in the county. Implementation of these plans is estimated to occur over the next twenty-five years.
- At times, high levels of fecal coliform bacteria, particularly *E. coli* bacteria, occur in various streams throughout the county. The county continues to expand its public outreach efforts to increase awareness about high fecal coliform bacteria counts in the county's waterways and potential health hazards from coming in contact with impaired surface waters.
- In 2006 the Fairfax County Park Authority revised its policy for evaluating all forms of stormwater related projects to include conservation easements, stream restoration, stream buffer enhancement, LID facilities and stormwater ponds.

K. COMMENTS AND ONGOING CONCERNS

1. EQAC commends the Board of Supervisors for its actions the past four years authorizing one penny of the real estate tax to be dedicated to the stormwater management program. The amount increased from \$22.7 million for FY 2008 to \$22.8 million for FY 2009. This additional funding from the penny is a significant contribution to implementing the recommendations outlined in the county's comprehensive watershed management plans, including retrofitting and rehabilitating existing and aging stormwater management facilities and infrastructure. However, based on budget constraints in the FY 2009 budget, \$8.7 million of staff support, equipment and materials was shifted from the general fund to the penny (Fund 318). This 38 percent decrease in funding effectively cuts and delays future stormwater project implementation. EQAC continues to encourage the creation of a sustainable and stable funding source for watershed improvement initiatives.
2. EQAC commends the county for developing and adopting amendments to the Public Facilities Manual's provision for adequate drainage that require analysis of adequacy of outfalls during the construction phase. This is another enforcement tool that will protect streams during the construction phase. However, EQAC cannot over-emphasize the importance and need for increased monitoring of predevelopment stormwater management controls and for enforcement action to ensure inadequate controls are corrected prior to construction and, if necessary, during construction. It is also important that the county hire the appropriate number of staff to handle the estimated inspection workload.
3. EQAC continues to support the full funding and implementation of the comprehensive countywide watershed management program. EQAC strongly endorses the ongoing work of county staff on the watershed planning and public outreach efforts and the

comprehensive stream monitoring program. EQAC continues to support continued assessments of watersheds and development of a stream protection and restoration program that has adequate sustainable funding. EQAC continues to stress that equal importance should be devoted to environmental protection, restoration and monitoring as compared to infrastructure improvement and maintenance.

4. EQAC commends the county for its existing stream protection requirements for perennial streams. EQAC thanks the Board of Supervisors for their recent efforts to protect intermittent and headwater streams by the establishment of protective buffers.
5. EQAC is pleased to note the MS4 requirement to develop a long-term watershed monitoring program to verify the effectiveness and adequacy of stormwater management goals and identify areas of water quality improvement or degradation is being implemented. While EQAC understands that a comprehensive countywide program to monitor effectiveness can be cost-prohibitive, data are still needed, as it is still unclear as to which structures and requirements are effective and working well.
6. EQAC continues to encourage Fairfax County (the Board of Supervisors, the Planning Commission, the Board of Zoning Appeals, the Fairfax County Park Authority and various county agencies) to coordinate efforts and develop a protocol for assessing the impacts and cumulative effects of land use considerations and decisions on the county's water resources. EQAC urges these groups to use and disseminate information to protect the county's watersheds. EQAC commends the Board of Supervisors for adopting Residential Development Criteria that include supporting the provision of adequate outfall drainage and innovative water quality measures.
7. As sedimentation of stormwater management ponds from upstream bank erosion continues, the need to dredge facilities becomes more frequent. Facility owners are having difficulty conducting necessary dredging operations given rising expenses and lack of local, adequate disposal areas. EQAC commends the county for establishing an interagency work group to explore options, such as creating spoil disposal/recycling areas in various parts of the county to assist private facility owners and help protect water quality. EQAC is pleased that staff will investigate the pros and cons of dredging, hauling, and disposal options and will present its findings and recommendations to the Board of Supervisors.
8. Given the anticipated increase in the number of small individual LID facilities that will be installed throughout the county, EQAC recognizes that the county will have an additional challenge of developing a program to track, inspect and ensure adequate maintenance of these LID facilities.
9. More than 12,000 single-family residences and businesses are served by individual well water supplies in Fairfax County, and approximately 30,000 homes and businesses have septic systems that ultimately infiltrate into groundwater. Areas of the county that have been unbuildable in the past now are now being developed and are using alternative onsite sewage disposal technology. These alternative systems are often more difficult to

maintain and are therefore subject to failure. The Health Department staff and the American Water/Applied Water Management are developing a report, which will establish a framework for ensuring that proper and timely septic system maintenance is preformed. EQAC continues to support this effort and recommends that this report include requirements that owners with alternative septic systems be required to file a maintenance plan for their systems and provide evidence of compliance.

L. RECOMMENDATION

1. The single most important thing Fairfax County should do is to continue to adequately fund and implement its ongoing water resource monitoring, management, restoration and educational stewardship programs. EQAC realizes the current budget constraints have effectively removed 38 percent of the programs and projects funded by the penny (Fund 318) by shifting operations costs from the General Fund to Fund 318.

While EQAC understands the reason for this during current constrained budget times, EQAC would like to see operations removed from the penny and restored to the General Fund as a line item. This would result in the restoration of funds for watershed improvement programs and a realistic infrastructure replacement timeline.

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ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER V

SOLID WASTE

V. SOLID WASTE

A. ISSUES AND OVERVIEW

Fairfax County's Solid Waste Management Program experienced a truly successful and productive year in FY 2008. Expansion of the recycling program was the primary focus of the program this year, as changes to Chapter 109.1 of the Fairfax County Code were implemented requiring everyone in the county to recycle. This focus on recycling resulted in an increased recycling rate of 38 percent of all waste generated in Fairfax County, exceeding the state requirement of 25 percent. As always, the county met its minimum annual waste delivery obligations to Covanta Fairfax Inc., owner and operator of the I-95 Energy/Resource Recovery Facility. During this year, the SWMP also provided waste collection and recycling services to over 45,000 homes in designated County Sanitary Districts and moved a daily average of 200 tractor-trailer loads of municipal solid waste from the I-66 Transfer Station to the E/RRF or other appropriate disposal locations.

1. Energy/Resource Recovery Facility and Landfill Capacity

The E/RRF continued to serve as the primary disposal location for county MSW, processing approximately 1,030,000 tons of waste in FY 2008. This is a decrease of 2.7 percent from the FY 2007 level. Due to increased availability at the facility and management of the tipping floor, the county had to bypass less than 3,000 tons of waste to an MSW landfill. This also reflects our efforts to keep waste at the facility, if at all possible, to reduce trucks having to haul materials downstate.

Due to capacity availability, the E/RRF was able to accept an increased amount of waste from neighboring jurisdictions outside the county. Approximately thirteen percent of waste sent to the E/RRF was from local jurisdictions such as Prince William and Loudoun Counties and the District of Columbia. The remaining tonnage of waste processed at the facility was generated in Fairfax County.

2. Solid Waste Management Plan Implementation

The Solid Waste Management Plan was approved by the Board of Supervisors in 2004. Highlights of the implementation actions include:

a. Additional Clarifications and Revisions to the Solid Waste Management Ordinance

A revision was made to the county's solid waste management regulations (formerly Chapter 109), now found in Chapter 109.1 of the County Code. The new ordinance updated and clarified certain provisions. The clarifications:

- Reestablished county control of waste destined for disposal outside the state;
- Required collectors using single-stream recycling to identify the vehicles as recycling vehicles when performing that function;
- Extended time limits for temporary permits;

- Required all collectors to provide a Statement of Service to their customers;
- Defined terms such as collector and brush; and
- Aligned parking controls on collection vehicles to match those of the police.

b. Non-Residential and Multi-Family Residential Recycling Requirements.

The SWMP continues to implement the nonresidential and multifamily property recycling requirements that went into effect in July 2007 as defined by the changes to Chapter 109.1. To accompany the implementation of the new recycling requirements of the code, changes were made to the county Public Facilities Manual. The PFM is the document that defines all of the site design requirements for new buildings in Fairfax County. The change was necessitated to delineate design requirements for outdoor trash and recycling containers or dumpsters for new construction.

The new PFM requires that engineers and architects ensure that adequate space is allocated on the site for both a trash container and a recycling container. The containers must be of appropriate size to store the volume generated by businesses on the property. Adequate space must be allocated on the site for trucks to approach the container and empty it safely. Building site plans must show the dimensions and location of the container area and this information must be submitted to the Department of Public Works and Environmental Services' Division of Land Development Services for approval prior to construction. These changes are intended to ensure that an area adequately designed and sized for trash and recycling collection is available for storage in a safe and clean manner.

c. Resources for Recycling Construction/Demolition Debris

Chapter 109.1 required that beginning July 1, 2007, construction and demolition contractors must recycle corrugated cardboard. Education activities have been underway to inform companies of the new requirement and to educate their customers about the need to recycle.

d. Remote Household Hazardous Waste (HHW) Collection Events

In addition to its permanent collection sites at the I-66 and I-95 complexes, the SWMP conducted five remote HHW events during FY 2008. The collection events were held at locations in the Mount Vernon, Mason, Dranesville, Hunter Mill and Springfield Districts. These remote events are part of the county's Environmental Improvement Program and are dependent upon separate funding by the Board of Supervisors on an annual basis.

e. Environmental Excellence. The SWMP continued to maintain its Environmental Enterprise (E2) certification with the Virginia Environmental Excellence Program, administered by the Virginia Department of Environmental Quality.

Other Solid Waste Management E2 goals and objectives for 2009 include the following:

- Continue to support a progressive policy through which currently 14 employees telecommute (28 percent of eligible employees).
- Maintain involvement with the Businesses for the Bay Certification Program.
- Continue to celebrate Earth Day as well as support Virginia Recyclers Association’s designation of April as Electronic Recycling month.
- Continue with the Noman M. Cole Pollution Control Plant evaluation of using the effluent as a source of water for the E/RRF.
- Continue to sponsor at least four community recycling events and, where possible, include computers and peripheral equipment, cellular telephones, rechargeable batteries, bicycles and eye glasses are reused and recycled. These recycling events are conducted in partnership with a variety of non-governmental organizations and private businesses.

Accomplishments of E2 Program in FY 2008

Continued to operate six hybrid vehicles and two electric vehicles, reducing air emissions from the operating fleet.

Continued to work for a new landfill gas-to-energy project at the closed I-66 Landfill and Vehicle Repair Facility.

Continued to operate two LFGTE projects at the I-95 Landfill complex and the newest LFGTE space heat project.

Held five E-waste and specialty recycling events in 2007. Collected approximately 100 tons of obsolete electronic equipment and other usable items that were donated to charity.

Held three Conditionally Exempt Small Quantity Generator events, collecting a total of 8,610 pounds of Hazardous Waste.

Held five remote HHW collection events, in addition to two permanent drop-off centers.

Worked with property managers to educate them about new recycling requirements.

Expanded recycling in county buildings by providing new containers to collect cans and bottles.

Determined that the project designed to have the E/RRF provide emergency backup power for the Fairfax Water plant and the NMCPCP was not cost effective and ended the project.

f. Solid Waste Management Award from the Solid Waste Association of North America.

Fairfax County’s SWMP was awarded a national excellence award from the Solid Waste Association of North America. The award is for excellence in the category of “Integrated Solid Waste Management Systems” where the county was

recognized for its superior performance in the management of the entire countywide solid waste management program.

3. Solid Waste Disposal Fee

The contract waste disposal fee, offered to companies that sign agreements with the county, increased to \$49.95 in FY 2008. Due in part to losing its General Fund support for the programs such as recycling education and household hazardous waste, the SWMP was forced to increase its solid waste disposal fee by 10 percent to \$55.00 for FY 2009. The county posted an explanation of the impact of the disposal fee increases, about \$1.00 per household per month, on its Web site. Prices for disposal at the citizens' facilities remained at \$57 per ton. A complete list of fees for various materials is posted on the county's Web site and at the facilities.

Due to a significant reduction in use, prepaid punch cards that could be purchased by residents were discontinued beginning July 1, 2008. The administrative costs of the program were too high for the small number of residents using the cards.

B. PROGRAMS, PROJECTS AND ANALYSIS

1. Waste Disposal Program

a. I-95 Landfill Complex and Citizens Disposal Facility

i. Groundwater Monitoring

Groundwater Protection Standards were established for the I-95 Landfill complex on November 20, 2000, through an amendment to the facility permit. In accordance with Waste Management Regulation 9 VAC 20-80-250.D.6.g, an Assessment of Corrective Measures report was submitted to VDEQ in August 2002. VDEQ commented on the ACM and the county addressed VDEQ's comments by submitting a revised ACM and Corrective Action Plan on April 30, 2004. The reports describe the nature and extent of groundwater contamination, provide a risk assessment for these conditions and establish a proposed program of corrective action. The county has proposed to implement a five-part remedy for groundwater at the I-95 Landfill complex. Proposed components of the program consist of:

- Institutional controls;
- Engineering controls;
- Monitored natural attenuation;
- Accelerated bioremediation (reductive dehalogenation); and
- Direct oxidation.

The county will implement institutional controls in accordance with the closure and post-closure care plan. A variety of engineering controls (leachate collection, landfill gas system and placement of cover) will be used. As

presented in the ACM, the concentration of most regulated constituents began to attenuate relatively abruptly after engineering controls were implemented during the 1990s. Natural attenuation will be enhanced by injection of food grade material that will enhance microbial activity via reductive dehalogenation. Direct oxidation will be employed in one area of the facility. Two common forms of permanganate (potassium and sodium) will be used. Both are strong oxidizing agents. This will be done in the selected areas. A Corrective Action Monitoring Plan has been submitted to VDEQ along with the Corrective Action Plan. The county will implement the CAP after final approval from VDEQ.

As part of the investigation, the county has drilled and sampled 16 additional monitoring wells to further delineate and remediate any groundwater problems. Staff will continue to perform the groundwater monitoring to comply with VDEQ's requirements of assessment monitoring. Further, staff will monitor the additional parameters at supplemental locations as specified in the CAP.

These proactive steps will be used at the I-95 Landfill to assure protection of the groundwater resources. These advanced steps are believed to be among the first used at a Virginia landfill. The county continues sampling and monitoring the groundwater and is in compliance with VDEQ's regulations.

ii. Landfill Closure

Capping of the municipal solid waste section of the landfill (an area of 260 acres) has been completed. Phase II of the closure consisted of capping 135 acres of landfill with a thick, low permeability soil layer to minimize surface water infiltration. Phase I of the MSW closure was completed by placing synthetic cap over an area of 125 acres. Additional landfill gas control systems were installed as part of the closure design. The project was awarded Project-of-the-Year by the VA-DC-MD Chapter of the American Public Works Association in 2007.

Partial closure of the ash landfill continued during FY 2008. Side-slopes of filled cells are capped by using a synthetic landfill cap.

iii. Landfill Gas System and Air Emissions

The I-95 Landfill operates one of the largest LFG collection systems in Virginia, with over 330 installed wells extracting LFG for energy recovery. Approximately 3,000 cubic feet per minute of this LFG is distributed to a variety of energy recovery systems, including the six-megawatt Michigan Cogeneration Systems electric generating facility and the three-mile LFG pipeline that provides fuel as a substitute for natural gas at the Noman M. Cole Pollution Control Plant. The LFG pipeline project continues to provide significant energy cost savings at the NMCPCP.

During FY 2008, county staff continued to install new landfill gas wells to replace existing wells that cease to function properly due to normal landfill settlement.

County staff has also converted space heating at the landfill shop facility to LFG (the original heating system used bottled propane gas). This conversion is expected to save approximately \$6,000 per year in heating costs. In 2006, the project received a National Award from the U.S. Environmental Protection Agency's Landfill Methane Outreach Program.

During the reporting period, the county continued its solid compliance history with Virginia's air pollution and LFG control regulations. Quarterly methane gas surface emission and perimeter monitoring were conducted as required, and annual air emission reports were submitted to the VDEQ. VDEQ has found all submittals to be acceptable.

iv. Ash Landfill

Ash resulting from the E/RRF combustion process reduces the processed waste to only 10 percent of its original volume and about 25 percent of its original weight. Therefore, ash disposal requires significantly less landfill space than that which is consumed by the disposal of raw MSW. Incinerator ash from the E/RRF, a similar Covanta facility serving the City of Alexandria and Arlington County and the NMCPCP are disposed at the I-95 Ash Landfill. Ash is placed in a double-composite lined landfill, controlled by state-of-the-art leachate collection and detection systems.



Phase IIB of the ash landfill (the third cell) began accepting ash in May 2005. Approximately 1,000 tons of ash is placed daily in the cell, which has capacity for ash disposal for over three years. Approximately 6,000 tons of shredded tires were used as a protective layer for the cell. Using this material not only

recycled the tires, but also saved approximately \$86,000 in the cost of gravel and other aggregate materials. Construction of Phase IIIA of the Ash Landfill has been completed and the county is awaiting approval from VDEQ. Phase IIIA will support five years of as disposal capacity.

The E/RRF's suite of pollution control equipment includes a dolomitic lime system that chemically treats the ash to reduce the possibility of metals leaching from the ash after landfilling. During FY 2008, ash produced at the

Covanta facilities was analyzed by an independent lab and was found to be within the regulatory limits for all constituents (i.e., it is non-hazardous).

A metallic constituent of the E/RRF's ash of particular concern is cadmium. The SWMP supports and actively publicizes efforts to collect rechargeable nickel-cadmium batteries separately for recycling. Through a partnership with the Rechargeable Battery Recycling Corporation, large retailers such as Wal-Mart, Radio Shack and Best Buy are collecting old batteries as new ones are sold. The batteries are recycled at a permitted waste management facility specifically designed to recover these metals. This effort is anticipated to significantly reduce the amount of cadmium present in E/RRF ash.

v. Citizens Disposal Facility

The CDF allows county residents and small businesses to bring their MSW directly to the I-95 Complex for disposal. The CDF offers a full range of recycling opportunities, as well as household hazardous waste disposal service. Recycling is free to residents. In FY 2008, users visited the I-95 CDF over 75,000 times.

b. Energy/Resource Recovery Facility

i. Overview



E/RRF operations continue to meet or exceed accepted industry standards, as evidenced by the annual independent engineering report prepared by Dvirka and Bartilucci Consulting Engineers in November 2007.

This report states, “CFI has complied with the requirements of the Service Agreement, as amended, and has complied with the Facility’s various environmental permit and regulatory obligations.”

The E/RRF requested and was approved by the State Commerce Commission to generate and sell over 80 megawatts of electricity to be sold to Dominion Virginia Power. This change allows Covanta Fairfax, the facility owner, to take advantage of technology and process improvements to generate more electrical power for the grid, using essentially the same amount of waste. Steam that was previously dumped and not used can now generate an additional 5 to 8 megawatts to be sold. Revenue from the sale of electricity is used to keep the disposal fees low.

During March 2008 the facility underwent a cold iron outage to inspect and repair several infrastructure items within the facility that cannot be repaired when any of the combustion trains are operating. Significant work was done to plant valves, dump condenser and tank cleanout.

ii. Quantity of Waste Processed

The county has guaranteed to provide and the E/RRF has agreed to process at least 930,750 tons of MSW per year. In FY 2008, the E/RRF processed approximately 1,030,000 tons of waste (almost 86,000 tons per month). Approximately 893,000 tons of this waste originated in Fairfax County, with the remainder coming primarily from Prince William County and the District of Columbia. The quantity of Fairfax County waste generated has been reduced, partly due to increased recycling initiatives, the economic slowdown and dry weather conditions.

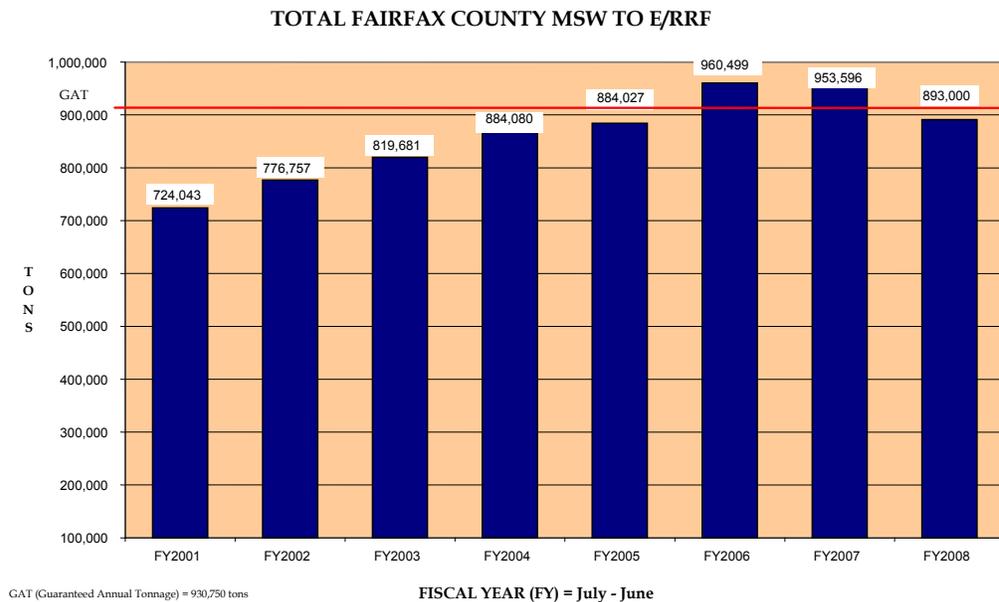


Figure V-1. Total Fairfax County Municipal Solid Waste to E/RRF FY2001-2008

iii. Air Quality

The E/RRF’s continuous emissions monitoring system samples flue gas from the combustion process and alerts Covanta operating personnel when emissions are approaching the concentration limits specified in the facility’s air pollution control permits. Permit excesses must be reported to VDEQ, with an explanation as to the circumstances of the event and proposed solutions, as warranted. The E/RRF continues to operate well under its air permit limits. The following stack emissions were documented by an independent lab test in June 2007 and reported to VDEQ.

Table V – 1 Energy/Resource Recovery Facility Emissions Results June 2007		
Parameter	Permit Limit	Average E/RRF Result
Sulfur Dioxide (SO ₂)	29 ppm	5.25 ppm
Carbon Monoxide (CO)	100 ppm	6.5 ppm
Nitrogen Oxides (NO _x)	205 ppm	194.75 ppm
Hydrochloric Acid (HCl)	29 ppm	10.64 ppm
Particulate Matter (PM)	27 mg/dscm	4.66 mg/dscm
Mercury (Hg)	0.080 mg/dscm	0.00178 mg/dscm
Dioxin/Furans	30 ng/Nm ³	0.646 ng/Nm ³

ppm = parts per million
Dscm = dry standard cubic meter

mg = milligram

ng = nanogram

Covanta Fairfax, Inc, Annual Compliance Stack & RATA Test Reports, (COV Report No. 3194), 08/07/07

A similar stack test was conducted in June 2008, but the test results were not available.

iv. Material Recovery

In addition to recovering energy from MSW to generate electricity, metals are recovered from the ash residue and recycled. In FY 2008, 23,244 tons of ferrous metal were recovered from the ash and sold for recycling. A new non-ferrous process was installed this year and has yielded over 411 tons of non-ferrous metal.

c. **I-66 Transfer Station & Citizens' Recycling and Disposal Facility**



The I-66 Transfer Station continues to handle approximately 75 percent of the county's MSW destined for disposal. The Transfer Station consolidates waste delivered by individual collection vehicles into large transfer trailers, hauling these trailers over the road, primarily to the

E/RRF, for final disposal. As mentioned previously, an average of 200 loads were hauled from the facility each day in FY 2008. Primary benefits from this type of transfer system are a reduction in the number of vehicles traversing the county to reach the E/RRF and reduced operating costs for the county's solid waste management system as a whole. Further, the Transfer Station plays a pivotal role when waste needs to bypass the E/RRF to landfills; in FY 2008, approximately 3,000 tons of waste were hauled from the Transfer Station to alternative disposal

sites. VDEQ regulates the Transfer Station, and it is regularly inspected by this agency. During all inspections of the facility during FY 2008, VDEQ found the facility to be in full compliance.

i. Transfer Operations

The main responsibility of the Transfer Station is to move waste from northern and western parts of the county to the E/RRF. With increased development and population growth, waste collection companies are bringing more and more waste to the Transfer Station. Moreover, advanced technologies used by collection companies to control their costs have resulted in collection vehicles that deliver more waste per trip. As the daily tonnage being managed by the transfer operations has grown, the county has supplemented its fleet of tractor trailers with private trucking contractors.

The county vehicle fleet, including the transfer trucks at the Transfer Station, now uses ultra-low-sulfur diesel fuel. This reduces air pollutant emissions as much as possible while performing the mission of transporting increased amounts of waste.

An automated truck wash system has been installed in the existing truck wash building. The state-of-the-art system will better recover and recycle water, discharging minimal amounts to the sewer, while reducing manpower requirements to wash large vehicles. Other county vehicles, including waste collection vehicles, are washed here as well.

County staff is in the process of completing the conversion of the space heaters to use landfill gas at the Department of Vehicle Services shop near the closed I-66 landfill. The gas transmission pipeline and the gas conditioning system were installed during FY 2008. The space heater conversion work is proceeding with the project to be completed by late 2008. This project is expected to save \$50,000 annually on fuel cost.

ii. Citizens Recycling and Disposal Facility

The Transfer Station Complex also has one of the county's two Citizens' Recycling and Disposal Facilities, where residents and small businesses can self-haul their waste and recyclables. In FY 2008, users visited the I-66 CDF more than 300,000



Photo of the Citizens Disposal Facility under construction in April 2008

times. The CDF is undergoing construction to accommodate growing demands for disposal and recycling services at that location. New scales and booths, improved entrance and egress and more technology are planned in order to

improve customer service, increase capacity and reduce wait times. The construction work is expected to be completed by April 2009.

d. Household Hazardous Waste Program

The Household Hazardous Waste and the Conditionally Exempt Small Quantity Generator collection programs are operated by the Solid Waste Management Program; however, the statistics about the program results are provided in the Hazardous Materials chapter of this report.

e. Other Relevant Activities

All solid waste collection companies in Fairfax County must hold a Certificate to Operate and individual vehicle permits, both issued by the SWMP. Due to better definition of the type of work performed by companies and consolidation in the waste industry, the number of CTOs has decreased to 27 companies from a previous level of as many as 35 firms. An integral requirement of these permitting programs is that permitted collectors comply with all applicable provisions of Chapter 109.1, the county's solid waste management ordinance.

The SWMP has responsibility for enforcing Chapter 109.1 and to resolve any potential violations observed by Program staff. In addition to this responsibility, the SWMP also coordinates with other county agencies as necessary to lead enforcement of relevant provisions of other chapters of the County Code related to the solid waste management aspects of public health menaces, nuisance noise and debris landfills.

2. Waste Reduction and Recycling Programs

a. Overview

The SWMP's Division of Solid Waste Collection and Recycling assumes the lead role regarding the management and implementation of the countywide recycling program. VDEQ is responsible for establishing the regulations that require all municipalities in the commonwealth to recycle a certain percentage of the total volume (by weight) of MSW generated in the jurisdiction. These regulations are codified as 9 VAC 20-130-10, and Fairfax County is responsible for meeting a 25 percent threshold. Smaller communities, with low population or low employment statistics across the Commonwealth, are required to meet a lower threshold set at 15 percent. Reports documenting the recycling rate for the preceding calendar year are required to be sent to VDEQ each year in the spring. Fairfax County's recycling rate for calendar year 2007 was 38 percent, which represents a full three percentage points above the required rate of 25 percent.

Chapter 109.1 requires annual reports on the tonnages of recyclables collected by solid waste collection companies, nonresidential businesses and commercial establishments, material recovery facilities and other entities operating in Fairfax County. These reports are evaluated and their data compiled to calculate the

countywide recycling rate. Figure V-2 depicts the historical quantities of recyclables collected in the county since calendar year 2000. Since the recycling program's inception in 1988, the county has recycled over 6.5 million tons and continues to exceed the state-mandated requirement.

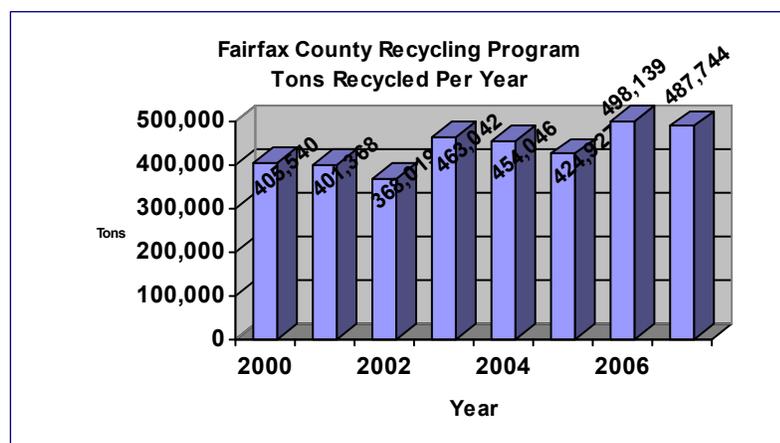


Figure V-2 - Historical Quantities of Materials Recycled in Fairfax County

Currently, all residential properties in Fairfax County receiving curbside trash collection must also be provided with recycling collection. Recyclables that must be collected at the curb, in conformance with Chapter 109.1, include: metal food and beverage containers; glass bottles and jars; plastic bottles and jugs; mixed paper; cardboard; and yard waste.

Recycling of mixed paper and cardboard is required for all nonresidential properties in the county. All nonresidential entities that generate a principal recyclable material other than mixed paper and cardboard are required to recycle that PRM in addition to the mixed paper and cardboard.

Recycling of mixed paper and cardboard is required for all multifamily buildings in existence prior to July 2007.

Recycling of mixed paper, cardboard, metal food and beverage containers, glass bottles and jars and plastic bottles and jugs is required for all multifamily buildings constructed after July 2007. Appliances from these properties are also required to be recycled.

Recycling of mixed paper and cardboard is required for all schools and institutions.

All construction and demolition contractors are required to recycle cardboard.

b. Changes for FY 2009

Fairfax County constantly reviews its solid waste management practices to stay abreast of the ever-changing waste generated within the county. Based on these community needs, the SWMP assesses new waste streams that are generated and attempts to provide solutions for managing new and problematic wastes. Two emerging waste streams have been identified by the SWMP and plans are in progress to ensure that these wastes can be appropriately managed. They are:

compact fluorescent lamps or CFLs (and other fluorescent lamps) and televisions with cathode ray tubes.

The management of CFLs and other fluorescent lamps from residences in the county is addressed in several ways. CFLs and other fluorescent lamps can be taken to either of the county's Household Hazardous Waste facilities at the I-66 Transfer Station complex in Fairfax or the I-95 Landfill complex in Lorton. Both of the facilities take these lamps at no charge to county residents. In addition, the SWMP has hosted five HHW collection events around the county for the past two years and is doing the same in calendar year 2008. These one-day events are intended to give residents a convenient way to properly dispose of these light bulbs.

The county has been fortunate to partner with Covanta Fairfax, LLC in a pollution prevention effort to address the potential contaminants in the CFLs. Covanta has donated funding to the SWMP to allow for the collection of CFLs at other collection events sponsored by the county. CFL collection will/has occur(ed) at the five roving HHW events as well as the electronics recycling and document shredding events held (or to be held) around the county in CY 2008. Nine of these events are planned around the county (five of them have already taken place). These events are intended to continue into future years.

Information about these events is placed on the county Web site and advertisements are placed in local newspapers to announce the service to residents. The SWMP has also prepared a brochure describing the energy-saving benefits of using these lamps and how to dispose of them properly at the end of their useful life. A copy of the brochure is available at <http://www.fairfaxcounty.gov/dpwes/publications/recycling/fluorescent.pdf>.

Staff continues to work to develop longer-term plans to make convenient disposal of CFLs available to county residents. This effort has been initiated and may include several approaches including collection in certain county buildings and partnering with commercial businesses to provide collection in their establishments. Additional approaches for collecting these materials may be developed in the future.

With the end of analogue television broadcasting pending in February 2009, the SWMP is in the process of addressing the disposal of televisions from residents who purchase new digital equipment. The SWMP is now accepting televisions at electronic collection events around the county. Three electronic collection events have been conducted in 2008 and about 400 televisions have been collected. This program is also funded by the generous support of Covanta and is intended to continue into the future.

The funding provided by Covanta has also allowed the electronic recycling program, the Keep It Green partnership with ServiceSource, to avoid asking residents for donations to support ServiceSource's efforts. Electronics recycling in Fairfax County has been accomplished through the Keep It Green program.

ServiceSource is a non-profit organization that finds employment for persons with disabilities. They partnered with a computer recycling firm that uses ServiceSource's labor pool to disassemble computers and peripherals. Since Covanta has provided funding to cover the donation to the Keep It Green program, electronics and televisions are now being collected at the events at no charge to county residents.

c. Review of Collection and Recycling Programs

In addition to county-wide recycling program management, the SWMP is responsible for the:

- Collection of refuse and recyclables from about 44,000 residences primarily on the east side of the county in designated areas entitled Sanitary Districts;
- Collection of refuse and recyclables from county-owned buildings;
- Seasonal curbside vacuum leaf collection for approximately 23,000 residences;
- The management of eight Recycling Drop-Off Centers;
- Refuse removal due to evictions and other court orders;
- Assistance in the removal of materials damaged by storm, floods or other emergency situations; and
- Public outreach and education on recycling, household hazardous waste and solid waste management.

The Megabulk program was originally established for county refuse and recycling customers in Sanitary Districts to collect oversized piles of refuse and yard debris. Customers schedule this service and pay an additional fee for the collection of oversized quantities of materials that are not part of the basic level of service for routine weekly collections. The service now is being made available to residents countywide, based upon equipment and personnel availability.

Working in conjunction with the Fairfax County Health Department, the SWMP's Clean Streets Initiative is designed to address complaints from residents about piles of refuse that are placed in neighborhoods where the property owner does not take responsibility for its timely removal, or where no responsible party can be found. Under CSI, the property owner is notified that the refuse must be removed. If the property owner fails to respond in a timely manner or refuses to cooperate, the SWMP removes the refuse and bills the property owner for removal of the material. If the property owner refuses to pay the county for the removal of the material, a lien is placed on the property.

i. Yard Waste

Recycling of yard waste (brush, leaves and grass) is required for all residential properties in Fairfax County. Curbside collection of yard waste is required to be provided by all refuse and recycling collection companies operating in the county, from March 1st through December 24th of each year. The revisions to Chapter 109.1 clarified that yard waste collection for recycling would begin in

March each year and that yard waste could be collected with trash during January and February, other than Christmas tree collection. The reason that yard waste recycling from residential properties is suspended in the months of January and February is because very few leaves and virtually no grass are generated during that part of the year.

Townhouse communities may apply to the county for approval of an alternative yard waste recycling system. The reason for this flexibility is because lawns are typically small and these communities contract with landscaping firms that groom common areas. In 2007 and continuing in 2008, Fairfax County required all townhouse communities to apply for approval of an alternative yard waste recycling system. Approximately 200 townhouse communities have approved alternative recycling systems for yard waste.

Woody materials, referred to as brush, comprise a significant portion of the yard waste collected in the county. Brush is managed at either the I-66 or I-95 facility and is ground into mulch. The mulch from these facilities is available free to county residents who can self-haul the material to the end use location. Typically, mulch is used as a top-dressing around decorative plantings to reduce weed growth and to maintain soil moisture.



Leaves and grass comprise the balance of the yard waste managed in the county. This material is generally collected in bags or by curbside vacuum collection and is sent to either of two composting facilities where the material undergoes biological decomposition to turn it into compost. Typically,

compost is used as a soil amendment or substitute. In 2007, over 168,000 tons of yard waste were recycled in Fairfax County.

Leaves collected in the fall by the county for customers receiving (and paying for) curbside vacuum leaf collection are ground during the vacuuming process. These ground leaves are taken to several Fairfax County parks where the ground leaf mulch is available for use by the Park Authority and by residents who can haul it away themselves for use in their yards.

ii. Recycling Drop-Off Centers

Fairfax County operates eight Recycling Drop-Off Centers at various locations throughout the county. The RDOCs are unmanned facilities, open 24 hours, and there is no fee to use them. No new RDOCs have been added to the county system in approximately 10 years, but the existing facilities are used frequently

by residents and about 6,000 tons of recyclables are collected annually in the drop-off centers. RDOCs continue to play an important role in supporting recycling in the community, serving patrons in multifamily units and small businesses.

iii. County Agency Routes

All county agencies receiving refuse collection and recycling services from the SWMP participate in the county recycling program. In calendar year 2007, county agency locations recycled approximately 776 tons of material. In 2008, the SWMP invested in containers for the collection of bottles and cans (plastic bottles, aluminum beverage cans and glass bottles) from buildings owned and occupied by Fairfax County and its employees. These plastic containers have been placed in all of the county's larger office buildings and most of the smaller agency buildings in areas where beverages are sold and consumed like cafeterias and conference rooms. Existing can and bottle collection containers already placed in county buildings were all relabeled in the hope of refocusing county employee efforts on recycling. Additionally, cardboard containers used to collect paper from county buildings were replaced due to damage or age.

iv. Document Shredding

Fairfax County offers residents the opportunity to shred personal documents at certain locations around the county, usually in conjunction with electronic recycling events or HHW collection events. This service is offered to help residents protect their personal financial information while directing the shredded paper to a recycling facility. In calendar year 2008, nine document shredding events have been planned or have already taken place. As of June 2008, approximately 15 tons of personal documents had been shredded.

v. Public Education and Outreach

Public education and outreach are key components of any successful municipal recycling program. To that end, the SWMP has focused on developing creative education programs that take advantage of its partnerships with county agencies, Fairfax County Public Schools, community organizations (e.g., scouts, youth groups, Jaycees), commercial businesses and privately-owned collection companies. Outreach programs consist of: activities and displays at county festivals; support and publicity for several events specifically dedicated to recycling; public speaking opportunities; and technical support in the research of recycling technologies and issues.

The SWMP continues to partner with the Fairfax County Wastewater Treatment Program in its educational effort entitled "Sewer Science." This program is a hands-on class that Wastewater Management employees have introduced into Fairfax County high schools. The program teaches high school students about municipal wastewater treatment through a week-long laboratory that simulates wastewater treatment processes. Sewer Science, which supports

the Virginia Standards of Learning for biology and chemistry, is taught by the science teachers with assistance and support from county employees.

Both the county's stormwater program and the solid waste management program have been invited to assist in the Sewer Science program to teach high school students about how stormwater is managed and what happens to refuse and recyclables in the county. Staff from all three of these county environmental programs collaborate with high school science teachers to tailor information to meet the educational needs of the students. To date, the SWMP has made about 60 presentations to Fairfax County high school students about how trash and recycling are managed in the county.

The SWMP continues to work closely with the Northern Virginia Regional Commission on a regional public information program entitled "KnowToxics." The purpose of this program is to educate business owners about their responsibility to comply with federal and state regulations that require proper disposal or recycling of spent fluorescent lamps, rechargeable batteries and computers and related electronics. The program is centered on its Web site: www.KnowToxics.com which provides a resource where businesses can learn how to legally and appropriately manage these materials.

The SWMP has also continued a rechargeable battery recycling program, in collaboration with the Rechargeable Battery Recycling Corporation Program. RBRC is an industry-funded program where rechargeable batteries can be collected and sent for recycling at no charge. Collection boxes for rechargeable batteries are now located at offices of all members of the Fairfax County Board of Supervisors and at major county buildings. A complete listing of collection locations is on the county Web site at: <http://www.fairfaxcounty.gov/dpwes/recycling/mat-bat.htm>

The Fairfax County Solid Waste Management Program partnered with the Metropolitan Washington Council of Governments to produce the Builder's Guide to Refuse and Recycling.

Annually, the Solid Waste Management Program participates in Celebrate Fairfax and Fall for Fairfax. At the Celebrate Fairfax event in 2008, the SWMP display received a first place ribbon in design for its "Green Begins in Your Backyard" themed exhibit. The display, visited by county residents and guests, provided brochures, photos and responses to questions about the integrated solid waste management program in Fairfax County.



Both of these events are a major portion of the county's overall public outreach campaign and provide the program with opportunities to disseminate technical guidance and practical information on using the county's solid waste management system.

The SWMP is a proud financial sponsor of the annual Earth Day/Arbor Day celebrations promoted by Clean Fairfax Council. The SWMP also supports the Johnnie Forte Jr. Environmental Scholarship, which awarded twelve \$500 grants to applicants from the Fairfax County Public Schools. Student



groups receiving the grants are invited to make a presentation regarding their use of the grant in front of members of the Board of Supervisors, at the annual Earth Day/Arbor Day celebration at Northern Virginia Community College. The annual Fairfax County Business Recycling Awards are also presented at this same event, recognizing businesses that excel in their recycling efforts.

This scholarship program is a portion of the Schools/County Recycling Action Partnership. The SCRAP partnership was created by the Fairfax County Public Schools and the SWMP to provide opportunities for the students of Fairfax County Public Schools to learn about recycling and other environmental issues and to enhance recycling throughout the system. The SWMP developed the scrapbook, a resource tool distributed to all science teachers in the FCPS system, that details all of the opportunities provided by the SWMP and the Clean Fairfax Council to aid in the instruction of students, including training and presentations, tours and how to apply for the Johnnie Forte grant award.

The SWMP also supports the county's Employee Recycling Committee. The ERC meets monthly and works on projects designed to encourage county



employee participation in recycling. The group coordinated the county employee's Earth Day Expo celebration and the Employee Recycling Committee Recycler of the Year Award.

The county Earth Day Expo is held annually at the Government Center, in conjunction with another

event for all administrative assistants in the county. Many county agencies with responsibility for environmental protection and stewardship in the county participate, with informational booths staged in the Government Center during the lunch hour. These booths provide an opportunity for attending employees to better understand the services provided by these agencies.

America Recycles Day 2007 was celebrated on November 10, 2007, with the Community Recycling Roadshow at Herndon High School. At the end of the day, the SWMP collected 502 pairs of eyeglasses for the Lion's Club of Fairfax and 547 cellular telephones for OAR of Fairfax County. Safeguard Shredding



reported five tons of paper shredded and took an additional five totes collected for shredding back to its facility. Bikes for the World received over 150 bicycles.

ServiceSource and CDM E-Cycling received over 40 tons of computer and peripheral equipment (including televisions, CD and DVD players and telephones). Art for Humanity collected 20 boxes of shoes, 33 boxes of bed sheets, pillowcases and towels, 50 microwaves and 30 sewing machines. Diana's Books collected over one ton of books, CDs, DVDs and VHS tapes. RBRC received more than 350 pounds of rechargeable batteries.

Another aspect of the SWMP's public outreach and education effort is active involvement in community events and public speaking opportunities and support to various community special interest groups such as the Lorton Citizens Alliance Team and the annual Residents Solid Waste Forum. The Residents Solid Waste Forum meeting invitation list was broadened this year and this strategic change resulted in additional participation and a very successful meeting in April 2008.

The SWMP also uses the Internet by posting pertinent information about timely subjects on the program's Web site. Information about the program's involvement in community events, as well as new information about solid waste matters, can be found at: www.fairfaxcounty.gov/living/recycling.

Staff continues to update the SWMP Web site to improve its ease of use for residents and businesses. More information was added to help county residents, solid waste industry companies and schools access forms, data and publications about the program.

The SWMP also published an electronic "listserv" to county collection customers to automatically send updates to customers on the program and to

provide updates regarding service changes due to inclement weather. A similar “listserv” tool was developed to give vacuum leaf collection customers the most up-to-date information on the exact dates that the leaf collections would be conducted on their streets in order to ensure that residents would have time to rake their leaves to the curb.

The SWMP published for distribution to county residents (and others, upon request) a brochure that consolidates and summarizes information about the program. Printed on recycled paper, the color brochure briefly provides an overview of the program.

vi. Awards and Recognition

The Solid Waste Association of North America recognizes outstanding solid waste programs and facilities through its Excellence Awards Program. These annual awards are presented to governmental organizations that advance the practice of environmentally and economically sound solid waste management through their commitment to: 1) utilizing effective technologies and processes in system design and operations; 2) advancing worker and community health and safety; and 3) implementing successful public education and outreach programs. Programs also must demonstrate that they are fiscally and environmentally responsible through their compliance with all applicable federal, state and local regulations. In 2007, Fairfax County’s Solid Waste Management Program was awarded the annual Excellence Award in the category of “Integrated Solid Waste Management” at the bronze level by SWANA.

3. Clean Fairfax Council

Clean Fairfax Council is a private, nonprofit (501(c)(3)) corporation dedicated to the education of the residents of Fairfax County on issues relating to litter prevention and recycling. Environmental education is provided to students and adults throughout the county. The council has many approaches to public education, including brochures, a newsletter, educational videos, interactive programs for students, community service opportunities for students (i.e., support at the council’s office), classroom presentations and presentations to homeowner associations and other groups. All of the council’s informational brochures are translated into the six major foreign languages used in Fairfax County: Korean; Spanish; Urdu; Farsi; Vietnamese; and Chinese.

A key effort of the council is the sponsorship of spring and fall cleanups. These cleanups are accomplished by the council sending information regarding the cleanups to all homeowner associations, public schools and assorted churches and businesses. The council asks volunteers to plan their cleanup by selecting a site, gathering volunteers and setting a date and time. Then, if they fill out a sign-up form and send it to the council, they are provided trash bags, recycling bags, vests and safety tips along with an automobile litter bag and a memento for each participant. In its 2006/2007 annual report, the council notes that there were 9,582 participants at 110 cleanup events; the volunteers worked over 41,565 hours, which would be an equivalent of

nearly \$750,000 of effort at the state average hourly value of volunteer time as provided by the Virginia Center for Charitable Statistics.

The council also sponsors an "Adopt-A-Spot" program whereby residents can adopt a spot for two years and pledge to clean it up four times a year. Additionally, the council produces the annual Fairfax County Earth Day/Arbor Day Celebration held in late April.

There are many other programs offered by the Clean Fairfax Council, including programs that are beyond litter prevention/control aspects. For more information, please visit the Web site at www.cleanfairfaxcouncil.org.

C. RECOMMENDATIONS

No new recommendations are proposed this year.

REFERENCES

Much of the narrative and illustrations were supplied by the following agencies of the Department of Public Works and Environmental Services:

- Division of Solid Waste Collection and Recycling.
- Division of Solid Waste Disposal and Resource Recovery.

The information about the Clean Fairfax Council was provided by Rosemary Byrne, Executive Director, Clean Fairfax Council

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VI

HAZARDOUS MATERIALS

V. HAZARDOUS MATERIALS

A. ISSUES AND OVERVIEW

1. Overview

Fairfax County hazardous materials concerns may be considered less significant as compared to other jurisdictions; the industrial base within the county is relatively “clean.” Nevertheless, the county does have its share of problems. The main concerns are hazardous materials incidents involving spills, leaks, transportation accidents, ruptures or other types of emergency discharges. Secondary is the use and disposal of hazardous materials in either daily household activities or by small quantity commercial generators. The final concern is the clean up and regulation of hazardous materials.

Although the news media are constantly reporting industrial and transportation related hazardous materials incidents, there is a general lack of awareness by the public of health and safety risks associated with the use, storage and disposal of common household hazardous materials. Educating the public on the implications of these hazardous materials on peoples’ lives remains a significant goal.

Possible upcoming hazardous material concerns are the potential flood of discarded television sets in the next year due to the February 2009 switch to digital television broadcasting and the switch to compact fluorescent light bulbs. Older models of televisions with cathode ray tubes contain several pounds or more of lead. CFLs contain small amounts of mercury which must be disposed of properly when the bulb is used and when it is broken. Education campaigns have focus on the cost savings of CFLs, but there are some potential concerns that are mentioned in this chapter.

2. Hazardous Materials Incidents

a. Overview of 2007 Hazardous Materials Incidents

In 2007, the Fire and Rescue Department’s Hazardous Materials and Investigative Services section received 315 complaints involving hazardous material (80 fewer than the previous year), 290 of which were reported spills, leaks or releases of hazardous materials into the environment. Of the 290 releases, 217 involved petroleum bases products. There were 54 hydraulic oil spills/releases (mostly from trash trucks), 40 fuel oil or home heating oil releases, 44 gasoline releases and 35 diesel fuel releases. The remainder consisted of a variety of materials including paint, antifreeze, cleaners, various gases, various chemicals and mercury. There were 60 incidences where the release of hazardous materials did impact storm drains

or surface waters. Currently, 32 sites are being tracked for long term remediation. The most significant of these is the Pickett Road Terminal Site (Fairfax Tank Farm) release which started in 1991. Also being assessed is the underground methane production situation in a residential neighborhood. This problem originated in early 2005. The Hazardous Materials and Fire Investigation Mobil Lab was requested to address 16 incidents or events. Personnel in this section maintain relationships with the major pipeline companies and blasting companies that operate in the county. (1)

b. Hazmat Response Team Information

The Fire and Rescue Department maintains a well equipped hazardous materials response team for emergency response. The primary unit operates out of Fairfax Center Fire Station 40. There are four satellite stations located throughout the county in support. These stations are located at Fire Station 1 in McLean, Fire Station 11 Penn Daw, Fire Station 19 in Lorton and Fire Station 26 in Springfield. These units are strategically positioned to provide rapid response and adequate coverage throughout Fairfax County. Response personnel are trained and equipped to initiate product control and mitigation measures to prevent or minimize the adverse environmental impact and damage. All units are staffed 24 hours per day, seven days per week. (1)

The Hazardous Materials Response Team responded to 416 calls in CY 2007. The team responded to a myriad of incidents including methane/propane gas emergencies, transformer fires, overturned gasoline/ethanol tank trucks, weapons of mass destructions investigation for suspicious packages or white powder, mercury events, chemical odors or spills, petroleum releases, the dumping of hazardous materials and various other Department of Transportation HazMat Class events. (1)

In addition to the efforts of the Operations Division and Hazardous Materials Investigative Services Section personnel, the Fire and Rescue Department maintains a contract with a major commercial hazardous materials response company to provide additional support for large-scale incidents. The Fire and Rescue Department has stressed its commitment to protecting the environment and residents through proper enforcement of the Fairfax County Fire Prevention Code and through rapid identification, containment and cleanup of hazardous materials incidents. (1)

3. Hazardous Materials in the Waste Stream

The disposal of household and small quantities of non-household hazardous materials into the waste stream continues to be a concern. Unlike hazardous materials incidents, the immediate impact is not as dangerous. However, the long-term impact can be just as severe. Hazardous materials in the waste stream

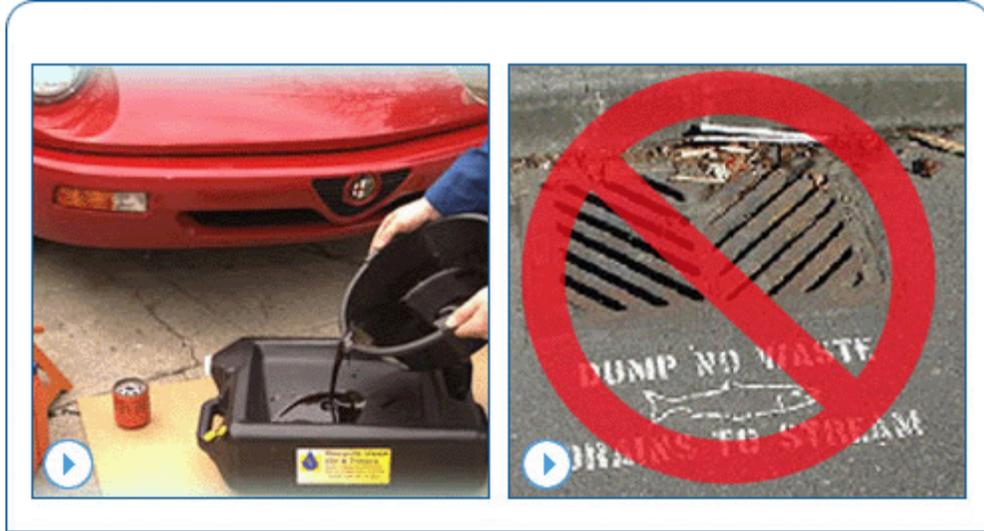
are contaminating landfills. Sometimes hazardous materials are dumped illegally, which leads to stream and groundwater pollution and soil contamination. Household hazardous wastes are products used in and around the home that are flammable, corrosive, reactive or toxic. These hazardous materials potentially can cause a safety problem if various household chemicals become mixed when disposed of with the regular trash. By disposing of household hazardous wastes separately in the appropriate manner, these materials can be properly handled and packaged to minimize exposure to potentially harmful chemicals and decrease the likelihood that these chemicals will enter the environment.

a. Used Automotive Oil and Fluids

Millions of do-it-yourselfer motorists change their own oil. Some of the oil is disposed of properly at a used-oil recycling center. But much used motor oil is being disposed of in garbage cans, sewers, storm drains and backyards – practices that can contaminate soil, local streams, rivers, bays and beaches. One gallon of used motor oil, if not disposed of properly, can contaminate one million gallons of water. (4)

As a part of its ongoing effort to educate all Americans on environmental responsibility, the EPA launched the **“You Dump it, You Drink It”** campaign, aimed at the Hispanic automotive repair and service industry and consumers. Despite the fact that about half of all automotive mechanics in the United States are Hispanic, little if any Spanish-language materials exists for the automotive repair industry and those consumers who change their own motor oil. EPA hopes to fill this void through a wide-scale distribution of these materials, which include posters, brochures and bumper stickers. These materials are available to download from the EPA Web site. (5)

Recycling of petroleum products is less well known than for other products. The recycled used motor oil is used for many purposes. The primary use is to refine it into a base stock for lubrication oil. The secondary use of used oil is to burn it for energy. If you recycle just two gallons of used oil, it can generate enough electricity to run an average household for almost 24 hours. (4)



Many service stations, repair facilities and quick lubes will accept used oil and used oil filters.

(The American Petroleum Institute-The Oil Recycling Process Web site: www.recycleoil.org [4])

b. Dumping into Storm Drains

Storm drains carry stormwater runoff from streets (see the Water Resources chapter of this report). This water is not treated and goes directly into local streams. All streams in Fairfax County eventually flow into the Potomac River, which empties into the Chesapeake Bay. Anything dumped down a storm drain will follow the same path as the stormwater runoff. (6)

The cleaning up of animal wastes and the disposal of such wastes down storm drains, as well as the disposal of leaves down the storm drains, are attempts at doing a service that have the effect of introducing pollutants directly into county streams. There are deliberate disposals of chemicals, oils and other items into the storm drains as “out-of-site, out-of-mind.” In either situation, there is a misperception that the storm drains are part of the county sewage system and that the disposal of materials down these drains does not provide a direct impact to the environment.

4. Pipelines

The following was reported by the Fairfax Joint Local Emergency Planning Committee:

“More than 3,000 companies operate some 1.9 million miles of natural gas and hazardous liquid pipelines in the United States. The pipeline network includes 302,000 miles of natural gas transmission pipelines operated by 1,220 firms, and 155,000 miles are hazardous liquid transmission pipelines

operated by 220 outfits. In addition to transmission pipelines, 94 liquefied natural gas facilities operate in the United States.”

Pipelines traverse Fairfax County, carrying refined petroleum for two companies and natural gas for three companies. The Office of Pipeline Safety in the U.S. Department of Transportation regulates pipeline design and the construction, operation and maintenance of pipelines to ensure safe transportation of hazardous liquids and natural gas. (7)

5. Rail Transport of Hazardous Materials

Chemicals and materials that are hazardous have regularly been transported by rail. While having chemicals and hazardous materials transported by rail keeps them off the highways, accidents or leaks have been, and continue to be, a cause for concern. Additional concerns have been introduced as a result of the September 11, 2001 terror attacks, new ethanol transfer stations and the future shipments of nuclear radioactive waste throughout the country.

The July 18, 2001 CSX Train fire in a Baltimore, Maryland tunnel was an unintended incident involving a train car with hazardous materials and had wide-range, long-term consequences. Major sections of the downtown were closed, businesses were impacted, Orioles’ games had to be rescheduled, and portions of a major street were closed for five weeks. (3)

The July 2001 Baltimore tunnel fire immediately got woven into debate of whether nuclear waste could be transported safely to Nevada. Studies in 2003 were performed to determine what would have happened had the train been carrying nuclear waste. Conclusions differed. A state analysis concluded that a cask carrying radioactive spent fuel would have been breached by temperatures inside the Howard Street Tunnel. Escaping radioactive particles would have contaminated 32 squares miles, increased the chances of cancer deaths for up to 28,000 people and cost \$13.7 billion to clean up. The Nuclear Regulatory Commission said the nuclear waste canister would have endured the fire “and the health and safety of the public would have been maintained.” (3)

Rail through Fairfax County is in the eastern and southern portions of the county and does not include tunnels. Residents are generally not located as close to the rails in Fairfax County as in other jurisdictions. However, some hazardous materials, alone or in combination, when released can affect areas up to miles from the initial site of the incident. It is conceivable that Fairfax County residents could be impacted with hazardous materials from a rail incident in another jurisdiction.

B. PROGRAMS, PROJECTS AND ANALYSES

1. Fairfax Joint Local Emergency Planning Committee

Local Emergency Planning Committees are required by Section 301[c] of Title III of the Emergency Planning and Community Right-to-Know Act, a freestanding provision of the Superfund Amendments and Reauthorization Act of 1986. The main thrust of SARA is to identify and clean up waste sites that are potentially toxic. Title III has two important provisions: 1) it provides for emergency response planning to cope with the accidental release of toxic chemicals into the air, land and water; and 2) the community right-to-know provisions of Title III help to increase the public's knowledge and access to information on the presence of hazardous chemicals in their communities and releases of these chemicals into the environment. Under Title III, states are required to organize into planning areas and to establish local Emergency Planning Committees.

The FJLEPC is comprised of representatives of the city of Fairfax, the county of Fairfax, the town of Herndon and the town of Vienna. Committee members include local government officials, police, fire and rescue officials, environmental and governmental planners, public health professionals, hospital officials, public utility and transportation officials, representatives of business organizations, professional societies, civic organizations and the media. These representatives meet six times per year. The FJLEPC: (1) collects information about hazardous materials; (2) develops and updates, on an annual basis, the Hazardous Materials Emergency Response Plan; and (3) provides information to the public about the use, storage and manufacture of hazardous materials. The Plan also contains notification procedures in the event of an incident, on site means of detecting incidents, evacuation routes, clean-up resources and identification of parties responsible for the site. The Annual Plan is exercised regularly.

FJLEPC provides education and outreach to the public. Information is disseminated through public meetings, brochures, newsletters and a Web site: www.lepcfairfax.org. The newsletter, which is mailed to civic and homeowner associations, focuses on emergency preparedness, disaster planning and fireworks safety. FJLEPC produced a video about shelter in place. The video is available through any of the Fairfax County public libraries as well as online through the county's "video on demand" service at www.fairfaxcounty.gov/cable/channel16/vod.htm. (8) LEPC members are available to speak to businesses or residents' groups, as requested.

2. Railroad Transportation Plan

The CSX Transportation, Hazardous Material Systems, has a hazardous material emergency response plan. A written copy of that plan is on file with FJLEPC and the Fairfax County Fire & Rescue Hazmat Station 34. The Web site for CSX is: www.csx.com.

On the Web site, CSX reports that each year it moves over 300,000 shipments of hazardous material and has a low number of incidents. "For every billion ton-miles of hazardous materials transported, trucks (which operate over inherently more dangerous highways) are involved in 10 times as many accidents as the rails. CSXT has achieved a 99.9 percent success rate for safe transportation of hazardous materials." CSX has been involved with years of hearings and legal proceedings concerning the safety with urban rail transportation of certain hazardous materials. Among these is the re-routing trains around Washington D.C. (9).

3. Storm Drain Education Program

The Northern Virginia Soil and Water Conservation District has coordinated storm drain education in Fairfax County for over a decade. In 2007, Fairfax County, as part of its watershed plan implementation, continued to support the program by purchasing the plastic markers and glue and reproducing the program's flyers. With that assistance, the District continued to expand this water quality improvement program. This program has proven to be an effective, low-cost method of educating large segments of the population about water quality problems in our streams, lakes, rivers and the Chesapeake Bay. Volunteers can choose preprinted markers and adhesive or stencils and paint to mark storm drains. (6)

The goal of the expanded program continues to be educating the community about the water quality impacts of storm drain dumping. Pollution that enters our water resources through storm drains is called nonpoint source pollution because it comes from all our homes and communities. Nonpoint source pollution is the leading cause of water quality deterioration in the Chesapeake Bay. During 2007, 909 volunteers worked in their communities to carry out 48 NVSWCD projects. These volunteers included scout groups, middle and high school students and homeowner associations. As a result, more than 21,297 households in Fairfax County received nonpoint source pollution prevention education. This included information about how to properly dispose of used motor oil and other hazardous materials. The volunteers labeled 5,210 storm drains which provide an on-going reminder to not dump anything in storm drains. Check NVSWCD's Web site, to learn more about the Storm Stenciling Program and how civic and community groups can have their local drains marked (<http://www.fairfaxcounty.gov/nvswcd/stormdrained.htm>). (6)

NVSWCD also publishes a bi-monthly newsletter, *Conservation Currents*, for Fairfax County residents. The June 2005 issue focused on hazardous waste reduction and included an article entitled “Healthy Homes, Healthy Communities: Household Hazardous Waste Reduction in Fairfax County.” The article included information on how to determine which home products are hazardous waste and provided information on safe disposal. (6)



Pictures of storm drain marking by local volunteers (provided by NVSWCD (6))

A relatively new group of local governments and utilities called the Northern Virginia Clean Water Partners has launched an effort to educate the public about how to prevent water pollution. The group includes the counties of Fairfax, Arlington, Loudoun, Prince William and Stafford; the cities of Alexandria, Fairfax and Falls Church; and the towns of Dumfries, Herndon, Leesburg and Vienna. Other members of the partnership are Fairfax Water, Loudoun Water, the Northern Virginia Regional Commission and the Virginia Department of Environmental Quality Coastal Zone Management Program. (2)



The logo, and theme, for the Northern Virginia Clean Water Partners (2)

Each spring, NVCWP launches a campaign to remind residents that they can reduce the amount of polluted storm water reaching waterways. The group plans surveys to help quantify the effectiveness of the campaign. It also wants to figure out how aware Virginians are of stormwater pollution and the behaviors that cause it. Last year’s survey found that after hearing the radio spot, 12 percent of respondents would be more careful with fertilizer, nine percent would pick up after their pet more often and nine percent said they would recycle their motor oil. (2)

To learn more about NVCWP, check its Web site at: www.onlyrain.org.

4. Household Hazardous Waste Program

As a part of the suite of recycling and disposal services offered to Fairfax County residents, the county's Solid Waste Management Program operates two permanent Household Hazardous Waste collection facilities, one at the I-66 Transfer Station and the other at the I-95 Complex. Information on the locations, hours of operations and types of wastes accepted and how to dispose of the wastes can be found on the county's Web site at www.fairfaxcounty.gov/dpwes/trash/disphhw.htm or by calling a recorded 24 hour information line at 703-324-5068.

I-66 TRANSFER STATION

Thursday: 1:00 p.m. – 5:00 p.m.
 Friday: 8:00 a.m. – Noon
 Saturday: 8:00 a.m. – 4:00 p.m.
 Sunday: 9:00 a.m. – 4:00 p.m.

I-95 LANDFILL

Thursday: 8:00 a.m. – Noon
 Friday: 1:00 p.m. – 5:00 p.m.
 Saturday: 8:00 a.m. – 4:00 p.m.

The HHW program provides an overall community benefit, and therefore residents are not charged when they use the program. The program receives its funding through the Solid Waste Management Program tip fees and from the General Fund. Beginning in FY 2009, the General Fund support will be removed and the program will be paid entirely from tip fees. In FY 2008, materials deposited by residents for disposal or recycling primarily consisted of antifreeze, motor oil, lead acid batteries and latex paint. It is germane to note that none of these materials is regulated as hazardous waste.

In FY 2008, 21,958 users participated in the HHW program, disposing of 428,064 pounds of HHW. This represents only an 0.7 percent increase in the number of users compared to FY 2007 but a 5.4 percent increase in the weight of HHW disposed over FY 2007 data. Program details are provided in Table VI-1 below (11).

It is anticipated that the amount of HHW entering the county program will continue to increase; however, capacity is available at the existing facilities to meet county needs well into the future.

TABLE VI-1
Fairfax County Household Hazardous Waste Program:
Record of Fiscal Year Disposal

Fiscal Year	Participation (# of users)	HHW (pounds)	Cost per household
FY 2008	22,112 households	452,552	\$30.59
FY 2007	21,958 households	428,064	\$27.77
FY 2006	21,471 households	440,076	\$26.32
FY 2005	22,866 households	411,315	\$18.84
FY 2004	18,600 households	373,220	\$22.92
FY 2003	16,140 households	359,840	\$23.30
FY 2002	16,272 households	368,060	\$20.97
FY 2001	15,312 households	356,275	\$18.75
FY 2000	15,564 households	330,325	\$18.33

Source: Fairfax County Department of Public Works and Environmental Services, Division of Solid Waste Disposal and Resource Recovery, excludes remote HHW events.

5. Commercial Hazardous Wastes

In FY 2008, the SWMP conducted three Conditionally Exempt Small Quantity Generator waste collection events at the I-66 Transfer Station Complex. A CESQG is, according to federal hazardous waste regulations, any business that generates less than 220 pounds or 27 gallons of hazardous material per month. CESQGs pay a disposal fee for the hazardous material they bring to these events. This fee is generally lower than what it would cost to have an appropriate contractor pickup the waste at an individual business location. This allows the CESQGs to be able to afford to participate in an environmentally responsible program. Commercial hazardous waste generators that do not qualify as CESQGs must rely on commercial hazardous waste disposal companies for their disposal needs. In FY 2008, 71 companies participated in the three events. Information about the CESQG program and a list of commercial hazardous waste disposal companies are available on the county's Web site at www.fairfaxcounty.gov/dpwes/trash/disphazcomm.htm.

The SWMP also spearheaded development of the Know Toxics program, managed regionally by the Northern Virginia Regional Commission staff and Waste Management Board, www.KnowToxics.com (11).

6. Rechargeable Battery Recycling

In addition to the SWMP's battery collection activities described in the Solid Waste chapter of this report, the SWMP also collects mercury and lithium batteries for recycling at its HHW facilities. Non-rechargeable household batteries are not accepted by the program and can be safely thrown away.

NiCad and other rechargeable batteries (commonly found in cordless tools and appliances, computers, camcorders, cameras and toys) are also accepted by the HHW program. The program has put rechargeable battery containers at the Fairfax County Government Center and each of the Board of Supervisor's offices, and program staff collects these batteries on a routine basis. A complete listing of collection locations is on the county Web site at: <http://www.fairfaxcounty.gov/dpwes/recycling/mat-bat.htm>.

As described in the Solid Waste section of this report, the SWMP also participates and actively supports the recycling service provided by the Rechargeable Battery Recycling Corporation (11).

7. Remote Household Hazardous Waste Events

As an adjunct to the permanent HHW facilities, and as described in the Solid Waste chapter of this report, the SWMP has received special funding through the county's Environmental Improvement Program to conduct a series of remote HHW collection events at locations throughout the county. In FY 2008, five of these events were conducted in Mount Vernon, Mason, Dranesville, Hunter Mill and Springfield Districts. These events require the use of an outside contractor to augment county staff as the events are held on Saturdays, which is the same time that county permanent sites receive maximum use. The cost of the remote events is approximately \$22,185 per event. They are provided at no cost to county residents and, therefore, dependent upon the special funding from the Board of Supervisors. Over 1,898 households participated in the five events. These events removed over 117,827 pounds of materials from the waste stream and disposed of 980 CFLs. In addition, 547 tons of electronics/computers were collected in the county in CY 2007. (11)

8. Fluorescent Lights

Compact fluorescent lights have become popular for residential use due their energy savings potential. However, these lights contain minute quantities of mercury which classify them as HHW when they are disposed. These types of lights are accepted for proper management from residents at both of the county's HHW facilities and at the remote HHW events.

Small businesses that generate less than the regulated quantity of fluorescent lights may bring them to the business hazardous waste collection events. Other larger businesses that generate regulated quantities of these materials must comply with federal and state regulations regarding their proper disposal or recycling of the lights (11). A new brochure about the value of using fluorescent lights and how to recycle them is available on the county Web site.

While CFLs require more energy in manufacturing than incandescent lights, this is said to be offset by the fact that they last longer and use less energy during

their life spans. But while CFLs are reported to have significant energy savings, some reports indicate this high energy savings will be reduced considerably if these lights are used in places where the light is turned on and off frequently. Using regular CFLs with a dimmer or with an electronic/digital timer can shorten the bulbs' life. There are other reasons regular CFLs can fail prematurely. With incandescent bulbs beginning to be phased out in 2012, concerns about CFLs include the initial cost to change over to CFLs, shorten bulb-life if not used correctly, and with shortened life of bulbs, an increased need to recycle these bulbs over what is projected. (10)

C. REPORTING ENVIRONMENTAL CONCERNS AND ISSUES

Environmental issues affect everyone living and working in the county. All environmental concerns and events negatively impacting the county should be reported. A list of contact information relating to environmental crimes is provided in Table VI-2 below.

D. LEGISLATIVE UPDATE

On December 19, 2007, the Energy Independence and Security Act of 2007 was signed. Among other things, this will begin the phase out of the incandescent light bulb from the U.S. market in 2012. (10)

E. COMMENTS

EQAC adds one new comment and reiterates its comments from the 2007 Annual Report on the Environment:

1. The transition to compact fluorescent lights beginning in 2012 will have a major impact on consumers and landfills. With the varied information about how long the CFLs last with different uses and how that may impact consumers and landfills, EQAC suggests that the county prepare correct information on the different types of CFLs needed for different uses like timers, dimmers and lights that are frequently turned on and off. After the 2009 digital television transition, the county should begin educating citizens, businesses and builders.

Table VI-2	
HOW TO REPORT ENVIRONMENTAL CRIMES	
<u>Type of Incident</u>	<u>Phone Number</u>
<p><u>ANY ACTIVE RELEASE OF MATERIALS INTO THE ENVIRONMENT</u></p> <p>If the dumping of any substance into a stream, into a manhole, into a storm sewer or onto the ground is witnessed, assumptions regarding the contents of the materials should not be made. 911 should be called immediately. When calling 911, be prepared to provide specific information regarding the location and nature of the incident. The local office of the U.S. Environmental Protection Agency (703-235-1113) can be called in addition to (but not instead of) 911.</p>	911
<p><u>HAZARDOUS MATERIALS-DANGEROUS</u></p> <p>If a suspected hazardous substance is being released, if lives are in danger or if property is threatened, 911 should be called immediately. It is also appropriate to call 911 anytime an active release is witnessed.</p>	911
<p><u>HAZARDOUS MATERIALS-NO IMMEDIATE DANGER</u></p> <p>If a known discharge of hazardous materials has occurred in the past and no lives or property are in immediate danger; this must be reported to the Fairfax County Fire and Rescue Department's Hazardous Materials and Investigative Services Section at this number (includes Towns of Clifton, Herndon and Vienna). If there is any question about whether a release may still be active or whether there may be any immediate danger, 911 should be called.</p>	<p>During working hours, call: 703-246-4386</p> <p>After hours, call: 703-691-2131</p>

Table VI-2 (continued)	
HOW TO REPORT ENVIRONMENTAL CRIMES	
Type of Incident	Phone Number
<p><u>RELEASE OF ANY MATERIAL INTO THE ENVIRONMENT</u></p> <p>Any release of materials into the environment, whether hazardous or not, should be reported to the Northern Regional Office of the Virginia Department of Environmental Quality at the above number. If the release is an active one, call 911.</p>	<p>703-583-3800</p>
<p><u>EROSION AND SEDIMENTATION</u></p> <p>If the illegal removal of trees, the illegal clearing of land and/or the illegal dumping of fill is suspected, contact Fairfax County's Code Enforcement Division at this number. This number should also be contacted if siltation and other harmful effects of construction activity are occurring or observed on neighboring lands and waterways. All calls received during non-working hours will be responded to during the next business day.</p>	<p>703-324-1937</p>
<p><u>HEALTH HAZARDS</u></p> <p>In addition to the above contacts, if a health hazard is suspected, contact the Environmental Health Administration at this number. The Health Department's Community Health and Safety Section (703-246-2300) can also be called. Asbestos-specific releases should also be reported to the Health Department.</p>	<p>703-246-2205</p>

2. EQAC continues to support an aggressive public education campaign on how to properly dispose of household/residential, commercial and industrial hazardous waste. EQAC further suggests continuous partnering with the Northern Virginia Board of Realtors and solid waste haulers to distribute information to all new residents in the county. New residents would be anybody buying or renting a house, townhouse or condominium. Waste removal companies could be asked to include an information letter with their mailings to their customers. Creative use of other organizations is also encouraged.
3. EQAC recognizes the county's ability to collect rechargeable batteries at the I-66 transfer station, the I-95 solid waste site and special programs with the business

community. Schools and other organizations should be encouraged to come up with creative initiatives to promote significant increases in recycling rechargeable batteries. Possible sites to house recycling drop off bins should be explored, such as outlying areas of parking lots. With the growing popularity and use of rechargeable battery products, especially cellular phones, EQAC recommends an aggressive program to promote recycling of NiCad rechargeable batteries.

4. EQAC supports continuation of advertisement and education of the public regarding the types of hazardous materials and other environmental situations residents are requested to report, including whom they are to contact. Possible avenues are community association newsletters, press release stories to the media and age appropriate material sent home through the schools. Avenues that are not connected with environmental information should be explored to reach people not drawn to environmental events.

F. RECOMMENDATIONS

No new recommendations are proposed this year.

REFERENCES

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2. *Washington Post Newspaper*, "Fairfax Section", 1 May 2008, p 1 & 36; and Northern Virginia Clean Water Partners Web site: www.onlyrain.org.
3. "Waste shipping debate examines Baltimore tunnel fire", *Review Journal*, 9 May 2003, www.reviewjournal.com, viewed 27 June 2008
4. American Petroleum Institute, *Used Motor Oil Collecting and Recycling*, www.recycleoil.org, viewed 26 August, 2008
5. U.S. Environmental Protection Agency, Wastes-Used Oil Management Program, www.epa.gov/epaoswer/hazwaste/usedoil/, viewed 26 August 2008
6. Northern Virginia Soil & Water Conservation District, July email with updated information and Web site, <http://www.fairfaxcounty.gov/nvswcd/stormdrained.htm>
7. Fairfax Joint Local Emergency Planning Committee, www.lepcfairfax.org
8. Fairfax County News Release, 24 June 2005, <http://fairfaxcounty.gov/news/2005/05167.htm>
9. CSX, www.csx.com, viewed 29 August 2008

10. “Compact Fluorescent Lamp”, viewed 23 April 2008,
http://en.wikipedia.org/wiki/Compact_fluorescent_lamp
11. Division of Solid Waste Disposal & Resource Recovery and Division of Solid Waste Collection and Recycling FY 2008 Reports
12. Previous EQAC authors of this chapter and material

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VII

**ECOLOGICAL
RESOURCES**

VII. ECOLOGICAL RESOURCES

This chapter summarizes the status of ecological resources and the actions of public agencies and citizen groups in the management and preservation of these resources.

A. ISSUES AND OVERVIEW

Open space and natural habitat continue to be reduced in Fairfax County, primarily because of development (both residential housing and commercial buildings) and road building. As this resource is reduced, increased emphasis must be placed on protecting, preserving and enhancing the remaining open space and natural habitat in Fairfax County.

Fairfax County contains a total of about 227,750 acres. Of this total, about 28,108 acres (12.3 percent) are in parks and recreation as of January 2004. Another approximately 25,712 acres (11.3 percent) are vacant or in natural uses. This compares to the about 26,700 acres (11.7 percent) that were vacant or in natural uses as of January 2003. However, not all this acreage can be considered as open space that is valuable for natural habitat. First, the park acreage consists of active recreation (ball fields, etc.) as well as passive recreation (stream valley parks, nature centers, etc.) Ball fields, while greatly needed in Fairfax County, do not do much for protecting natural habitat. In a like fashion, much private open space consists of mowed areas and isolated trees (not woodlands). Again, this does little for protecting natural habitat. Both active recreation areas and private open space, however, if properly designed can help the environment by reducing storm water runoff (by allowing storm water to infiltrate into the soil).

Second, while vacant land is often wooded, this land is subject to development. Considering the continuing rapid pace of development in Fairfax County, much of this land will soon become residential space, office space, retail space, etc., and not provide much in the way of protecting natural habitat. In 1980, vacant land accounted for 32.2 percent of the total land in Fairfax County. By 1990, this had dropped to 19.5 percent and the figure was 11.3 percent as of January 2004.

Therefore, Fairfax County needs to undertake stronger efforts in order to protect, preserve, and enhance the environmentally sensitive open space in the county. These efforts should include the establishment of a countywide Natural Resource Inventory, followed by a countywide Natural Resource Management Plan. Additionally, the county needs an aggressive program seeking easements on privately owned environmentally sensitive land and, as opportunities arise, to purchase environmentally sensitive land.

Recently, two significant efforts have occurred that should help in the County's preservation and protection of natural resources. First, as reported in the 2004

Annual Report on the Environment, the Fairfax County Board of Supervisors adopted an environmental vision for Fairfax County – *Environmental Excellence for Fairfax County: a 20-Year Vision*. This vision cuts across all activities in Fairfax County and outlines guidelines that hopefully will be followed in future planning and zoning activities in Fairfax County.

Second, as also reported in the 2004 Annual Report on the Environment, the Park Authority approved the Natural Resource Management Plan for park properties. Again, if this plan is implemented, improved preservation and protection of environmentally sensitive land should be the result.

EQAC continues to commend a number of organizations for their activities in protection, preservation, and enhancement of environmentally sensitive areas. These organizations include: the Northern Virginia Soil and Water Conservation District, the Virginia Department of Forestry, the Northern Virginia Conservation Trust, Fairfax ReLeaf, the Fairfax County Department of Public Works and Environmental Services, and the Fairfax County Park Authority and its staff. EQAC especially commends the Fairfax County Board of Supervisors for its vision and activities in environmental areas.

B. PROGRAMS, PROJECTS, AND ANALYSES

1. The Fairfax County Board of Supervisors

In past years, this chapter of the Annual Report mentioned various organizations and programs supporting environmental efforts in Fairfax County. However, the Fairfax County Board of Supervisors, while mentioned many times, did not have a section in this chapter. This changed in the 2005 Annual Report when a section was included on the board. The actions and decisions of the BOS do affect the county's natural resources. These actions and decisions include land use planning and zoning, transportation planning, allocation of staff resources, etc. The BOS has enacted a number of policies that do benefit the environment and many of these policies are embedded in county ordinances and the Policy Plan. However, there never has been an overarching vision dealing with the environment. This has now changed. As reported in the 2005 Annual Report on the Environment, the BOS has now adopted such an overarching vision -- *Environmental Excellence for Fairfax County: a 20-Year Vision*.

This vision is organized into six sections that cut across all areas in the county:

- Growth and Land Use
- Air Quality and Transportation
- Water Quality
- Solid Waste

- Parks, Trails, and Open Space
- Environmental Stewardship

Some recommendations in this document that impact ecological resources include:

- Create more community parks for active and passive recreation – open spaces with native vegetation to sustain local wildlife and to create areas for walking, meditating or bird watching.
- Continue to acquire open space before it is too late through direct purchase or conservation easements to create more trails, connect trails and provide passive and active recreation areas.
- Provide adequate resources to maintain and appropriately develop our parks for passive and active recreation.
- Encourage conservation easements for open space and trails either to private organizations, such as the Northern Virginia Conservation Trust and The Potomac Conservancy, or to government agencies like the Fairfax County Park Authority or the Northern Virginia Regional Park Authority.
- Encourage organizations, for example, those that work on stream monitoring and stream valley restoration, to involve schools and residents of all ages in their work.
- Encourage community-based watershed stewardship groups and help them to work with all stakeholders to protect, enhance and improve the natural resources, and hence, the quality of life in their watersheds.
- Establish an aggressive program of community groups to adopt natural areas such as parks, trails, and stream valleys.

The document can be viewed at: http://www.fairfaxcounty.gov/living/environment/eip/bos_environmental_agenda.pdf

This document is very significant in its potential for protection, preservation, and restoration of the county's natural resources. EQAC continues to commend the Board of Supervisors for adopting this vision and for the steps it is taking to implement these recommendations.

2. Department of Public Works and Environmental Services

a. Stream Restoration

DPWES was involved in a number of stream restoration projects. Bioengineering techniques are being used where possible. The following projects were in progress or completed in 2007:

Table VII-1. DPWES Stream Restoration Projects in 2007

PROJECT NAME	PROBLEM	SOLUTION
Pleasant Ridge	Streambank Erosion	Installed 125 linear feet elliptical storm pipe, 4 storm structures and site restoration work
Hunters Branch	Stream Channel Blockage	Clean-up and blockage removal
Runnymede	Streambank Erosion	Installed riffles, pools, rock weirs/vanes, energy dissipaters, rock revetments and vegetation to re-establish stream buffer.
Governor's Run Phase 1 & 2	Severe Sedimentation	Constructed access road, fore-bay, stream restoration, landscaping and tree plantings at Lake Martin
County-wide	Stream Channel Blockage	Remove debris from stream channels
Americana Drive	Streambank Erosion	Restored 50 linear feet of stream bank
Woodland Avenue	Streambank Erosion	Installed 80 linear feet of riprap
Balmacara Phase II	Streambank Erosion	Stabilized streambank with gabion basket walls, riprap and soil stabilization
Colonies at Scott Run	Streambank Erosion	Stabilized streambank with gabion basket walls, riprap and soil stabilization
English Hills	Streambank Erosion	Stabilized 175 linear feet of streambank with gabion basket walls, riprap and soil stabilization
Little Pimmit Run*	Severe Stream Erosion with Exposed and Threatened Sewer Lines	Restored 675 linear feet using natural stream channel design. Construction included two imbricated stone walls, 5 J-hooks, cobble, bankful benches, riffles and pools, an integrated trail crossing, floodplain and upland grading, and planting with native grasses, shrubs and trees.
Waverly Park Culvert Replacement (DPWES partnership with NVSWCD)	Severe Stream Erosion around Culvert Pipes	Removed 4 x 48" corrugated culvert pipes on Wolftrap Creek at two trail stream crossings and replaced with two fiberglass bridges (35' and 45' in length)

*NVSWCD (project lead), in partnership with FCPA, DPWES, the Dranesville District Supervisor, a private engineering firm and a private construction company.

Source: 2008 EQAC Information, Attachment to email, Information for 2008 EQAC Annual Report (DPWES/STW-SPD IQ #187747), from Dean Blackwell, Department of Public Works and Environmental Services, Fairfax County, Virginia, to Noel Kaplan, Department of Planning and Zoning, Fairfax County, Virginia, July 2, 2008

b. Green Roof Technology

DPWES constructed a vegetated roof demonstration project on part of the Herrity Building parking garage. This project is being managed by the Facilities Management Division with support and funding provided by Stormwater Management. This demonstration project is intended to provide an easily accessible example of different vegetated roof technologies and methods for educational and research purposes. Government staff and those in the building industry, as well as residents and students of all ages, will benefit from this educational installation. Ongoing monitoring of this demonstration project is in progress, with interpretive signage to be installed in 2008.

3. Fairfax County Park Authority

The Fairfax County Board of Supervisors created the Fairfax County Park Authority in 1950, authorizing the Park Authority Board to make decisions concerning land acquisition, park development, and operations. As a result, Fairfax County has a system of parks that serve a number of uses, including active recreation such as sports, historic sites and buildings, and preserving environmentally sensitive areas such as forests and stream valley lands. For current information on the county’s parks, visit the FCPA Web site at <http://www.fairfaxcounty.gov/parks/>.

a. Acquisition of Park Land by FCPA

The FCPA added 169.5 acres between July 2007 and July 2008. This brings the parkland inventory to a total of 24,148 acres (which equates to 9.55 percent of the land mass of Fairfax County) as of July 2008.

FCPA purchased the following properties:

- Jean W. Pease, Trustee, 1.9615 acres. This parcel is in Mount Vernon District and provides an additional access point to Old Colchester Park and Preserve.
- William Milton Williams and Robert Orville Williams, 1.0925 acres. This parcel is in Mount Vernon District and provides an additional access point to Old Colchester Park and Preserve.

FCPA acquired the following properties through dedications:

- Fairfield Dulles Corner, LLC, 4.2916 acres. This proffer agreement included the dedication of land and a ball field in Hunter Mill District.
- Fairfield Dulles Corner, LLC, 2.3986 acres. This proffer agreement included the dedication of land in Hunter Mill District.

FCPA acquired the following properties through transfers:

- Fairfax County Board of Supervisors--Thirty seven separate transfers
- Fairfax County Redevelopment and Housing Authority--One transfer

b. Natural Resource Management Plan

In past reports, EQAC recommended that the Fairfax County Board of Supervisors develop and implement a countywide Natural Resource Management Plan. EQAC noted that in order to do this, two tasks need to be accomplished first: complete a countywide Baseline Natural Resource Inventory and adopt a unified Natural Resource Conservation Policy.

EQAC's past recommendation on developing a countywide Natural Resource Management Plan has been partially fulfilled by FCPA. On January 14, 2004, the Park Authority Board approved the Natural Resource Management Plan for Park Authority property. The NRMP contains seven elements:

- Natural Resource Management Planning
- Vegetation
- Wildlife
- Water Resources
- Air Quality
- Human Impact of Parklands
- Education

The complete NRMP can be viewed at <http://www.fairfaxcounty.gov/parks/nrmp.htm>.

Some of the highlights of year four (FY 2008) included:

- Policy and Best Practices
 - Drafted a non-invasive plant policy for plantings on parkland
 - Identified best practices and policy needed throughout the agency
- Partnerships
 - Continued partnerships with Environmental Coordinating Committee, Environmental Quality Advisory Council, Department of Public Works and Environmental Services, Northern Virginia Soil and Water Conservation District, Virginia Department of Forestry, Earth Sangha, and others
 - In partnership with Earth Sangha created a native arboretum at the Marie Bulter Leven Preserve

- In partnership with Earth Sangha, NVSWCD, and VDOF, built a rain garden at the Marie Butler Leven Preserve
- Invasive Non-native Species
 - Continued and expanded the Invasive Management Pilot Program
 - Developed scope for a countywide survey and prioritization report
 - 40 volunteer leaders led 935 volunteers in 4,300 hours of stewardship service
 - 1,300 native plants were re-established on about 34 acres of parkland
- Water Resources and Low Impact Development
 - Worked with DPWES to refine the process of reviewing, coordinating and implementing watershed plan projects
 - Continued implementation of LID demonstration projects (funded in support of the Board of Supervisors Environmental Agenda). Rain gardens have been constructed at Wakefield, Cub Run, and Mt. Vernon RECenters and a swale will be developed at Greendale
 - LID features incorporated in other site improvements including a LID parking lot at Hidden Oaks Nature Center
 - Began a stream stabilization project at Turkeycock Run
 - Continued the Huntley Meadows Wetland Restoration project
- Stewardship Education
 - Produced three new brochures (Underground World, Water and Night)
 - The Stewardship Education Team developed educational materials about storm drains (posters, window clings, brochures and buttons), trained staff and installed storm drain markers at all staffed parks

While the Park Authority has made a great step forward with the adoption of the NRMP, more resources (people and funds) need to be devoted to the implementation of the plan. Furthermore, inventories of all parks need to be accomplished. The inventory needs to be extended to cover all of Fairfax County so that future planning for acquisition of sensitive lands can take place.

Unfortunately, insufficient staffing and funding are limiting implementation of the NRMP. The Fairfax County Park Authority staff lacks a number of functions and capabilities in regard to the NRMP: natural land managers, ecologists, restoration specialists, water resource specialists, wildlife specialists, planner and project managers. EQAC does support increased funding for this purpose, but also notes that obtaining some of the needed positions from within internal resources also can be done. EQAC recognizes that personnel cannot just be transferred from another job (and skill set) to this program, but increased staffing can be accomplished by

hiring a new person with the right skills when normal attrition happens elsewhere on the FCPA staff.

c. Green Infrastructure/Natural Resource Mapping Effort

The goal of this project is to develop a framework for modeling ecologically significant resources to support land use and development decisions in Fairfax County. This information will also be used as needed by FCPA to provide for informed land acquisition decisions as well as to support park planning processes. The successful achievement of this effort will satisfy a long-standing EQAC recommendation.

A demonstration model will be conducted for the Sully Woodlands region and the results used to refine the model protocol. Development of the model for the entire county will be considered based upon the results of this study and the availability of funding. The scope of work is developed and the project should be underway in 2007 with a late 2008 completion date.

d. Invasive Plant Control Efforts

Invasive plants are a problem because they can out compete and replace native species. This change in vegetation disrupts the life cycles of many flora and fauna that depend on native vegetation. The Park Authority's Strategic Plan includes a strategy to develop invasive plant guidelines for consideration by the Environmental Coordinating Committee as a countywide standard.

A number of volunteers have enabled the Invasive Management Area program to be established at 36 sites with 41 trained volunteer leaders. This program works on plots of land, typically ½ acre, to remove priority invasive species.

The Invasive Conservation Corps is an internship opportunity offered by FCPA for the first time in summer 2007. Nine graduate and undergraduate interns performed mechanical control of invasive plants at 21 sites. The program was extended into 2008 with a five-intern crew working through August 1.

FCPA continues with outreach and education in this area. FCPA published another brochure, *Non-Native Identification and Control*, completing its invasive plant stewardship series.

EQAC continues to commend the volunteers and the Park Authority staff who are cooperating in removing invasives; an increased effort should be established using dedicated funds for this purpose.

e. Riparian and Bioengineering Projects

The Fairfax County Park Authority, along with and in partnership with other agencies, continues to work on stream stabilization/bioengineering projects. See the Water Resources Chapter of this report for descriptions of these projects. The stream restoration projects were the Turkeycock Run Stream Stabilization, encompassing about 1,000 linear feet in Green Spring Garden, and the Little Pimmit Run project, which included over 500 linear feet.

f. Environmental Stewardship

FPCA does offer a number of opportunities for volunteers and EQAC encourages county residents to take advantage of these opportunities. Information about these opportunities is available at <http://www.fairfaxcounty.gov/parks/volunteer.htm>.

More information about FPCA and its programs is available at these Web sites: <http://www.fairfaxcounty.gov/parks/resources/stewardship.htm> and <http://www.fairfaxcounty.gov/parks/resources>.

g. Fairfax County Park Foundation

Fairfax County citizens can donate to the Fairfax County parks through the Fairfax County Park Foundation. The Fairfax County Park Foundation is a 501(c)(3) not-for-profit organization and donations are tax deductible to the fullest extent allowed by law. The Foundation's mission is to raise funds to support the parks and land under the stewardship of the Fairfax County Park Authority. Less than half of the Park Authority's annual operating funds come from tax support. The Foundation's goal is to bridge the gap between income from tax support and user fees, and the cost to operate, maintain and preserve the county's park system. Those interested in giving tax-deductible donations to the Foundation, can contact the Foundation at:

Fairfax County Park Foundation
 12055 Government Center Parkway
 Fairfax, VA 22035
 (703) 324-8581
SupportParks@aol.com
<http://www.FairfaxCountyParkFoundation.com>

4. Northern Virginia Regional Park Authority

Three Northern Virginia counties (Fairfax, Loudoun and Arlington) and three cities (Alexandria, Fairfax and Falls Church) participate in the Northern Virginia Regional Park Authority. NVRPA was founded in 1959 and owns and operates 19 regional parks and owns 10,256 acres of land throughout the region.

NVRPA has been in discussions with land owners along the Occoquan River regarding NVRPA's interest in land donations or acquisitions to expand its parkland along the river. In 2008, NVRPA signed an easement expanding protected open space along the Washington & Old Dominion Trail. This easement, the Wedderburn property in the Providence District, provides a two-acre buffer to the trail.

NVRPA completed certification by Audubon International of all three of its golf courses as Wildlife Sanctuaries. This extensive process took NVRPA over a year to complete, and NVRPA is the only public agency in the Mid-Atlantic region to achieve this designation for any of its golf courses.

NVRPA worked with EPA and the Virginia Department of Agriculture and Consumer Affairs to develop an aggressive pesticide and fertilizer use policy. This policy goes far beyond the law and has been implemented it at all of NVRPA's parks. This is particularly important since NVRPA parks are overwhelmingly riparian areas adjacent to local drinking water supplies.

Current information about the Northern Virginia Regional Park Authority can be found on its Web site, <http://www.NVRPA.org/> and its current annual report is at <http://euclid.willetts.com/www.nvrpa.org/documents/file/AnnualReport2007WEB.pdf>

5. Fairfax ReLeaf

Fairfax ReLeaf is a non-profit (501(c)(3)), non-governmental organization of private volunteers who plant and preserve trees, restore forest cover, restore habitat and improve community appearance in Northern Virginia. The organization appreciates and supports the county's new goals to increase the tree cover in Fairfax County. Fairfax ReLeaf contributed to this goal by nearly doubling the number of tree seedlings planted over the previous year. Fairfax ReLeaf is very active in tree plantings and is always eager to sign up new volunteers. These tree plantings lead to a number of benefits:

- Improved air quality
- Reduced heat island effects
- Reduced noise
- Preservation of human and wildlife habitats

- Reduced energy use
- Reduced surface runoff and improvement of water quality

Fairfax ReLeaf remains very active in its efforts; the organization planted or distributed 3,860 trees in calendar year 2007. Volunteers spent over 3,000 hours planting tree seedlings, removing invasive species and maintaining sites. Some specific activities were:

- Distribution of over 800 seedlings to individuals and homeowner associations for planting
- Removal of invasive plants in the cloverleaf off of I-395 south and in Idylwood Park
- Planting of over 1,000 trees in parks
- Planting of over 200 trees at school sites
- Reforestation of a homeowner association site around Lake Martin by the planting of nearly 500 trees

For further information on Fairfax ReLeaf, visit its Web site at <http://www.fairfaxreleaf.org>. The organization can be reached at:

Fairfax ReLeaf
 12055 Government Center Parkway
 Suite 703
 Fairfax, VA 22035
 Telephone: (703) 324-1409
 Fax: (703) 631-2196
 Email: trees@fairfaxreleaf.org

6. Northern Virginia Conservation Trust

Past EQAC reports recommended that the Fairfax County Board of Supervisors form public-private partnerships for the purpose of obtaining easements on environmentally sensitive land. EQAC pointed out that entities such as The Nature Conservancy use easements very successfully as a way of protecting environmentally sensitive properties. With the signing of a Memorandum of Understanding on June 20, 2001 between the Fairfax County Board of Supervisors and the Northern Virginia Conservation Trust, such a public-private partnership now exists. The partnership is now in its seventh year with recent funding for FY2008.

NVCT was founded in 1994 as the Fairfax Land Preservation Trust. In 1999, the Trust changed its name to The Northern Virginia Conservation Trust to better reflect the regional scope of the service area. NVCT is a 501(c)(3) nonprofit land trust dedicated to preserving and enhancing the natural and historic resources of Northern Virginia. NVCT also has formed public-private

partnership with Arlington County and the City of Alexandria, and owns properties or easements in Arlington, Fairfax, Loudoun, Prince William and Stafford Counties and in the cities of Alexandria and Fairfax.

From the time NVCT accepted its first easement in 1999 through June 2008, NVCT has preserved about 655 acres of open space in Fairfax County through easements, fee simple ownership, and partnerships. Between July 2007 and June 2008, NVCT permanently protected four acres along Piney Run in Lee District, and granted a trail easement to the Park Authority to complete the last segment of the Pimmit Run Trail from Old Dominion Drive to Pimmit Ben Park (which was opened with much fanfare by the Chairman of the Board of Supervisors). NVCT has numerous other projects close to completion, including conservation easements, fee acquisitions and trail easements.

Tables VII-2, VII-3 and VII-4 provide details on all these properties.

NVCT also has a public outreach program – Adventures in Conservation – to bring hands-on volunteerism and environmental education opportunities. These activities included the planting of native trees, the removal of invasive plants, birding trips and guided hikes. NVCT naturalist-led kayak tours, part of its innovative environmental and conservation education program, “floating classrooms,” continue to be a huge success.

NVCT was listed in this year’s Catalogue of Philanthropy as one of the best small charities in Northern Virginia and so recognized by the Board of Supervisors with a special award presented on July 9, 2007.

EQAC encourages all landowners whose property contains environmentally sensitive land such as wetlands, stream valleys and forests to consider contacting NVCT and learning more about easements. If these landowners grant easements, they will not only protect sensitive land, but can realize some financial benefits. A perpetual easement donation that provides public benefit by permanently protecting important natural, scenic and historic resources may qualify as a Federal tax-deductible charitable donation. Under the Virginia Land Conservation Act of 1999, qualifying perpetual easements donated after January 1, 2000 may enable the owner to use a portion of the value of that gift as a state income tax credit. Fairfax County real estate taxes could also be reduced if the easement lowers the market value of the property.

Additional information on NVCT can be found on its Web site, <http://www.nvct.org>.

Table VII-2. Easements Obtained by the Northern Virginia Conservation Trust			
District	Location	Acreage	Recordation
Braddock	Annandale	2.6	5/28/2004
Dranesville	Great Falls	5.6	12/1/2000
Dranesville	Great Falls	5	12/22/2005
Dranesville	Great Falls	14.07	7/3/2003
Dranesville	Great Falls	4.2	12/22/1999
Dranesville	Great Falls	5.1	8/14/2001
Dranesville	Great Falls	5	12/28/2000
Dranesville	Great Falls	5	7/18/2001
Dranesville	Great Falls	5	8/14/2001
Dranesville	Clifton	5.3	5/27/2003
Dranesville	McLean	62.7783	11/20/2006
Dranesville	McLean	7.7717	11/20/2006
Dranesville	McLean	1.9	12/14/2005
Dranesville	McLean	41	12/27/2005
Dranesville	McLean	6	8/1/2002
Dranesville	McLean	5.03	12/18/2006
Hunter Mill	Vienna	0.39	3/28/2003
Lee	Alexandria	3.98	1/8/2008
Mason	Alexandria	1.58	12/27/2002
Mt. Vernon	Lorton	33.73	5/18/2002
Mt. Vernon	Alexandria	0.4	
Mt. Vernon	Alexandria	0.92	6/20/2003
Mt. Vernon	Mason Neck	9	12/19/2003
Mt. Vernon	Alexandria	0.34	6/6/2005
Providence	Falls Church	1	4/14/2004
Providence	Falls Church	2.5797	3/10/2003
Providence	Falls Church	1.98	3/10/2003
Providence	Falls Church	1.56	3/10/2003
Providence	Falls Church	1.12	3/10/2003
Springfield	Springfield	0.87	10/30/2002
Springfield	Springfield	0.77	11/26/2002
Sully	South Riding	226	12/19/2003
Sully	Fairfax	1.51	7/17/2003
	Total	469.0797	

Source: *EQAC Update*, Email from Whit Field, Vice President and General Counsel, Northern Virginia Conservation Trust, Fairfax County, Virginia, to Robert McLaren, August 9, 2008.

Table VII-3. Fee Simple Properties Owned by the Northern Virginia Conservation Trust			
Property/District	Location	Acreage	Recordation
Clifton Property/Dranesville	Clifton	8.66	Gift 6/2003
Davenport/Pimmit Run/ Dranesville	McLean	1	Gift 8/2000
Mason	Springfield	0.001	Gift 3/2005
Little Hunting Creek/ Mt. Vernon	Alexandria	2.01	Gift 2002
	Total	11.671	

Source: *EQAC Update*, Email from Whit Field, Vice President and General Counsel, Northern Virginia Conservation Trust, Fairfax County, Virginia, to Robert McLaren, August 9, 2008.

Table VII-4. Land Turned Over to Local Government and Associated Acreage			
Property/District	Location	Acreage	Recordation
Bannister Outlots/Springfield	Springfield	0.6	12/2001
	Total	0.6	
Assisted Acreage			
Property/District	Location	Acreage	Recordation
Turner Farm/Dranesville	Great Falls	17	1998/99
FCPA Elklick/Sully	South Riding	157	12/2003
	Total	175.2	

Source: *EQAC Update*, Email from Whit Field, Vice President and General Counsel, Northern Virginia Conservation Trust, Fairfax County, Virginia, to Robert McLaren, August 9, 2008.

7. The Nature Conservancy

The Nature Conservancy has a very successful program of obtaining easements from property owners for conservation. Its program was the inspiration for EQAC's past recommendations for Fairfax County to seek conservation easements as a measure of protecting ecological valuable property. (This recommendation led to the public/private partnership with the Northern Virginia Conservation Trust mentioned above.) The Nature Conservancy does not hold any easements in Fairfax County at present; however, it owns one preserve (the Fraser Preserve) of approximately 233 acres on the Potomac River. For further information on The Nature Conservancy, see <http://www.nature.org>.

8. The Potomac Conservancy

Other organizations also hold easements in Fairfax County. This and the following paragraphs report on these organizations. One of these is the Potomac Conservancy. This organization was formed in 1993 by individuals concerned about inappropriate development, clear cutting and other activities that were beginning to have a negative impact on the unspoiled character of the Potomac Gorge. This led to the formation of the nonprofit land trust now known as the Potomac Conservancy. The Conservancy was incorporated on August 24, 1993 in Maryland as a nonprofit corporation. The Conservancy is registered in Maryland, Virginia and West Virginia, and is an easement holder in Maryland's Conservation Reserve Enhancement Program.

The Potomac Conservancy currently holds easements of four properties in Fairfax County. These properties total 13.46 acres with 0.14 of that being river frontage. For further information on the Potomac Conservancy, see <http://www.potomac.org>.

9. The McLean Land Conservancy

The McLean Land Conservancy was formed to promote and foster the preservation, protection, conservation and balanced use of the McLean area's unique natural, cultural, recreational and historic resources. MLC's main objective is to preserve open green space.

MLC has worked to raise awareness of the value of protecting natural resources. A healthy balance of land use will maintain and enhance the character and quality of life in McLean, as well as the economic sustainability of the region in the face of rapid build-out.

MLC is a 501(c)(3) land trust organization that was incorporated in the Commonwealth of Virginia in January 2000 and recently became a "full-fledged" land trust in Virginia, with the ability to hold conservation easements. As a result, the conservation easements MLC identified and negotiated before July 2004 were deeded to Fairfax County, but with MLC assigned as the easement monitor.

MLC has concentrated on the preservation of riparian buffers on privately owned land. Successful projects include the protection of one acre adjacent to the headwaters of Four Mile Run, important because the health of the headwaters is critical to the health of a stream, and 2.77 acres on Pimmit Run in a pristine wooded area. These two easements are held by Fairfax County but monitored by MLC.

10. The National Park Service

Another holder of conservation easements in Fairfax County is the National Park Service. NPS holds 38 easements covering 326.67 acres. A future Annual Report on the Environment will provide more details on these easements.

11. The Virginia Outdoors Foundation

The Virginia Outdoors Foundation was created by an Act of the Virginia General Assembly (Chapter 18 of Title 10.1) in 1966. VOF is defined by the Act as a ‘body politic’ of the Commonwealth and is governed by a seven member Board of Trustees appointed by the governor for four-year staggered terms. The Attorney General’s Office has opined that VOF is both a State Agency and an independent instrumentality. The VOF was established “...to promote the preservation of open-space lands and to encourage private gifts of money, securities, land or other property to preserve the natural, scenic, historic, scientific, open-space and recreational areas of the Commonwealth.” The primary mechanism for accomplishing VOF’s mission is through open-space easements. Open space easements allow land to continue to be privately owned but restricted to serve and protect land for the public good.

The Virginia Outdoors Foundation currently holds six easements in Fairfax County as shown in Table VII-5. Additional information about VOF can be seen at its Web site: <http://www.vofonline.org/>.

Table VII-5. Easements Held by the Virginia Outdoors Foundation in Fairfax County		
Original Donor*	Acreage	Date Recorded
Thayer, Virginia Pratt and Robert H.	59.33	10/30/1969
American Horticultural Society	8.15	10/03/1978
McCormick-Goodhart, Nita Emma et al.	26.665	06/13/1988
McCormick-Goodhart, Nita Emma et al.	5.25	06/13/1988
McKee-Bennett, Thistle	20.47	12/28/1990
Ridder, Marie W. and Albert Andrews, Jr., trustees	7.858	12/23/1998
Total Acreage under Easement	127.723	

Source: 2008 Annual Report, Attachment to email, VOF Info for 2008 Annual Report, from Erika Richardson, Stewardship Specialist, Virginia Outdoors Foundation, Warrenton, Virginia, to Noel Kaplan, Department of Planning and Zoning, Fairfax County, Virginia, July 1, 2008.

* Note that the original donors listed may not be the current landowner of record as the eased property may have been sold since the deed of easement was recorded.

12. Northern Virginia Soil and Water Conservation District

The Northern Virginia Soil and Water Conservation District continues to provide leadership in the area of bioengineering techniques in streambank stabilization and in the general area of erosion and stormwater control. NVSWCD works in partnerships with other agencies and organizations. For example, it has partnered with the Fairfax County Park Authority, Virginia Department of Forestry, the Fairfax County Department of Public Works and the Reston Association. See the Water Resources chapter in this report for descriptions of stream stabilization/bioengineering projects for which NVSWCD has provided leadership.

The Fairfax County Chesapeake Bay Preservation Ordinance and Agricultural and Forestal District Ordinance require land in agricultural use to have a soil and water quality conservation plan. In Fairfax County, horse keeping operations are the predominant agricultural land-use. They are located mainly in the northern, western and southern areas of the county, and range from 5 to more than 100 acres. Plans include best management practices to reduce: erosion and sediment pollution from pastures and stables; excess nutrients from animal waste and fertilizers; and the misuse of pesticides and herbicides. The plans also include the establishment and maintenance of vegetated riparian buffers next to all streams and water bodies in Resource Protection Areas. Plans are updated and technical assistance is provided as needed. In 2007, seventeen soil and water quality conservation plans were prepared for 355 acres, which included 7,700 linear feet of stream buffers. All plans comply with the requirements of the Chesapeake Bay Program and several of the conservation plans also meet the county's requirements for the establishment or renewal of Agricultural and Forestal Districts. One manure composting facility was constructed for a horse operation with the help of funding through the state cost-share program. During 2007 and 2008, four conservation plans were prepared to assist landowners in correcting pollution problems identified through complaints made under the Virginia Agricultural Stewardship Act.

NVSWCD's annual seedling program emphasizes the role of vegetation in preventing erosion, conserving energy, and decreasing and filtering stormwater runoff. Those planted in riparian areas also help to protect stream channel stability and stream water quality, as well as improving the surrounding habitat. This seedling program offered citizens a package of native tree and shrub seedlings for a small cost. In 2008, a variety of 6,000 native seedlings were bundled into 420 packages and sold at a small cost to individuals and groups to promote urban reforestation, habitat enhancement and water quality protection. The package, named a "Butterfly Buffet," contained six varieties of trees and shrubs that provide both habitat and food for butterflies. Seed packets of butterfly weed and Black-eyed Susans also were included.

NVSWCD is the local sponsor of **Envirothon**, a hands-on competition among high school teams to demonstrate their knowledge of natural resources – forestry, soils, wildlife, aquatic ecology – and special issue topics, such as urban-rural interface and recreational stress on natural resources. Local and regional competitions are held in April, and the state competition is in May. In 2008, the Hidden Pond Ecology Club, comprised of students from several county high schools, came in second in the regional competition. In the state competition, the team took first place in the special issue oral presentation category and came in fifth overall.

The **Neighborhood Ecological Stewardship Training** Program is a series of hands-on workshops and outings that connect people to their environment and inspire stewardship. In 2008, from March through July, 261 adults participated in the program, enjoying and learning about their local natural resources through the arts and sciences. Seventy-three organizations, writers, artists and scientists partnered with NEST to provide a range of classes and activities from watershed explorations by land and water, to soils art, bat habitat and stream ecology. Over 115 activities were linked to the NEST program. More information is available on the Web site at www.exploreyournest.org.

At the bi-monthly Saturday morning **Green Breakfasts**, interested citizens, county officials and agency staff, state legislators, students, members of the business community and representatives of local non-profits and environmental groups discuss environmental topics, share information and network. Each breakfast begins with a presentation. In 2007, topics included: Invasive Management and Ecological Stewardship Training Programs; the Tree Action Plan; the Chesapeake Bay Program Forestry Initiative; Land Conservation; Cool Counties; and the Virginia Wildlife Action Plan. The Green Breakfast coordinator also sends announcements about programs and events, including county initiatives, and other topics.

Conservation Currents, the NVSWCD quarterly newsletter, includes many articles related to ecological resources. In 2007, topics included: managing invasives in parks; the value of trees near streams, as shown in a riparian temperature monitoring project; the Meherrin scenic river; the rain barrel program; sustainable agriculture; the storm drain marking pollution prevention program; the consequences of disappearing dogwoods; tax credits for energy efficient homes; launching the Fairfax Chapter of the Virginia Master Naturalist Program; watershed improvements at the Mt. Vernon Unitarian Church; the results of the evaluation of 20 Rain Gardens; the Little Pimmit Run stream restoration; rehabilitation of the Pohick Creek Watershed dams; why are some plants pests; and Growing Native. Editors of homeowner association newsletters and other materials are encouraged to use the articles in their publications.

Formed in 2006, the Fairfax Chapter of the Virginia Master Naturalist Program provides local residents with naturalist training and then connects them with volunteer stewardship, citizen science and education opportunities in parks and natural areas. The process for becoming a certified Virginia Master Naturalist takes from six to 12 months. Two times a year, approximately twenty-five candidates are selected for a class. They begin with a 60-hour basic training course, which is a combination of classes and field work that grounds them in natural history and forest and aquatic ecology. Subject matter experts from the Northern Virginia Regional Park Authority, Fairfax County Park Authority, Virginia Department of Forestry, Virginia Tech, Northern Virginia Soil and Water Conservation District, EPA and National Academy of Sciences make up the faculty. Master Naturalists are expected to provide much-needed support to the many environmental organizations striving to protect natural resources in Fairfax County. Graduates provide 40 hours of volunteer service each year, undergo an annual recertification and take advanced training.

Fairfax Soil Survey and Soil Scientist. The county provided funding to NVSWCD to continue the expertise of a soil scientist. During the past year, the soil scientist has continued to facilitate the transition from the old to the new soil survey information. Descriptions of all 119 soils have been published in the *Description and Interpretive Guide to NRCS Mapped Soils in Fairfax County*. Also, county-specific ratings for the new soils and assignment of problem classes to the updated soils have been completed. The soil scientist and staff from DPWES are collaborating on updating codes and procedures, notifying industry and ensuring a smooth transition to using the new survey. A template map has been completed that will be available as a PDF (one for each tax grid) to the public through the county Web site. Also, new GIS layers have been created for landfills, quarries, Marumsco soils, old Marine Clay soils, asbestos-containing soils, and other shrink-swell soils.

The soil scientist continues to assist with providing technical assistance to homeowners, homeowner associations, the development and construction community and county staff on soils-related matters and problems. Technical assistance on infiltration practices also is provided. During 2007, soils information was provided to 232 consultants, engineers, realtors and homeowners, and during the first half of 2008, soils information was provided in 104 reports.

13. Fairfax County Wetlands Board

If you own property on the waterfront in Fairfax County, you may need a permit from the Fairfax County Wetlands Board before you build or make improvements on your property. These activities, known as land disturbing activities, often require a permit if done in an area that has been identified as a tidal wetland. Land disturbing activities that may require a permit from the Wetlands Board include the following:

- Any construction project on or adjacent to a tidal body of water.
- Any construction project in which fill material is placed in or near tidal wetlands.
- Projects designed to protect property adjacent to shorelines.

The Wetlands Board evaluated four requests for Wetlands Permit Applications during 2008. The Wetlands Board seeks avoidance, minimization and mitigation or compensation for all tidal wetland impacts since the adoption of the Tidal Wetland Mitigation and Compensation Policy, which was adopted in 2005. The Wetlands Board received compensation for the wetland losses, which have resulted from permitted wetland impacts over the year at the board's approved rate of \$28 per square foot.

Restorations were completed for the three wetlands ordinance violations for which the Wetlands Board sought resolution between 2006 and 2007. To satisfy the board's condition that monitoring be conducted for three subsequent years following completion of the restorations, the subject property owners submitted photographs as part of the monitoring process to ensure the success of the restored wetland areas.

The Virginia Institute of Marine Science plays a crucial supporting role as academic advisors to tidewater localities in the administration of the tidal wetlands program. Carl Hershner, Director of the Center for Coastal Resources Management at VIMS announced significant changes in VIMS supporting role to the localities in an electronic advisory to local government staff in late May, effective as of July 2008.

The following excerpt from Hershner's advisory defines the new course.

“...We have incorporated the latest scientific understanding of tidal wetland functions in the form of revised permit application reports that stress preservation of ecosystem services....We have used our emerging understanding of climate change and its effects on natural resources as the basis for our Integrated Shoreline Management guidance. And, for the past year, we have focused

workshops and publications on the introduction and explanation of the integrated management approach.....

We are developing a more extensive training curriculum for local government planners and landuse managers to enable them to guide shoreline property owners to preferred project design alternatives....

We will continue to provide reports on permit applications, although we will rely more on desktop review and less on routine site visits.... We will continue to provide technical support for difficult cases within our resource limits. And, we continue to seek additional resources to build on and improve this suite of activities.”

For further information, contact the Wetlands Board at:

Fairfax County Wetlands Board Staff
 Department of Planning and Zoning, Planning Division
 12055 Government Center Parkway, Suite 730
 Fairfax, VA 22035-5504
 (703) 324-1210
<http://www.co.fairfax.va.us/dpz/environment/wetlands.htm>

14. Virginia Department of Forestry

The Virginia Department of Forestry has provided forestry related services in Fairfax County for over 55 years. VDOF is also participating in several efforts aimed at improving riparian zones. In these efforts, VDOF partnered with the Northern Virginia Soil and Water Conservation District, the Department of Public Works and Environmental Services, Fairfax County Park Authority, Fairfax ReLeaf and Earth Sangha.

The Virginia Department of Forestry is the lead state agency to oversee the planting and recordation of forest buffers planted in the state of Virginia. In 2007, approximately 5,500 seedlings were planted along 3,020 linear feet of stream corridors under the leadership of the Virginia Department of Forestry in Fairfax County. Partners involved in these plantings were Eagle Scouts, Earth Sangha, Elementary School Children, private landowners, Fairfax ReLeaf and the Potomac Conservancy.

The Virginia Department of Forestry participates in the Fairfax County Arbor Day on the last Saturday in April each year. The County earned again, for the 25th year, the Tree City USA award. This award is given for having a planting plan, management plan, a Tree Board/Commission, and sponsoring an Arbor Day Celebration. The award is applied for by the Fairfax County Urban Forest Management Division and given through the State Department of Forestry.

Tree seedlings are distributed by VDOF to citizens attending the Arbor Day celebration. In 2007, 350 seedlings were distributed for planting by residents in their communities.

The Virginia Department of Forestry sponsored a drop-off site in Fairfax County for the Growing Native project. This project involves the collection of tree seeds (acorns, hickory nuts, black walnuts etc.) which are transported to VDOF nurseries where the seeds are planted and seedlings are grown. In 2007, approximately 5,000 pounds of seeds were collected. Each year 500-700 seedlings are given to citizens for planting on public lands in Fairfax County.

The conservation of the forested land base in Fairfax County is a part of the VDOF plan. The Fairfax County office works closely with the Northern Virginia Conservation Trust to review easements for the conservation of forests. Also, Agricultural and Forestal District forest management plans are prepared by VDOF; these efforts support the management of forested land for conservation purposes. Eight A&F plans covering 349.6 acres were prepared in 2007. These plans provide detailed forest descriptions, information on protecting water quality, wildlife habitat and cultural resources, as well as a detailed five-year management plan that protects natural resources and promotes the landowner's management objectives. VDOF wrote two Stewardship Management plans covering 369.1 acres. VDOF also provides forestry management advice to Home Owners Association and Civic Groups. In 2007, five community forestry plans were prepared covering 85 acres.

The Virginia Department of Forestry also helps protect water quality and forest resources in the county by reviewing and commenting on rezoning applications and development plans. VDOF reviewed 65 applications and plans in 2007. In addition, VDOF annually inspects dry hydrants to make sure they are available to fight wildfires in the county.

The department maintains an active public education and out reach program. Audiences range from school groups to adults. Topics range from general discussion of the importance of urban forests for environmental quality to technical training in planning and installing rain gardens and forested riparian buffers. In 2007, VDOF conducted 26 talks on the general benefits of urban forests and riparian buffers.

15. Virginia Department of Transportation

The Virginia Department of Transportation mitigates unavoidable impacts to water resources within Fairfax County that occur during highway construction projects as required by federal and state laws and regulations. VDOT has created seven such wetland mitigation sites in Fairfax County:

- Approximately 0.5 acres off southbound Route 28 adjacent to Dulles Airport (Dulles site)
- Approximately two acres off westbound Route 7 adjacent to Sugarland Run (Sugarland Run site)
- Approximately 0.2 acres off southbound Route 29 adjacent to Big Rocky Run (Big Rocky Run site)
- Approximately two acres off northbound Route 6197, Roberts Parkway adjacent to the Burke Railway Express Station (Roberts Parkway site)
- Approximately 2.5 acres off northbound Route 228, Dranesville Road adjacent to Sugarland Run (Dranesville site)
- Approximately 2.5 acres off Route 1 on the Fairfax County side of Cameron Run (Woodrow Wilson Bridge Project – Belle Haven site)
- Approximately two acres will be constructed at the confluence of Taylor Run and Cameron Run Currently underway at the I-95/Telegraph Road interchange improvement (Woodrow Wilson Bridge Project – Cameron Run site)

These sites were created to mitigate unavoidable wetland impacts from construction of Route 28 widening, Fairfax County Parkway, Roberts Parkway Bridge Overpass, the Springfield Interchange Improvements, the Route 29 Bridge replacement over Big Rocky Run, and the Woodrow Wilson Bridge Replacement. All but the Woodrow Wilson Bridge Project sites have met wetland performance criteria. The Belle Haven site is in its fourth year of monitoring and the Cameron Run site monitoring will begin when its creation is complete.

Water quality permits require created wetland mitigation sites to be monitored for a period of five years following completion of construction to assess their functionality. Monitoring reports indicate that these created wetlands are providing a valuable water quality benefit in their respective watersheds as well as habitat for a host of aquatic organisms, waterfowl, and other wildlife. These land parcels are deeded in perpetuity for preservation as a wetland; however, these open spaces are continually pressured for development by others. EQAC agrees with VDOT that these VDOT-owned wetland mitigation sites should be protected.

Federal and state water quality regulations are now requiring mitigation of streams impacted by transportation projects. VDOT completed approximately 135 feet of on-site stream restoration of a Pohick Creek tributary in 2004 during the widening of Richmond Highway between Telegraph Road and Lorton.

VDOT estimates the need for mitigation of about 6,400 linear feet of streams and 12 acres of wetland impacts based on VDOT's current Six-Year Plan. This number would increase if more funds for construction became available. However, VDOT notes that opportunities for stream restoration credit or

competitive purchase of commercial bank credits within the watersheds of Fairfax County are limited. Therefore, VDOT is interested in discussion of opportunities for potential stream restoration sites within and beyond the state's right-of-way. This could include partnering with Fairfax County agencies and private property owners. Another possible partner would be the Northern Virginia Soil and Water Conservation District. (For example, VDOT transferred ownership of a stream restoration design along Turkeycock Run to the Fairfax County Department of Public Works and Environmental Services, which will take responsibility to build any portion of the design through its own funding.) EQAC urges county staff and NVSWCD to explore such possibilities.

VDOT, in partnership with the Virginia Transportation Research Council and the University of Virginia, had been involved in several environmental research studies. The following research study is presently underway:

- *Effects of Sedimentation of Freshwater Mussels:* Sedimentation from VDOT projects is assumed by regulatory agencies to pose a major negative impact to mussels downstream of construction sites; however, there is no empirical evidence to support this assumption. The research project will test the assumption of sediment impacts and evaluate whether VDOT projects do or do not contribute to significant sedimentation above ambient stream levels. Completion date target is September 2009.

VDOT completed these research projects in FY08:

- *Assessment of Soil and Wash-water Quality Beneath Salt Spreader Storage Racks: Lubricant and Salt Quantification.*
- *Understanding the Environment Effects of Cured-in-Place Pipes for Utility Pipe Rehabilitation:*
- *Recycling of Salt-Contaminated Storm-Water Runoff for Brine Production at VDOT Road-Salt Storage Facilities.*

VDOT is participating in a joint pilot project with VTRC and the Fairfax County Department of Transportation on the use of low impact development measures for the proposed Lorton Connector Road in the Laurel Hill development. This five-year pilot project will monitor the effectiveness of LIDs in managing stormwater runoff from the roadway.

VDOT continues to include landscaping in several construction projects to enhance road improvements. Fairfax County projects include:

- Richmond Highway widening from Lorton Road to Telegraph Road (completed October 2005 and the landscaping is in the final year monitoring of a three-year establishment period)

- Ox Road between Davis Drive and the Prince William County Line (completed May 2006 and the landscaping is in the final year monitoring of a three-year establishment period)
- Backlick Road Park and Ride Lot (completed November 2007 and landscaping is in the first year of a one-year establishment period)

VDOT is including landscaping in projects currently underway or scheduled to start in the next 12 months:

- Route 1/Capital Beltway interchange improvements associated with the Woodrow Wilson Bridge Project (landscaping and reforestation to begin October 2008)
- Telegraph Road/Capital Beltway interchange improvements associated with the Woodrow Wilson Bridge Project (project currently underway)
- Route 50 Pedestrian Bridge over Route 50 at the Seven Corners Shopping Center (construction underway with landscaping in Fall 2008)

Approximately 12 acres of wildflower meadow plantings exist in Fairfax County. This total represents approximately the loss of five acres of meadows, primarily due to construction underway of the Capital Beltway/HOT/Bus/HOV Lanes Project. Other meadows have been abandoned due to consistently poor performance. The wildflower program is not funded for FY09 and VDOT will focus efforts on maintaining the vitality of the remaining meadows. VDOT will also continue to evaluate use of grass species for application in its roadside seed mix specifications.

VDOT has increased its integrated vegetation control of invasive, non-native vegetation along interstate and primary roads in Fairfax County. One specific problem is bamboo. Many residents plant this species along their property lines with the state right-of-way, but bamboo quickly spreads to interfere with drainage and visibility of highway signs. EQAC encourages property owners to find native alternatives to bamboo since this invasive plant does spread very rapidly and is difficult to control.

16. Urban Forest Management

a. Urban Forest Management Division

In addition to carrying out its core services relating to land development (see Forest Conservation Branch update) and forest pest management (see Forest Pest Branch update), in 2007, the Urban Forest Management Division of the Department of Public Works and Environmental Services focused on several other projects that included:

- County Receives Tree City USA and Growth Award: For the 25th year, Fairfax County received the Tree City USA Award and its fourth Growth Award from the National Arbor Day Foundation. UFMD prepares the applications each year for these awards and Fairfax County has one of the ten longest running records in Virginia.
- 30-year Tree Canopy Goal:. According to long-range tree canopy modeling by UFMD, even if our community continues to preserve and plant trees at present levels of effort, our tree canopy will decrease in size from 41 percent to around 37 percent over the next 30 years. This loss (10,200 acres) equates in area to seven Huntley Meadows Parks and will go hand in hand with the loss of significant levels of environmental and social services associated with tree canopy such as air pollution removal, carbon storage, energy conservation and stormwater management. An initial analysis of the tree planting potential of 31,357 acres of county-owned property and 15,500 acres of commonly-owned open space found that only 4,200 acres have potential for additional tree planting. The same analysis found that 33,170 of 107,000 (31 percent) acres of low density residential land showed potential to accommodate additional trees. Therefore, the lion's share of tree planting will need to occur on privately-owned residential lots.

In order to reverse the loss and to actually increase canopy levels, the Board of Supervisors adopted a 30-year tree canopy goal of 45 percent on June 18, 2007. Fairfax County is the first large jurisdiction in Virginia to officially adopt a tree canopy goal.

Reaching this goal requires that we increase our present canopy levels by approximately 20,400 acres by the year 2037. Although canopy gains are expected from natural processes, this goal requires a large-scale tree planting program spread over a 30-year period. At present, our community is estimated to plant 21,000 trees annually. The adopted goal requires that we increase current planting levels to an average of 84,000 trees annually. The total numbers of trees that are needed to reach 45 percent is estimated at 2.6 million.

The Urban Forest Management Division has estimated that it will cost our community between 250 to 500 million dollars to install this number of trees depending on the size and species of trees that are eventually planted. However, the benefits provided by the added tree canopy should more than offset costs associated with planting and maintaining the new canopy. The UFMD has noted that the stormwater management capacity that is associated with 21,000 acres of mature tree canopy is estimated to cost \$510,632,400 to construct, and that this sum alone would offset the total cost estimated for this 30-year tree planting proposal. UFMD also estimates that this canopy increase would have

the capacity to provide an additional 5.3 million dollars of air pollution removal and 4.7 million dollars of energy conservation services each year for the life of the trees, which could easily reach 70 years or more.

- Implementation of the Tree Action Plan: In 2007, UFMD, in conjunction with the Fairfax County Tree Commission, developed, and the Board of Supervisors endorsed, the Tree Action Plan. The Tree Action Plan is a 20-year strategic plan for the conservation and management of the county's tree and forest resources. Over the past year, UFMD staff has made significant progress towards meeting goals and executing strategies of the plan. UFMD is currently engaged in 27 strategies associated with 10 out of 12 Core Recommendations of the Tree Action Plan. The 12 Core recommendations are:

1. Engage and Educate (the community)
2. Build Strong Partnerships and Alliances
3. Optimize Tree Conservation in County Policies
4. Improve Air Quality and Address Climate Change through Tree Conservation
5. Improve Water Quality and Stormwater Management through Tree Conservation
6. Use Ecosystem Management to Improve and Sustain the Health and Diversity of our Urban Forest
7. Strengthen State-Enabling Authority for Tree Conservation
8. Encourage Sustainable Design Practices
9. Plant and Protect Trees by Streams, Streets and Trails
10. Optimize Tree Conservation in Land Development
11. Optimize Tree Conservation in Utility and Public Facility Projects
12. Support and Refine the County's Urban Forestry Programs

For more information on the Tree Action Plan, please use the following Web link:

<http://www.fairfaxcounty.gov/dpwes/environmental/trees.htm>.

- Tree canopy measure included in the 2007 Metropolitan Washington DC air quality plan: Tree conservation is an effective air quality management tool. The U.S. Department of Agriculture Forest Service estimates that every one percent increase in canopy cover results in maximum mid-day air temperature reductions of 0.07 to 0.36°F (0.04° to 0.2°C). Reduction of ambient air temperatures is just one of the ways that trees help improve air quality. Planting and preserving tree canopy improves air quality in several ways. Trees absorb pollutants from the air through leaf uptake and contact removal. By shading buildings, trees also lower demand for air conditioning energy, thereby decreasing emissions from power plants.

In 2007, the Northern Virginia Urban Forest State Implementation Plan Group joined a regional effort organized by the Metropolitan Washington Council of Governments. The MWCOG group contributed to the development of the “*Urban Heat Island Mitigation/Tree Planting/Canopy Conservation and Management*” measure. This new voluntary measure is included in the 2007 Metropolitan Washington eight-hour ozone air quality management plan and is one of only two in the entire United States to be approved by the U.S. Environmental Protection Agency.

Fairfax County committed to implementing the following practices in support of the *Urban Heat Island Mitigation/Tree Planting/Canopy Conservation and Management* measure:

- Fairfax County tree canopy requirement for new development
- Fairfax County parking lot canopy ordinance
- Fairfax County government land planting program
- Fairfax County countywide nonprofit tree planting program

Although only four components of Fairfax County’s urban forestry program are specifically identified, it should be noted that most, if not all, UFMD programs directly support efforts to keep our air clean.

- Northern Virginia Urban Forestry Roundtable The lack of regional communication over urban forestry issues has limited past efforts to obtain tree conservation legislation and to develop other effective programs and practices related to the management of trees and forest resources. The NVUFR was formed in 2005 to bring local environmental groups, tree commissioners and urban forestry officials together to examine ways to cooperate over regional issues such as efforts to obtain tree conservation legislation and to develop urban forestry practices and measures for ozone mitigation. UFMD provided leadership during the formation of NVUFR and has been instrumental in organizing regional conferences on trees and air quality since November of 2005. NVUFR activities increased in 2007, resulting in the development of several tree conservation bills that were reenrolled in, and ultimately adopted by, the 2008 Virginia Legislative Assembly. More information about 2007 and 2008 tree conservation legislative efforts is provided later under section e.
- New Ordinance to Preserve Heritage, Specimen, Memorial and Street Trees: In response to a directive from the Board of Supervisors at its June 5, 2006 meeting, UFMD and the Office of the County Attorney developed a new tree preservation ordinance based on the enabling authority of Section 10.1-1127.1 of the Code of Virginia which provides

authority to regulate the preservation and removal of heritage, specimen, memorial and street trees. The Board of Supervisors adopted this new ordinance on October 15, 2007. The new ordinance will be administered by UFMD and others in DPWES.

Heritage trees are trees that have notable historic or cultural interest. Memorial trees are trees that are special commemorating memorials. Specimen trees are trees that are notable by virtue of their outstanding size and quality for their species. Street trees are trees that have been planted by local governments in the right-of-way or on adjoining private property with the permission of the owner. Designation of a tree under the new ordinance may require easements to protect the natural vegetation, topography and other natural features within the tree's critical root zone. The identification of trees by citizens, citizen's groups and other organizations will be through the submission of a report proposing tree designation to UFMD. In addition to the report, and as a prerequisite for scheduling public hearing held to consider tree designation, all proposals to designate trees for protection under this ordinance must be accompanied by written consent from tree owners.

All individuals and groups identifying trees for potential designation are required to communicate proposals to designate trees to the owners and to secure written consent from owners in order for the county to consider the tree for official designation. Subsequent to designation, trees preserved under the ordinance may only be removed with permission of the board and the board may require replacement of trees approved for removal. Tree owners are required to undertake reasonable efforts to preserve and protect designated trees, including the critical root zone, and advise the Urban Forester of any trees that appear to be damaged, diseased or dying.

A civil penalty of \$2,500 may be assessed for violations of the ordinance that cause, contribute to or permit injury to, removal or destruction of a tree designated for preservation under the ordinance. Provisions also have been included in the ordinance to prohibit property owners from destroying any tree proposed for designation pending a recommendation by UFMD and/or decision by the board. In addition to the exemptions provided for in the state code, the ordinance exempts the maintenance and repair of water lines and sanitary sewer lines from the requirements.

b. Forest Conservation Branch

In 2007, the Forest Conservation Branch of the Urban Forest Management Division continued to serve its traditional customers: citizens; builders; developers; planners; engineers; landscape architects; private arborists; and other county staff and agencies, including the Board of Supervisors, Planning Commission, Tree Commission, Environmental and Facilities Review Division, Environmental and Facilities Inspections Division, Department of Planning and Zoning, Office of Capital Facilities, Park Authority and the School Board. Efforts included:

- Tree Planting on Government-owned Sites: Staff prepared planting plans and planted over 380 native and desirable trees at 28 county-owned facilities, including libraries, mental health centers, police and fire stations, government centers and more, to help meet the 30-Year Canopy Goal, adopted by the board in 2007.
- Education and Demonstration of Natural Landscaping Techniques: In cooperation with several county agencies, the branch designed a landscape plan and installed trees and shrubs at two stormwater management ponds on the grounds of the Government Center using natural landscape techniques as part of the Board of Supervisors Environmental Improvement Program.
- Improvements to the DPWES “Trees” Web Page: The Web page was upgraded with improvements such as:
 - Additional information for citizens and developers regarding natural landscape techniques, native plants, invasive plant species, model proffer language, the Tree Action Plan and hazardous trees
 - Adding “Tree Mail,” an avenue for citizens to ask general questions relating to trees and/or the urban forest and have a response from UFMD staff within 24 hours
- Tree Presentation and Planting Awards: Nominations were prepared for the Tree Commission of potential candidates for the Tree Preservation and Planting Awards. Awards for tree preservation are presented to recognize those developers and builders who have done an outstanding job of preserving trees on a project they have constructed. The Tree Commission awarded the 2007 Tree Preservation and Planting Awards to:
 - Carlton House/ Tree Preservation
 - Hawthorne Property, Section 2/ Tree Preservation
 - Squires Crest/ Tree Preservation

- Laurel Crest/ Tree Preservation
- James Lee Community Center/ Tree Planting
- Increased Public Awareness and Outreach: FCB staff continues to provide education and outreach to the public regarding the urban forest at many venues such as:
 - Talks to homeowners associations, scout groups and garden clubs
 - Participation in annual Earth Day/Arbor Day, Celebrate Fairfax and the 4-H fair with staff and educational exhibits
 - Providing staff and educational exhibits to the Mount Vernon Town Hall meeting and to the Providence District Workshop
- Natural Landscape Initiative: FCB staff continues to work cooperatively with various county agencies using GIS analysis to identify areas to reduce turf mowing activities and to identify potential planting sites for energy conservation and parking lot landscaping; staff has also developed model proffer language for implementation of natural landscape techniques.
- 2007 FCB Workload Summary: The following table summarizes the workload of FCB based on the requests for assistance that were completed for FY 2006, 2007 and 2008. These figures demonstrate the number of requests for assistance in 2007 appears to have increased by nine percent from the previous years.

Table VII-6. Forest Conservation Branch Workload, 2006 through 2008			
Type of Assignment	Number of Completed Requests		
	2006	2007	2008
Waivers	45	49	29
Zoning Cases	216	282	352
LDS ¹ Requests: Plan Review	676	628	586
LDS Requests: Site Inspections	726	810	978
Other (Board of Supervisors, Park Auth., Other County Agencies, etc.)	261	452	399
Hazardous Tree Investigations	8	8 ²	34
Total Completed	1,932	2,229	2,378

¹ LDS – Land Development Services. ² Completed requests for hazardous trees do not include nine requests referred to VDOT and other county agencies that were inspected by FCB staff, but for which no correspondence was generated.

c. Forest Pest Section

i. Gypsy Moth Caterpillar

The gypsy moth was first detected in Fairfax County in 1981. To avoid the environmental, economic and health hazards associated with this pest the Board of Supervisors enacted an Integrated Pest Management Program to control the gypsy moth. The purpose of the program is to reduce gypsy moth populations below defoliating levels. The goal of the program is to minimize the environmental and economic impacts of the pest by limiting the amount of tree mortality and use of pesticides in the environment. The control methods considered annually are:

- Mechanical: the gypsy moth egg mass Search, Scrape and Destroy Campaign and Burlap Banding for Gypsy Moth Caterpillars. These are citizen involvement programs
- Biological: the release and monitoring of gypsy moth parasites and pathogens
- Chemical: the aerial and ground applications of Diflubenzuron and Bacillus thuringiensis (Bt) on areas experiencing high infestations
- Educational: the self-help program and lectures to civic associations and other groups

In calendar year 2008 gypsy moth caterpillar populations remained stable compared to previous years. There was measurable defoliation reported in Fairfax County, the State of Virginia and other states in the northeastern United States. Staff from the Forest Pest Program determined that there were 15 acres defoliated in Fairfax County during the spring of 2008. According to the Virginia Department Forestry, there were 112,340 acres of defoliated forest in the state. No defoliation numbers are currently available for the United States; however, it is expected that they will be comparable to last year. The gypsy moth staff will continue to monitor populations in fall 2008; treatment is very probable in 2008.

ii. Fall Cankerworm

The fall cankerworm is native to the United States and feeds on a broader range of trees than the gypsy moth. Periodic outbreaks of this pest are common, especially in older declining forest stands. The area of the county that had the most severe infestations of fall cankerworm was in the Mount Vernon and Lee magisterial districts. Typically this insect will defoliate in the early spring when the trees are able to withstand the impacts and little long-term damage is expected; however, tree mortality

is possible when combined with conditions that place stress on the trees, such as drought. Nuisance to homeowners occurs when large numbers of caterpillars hang from the trees and migrate to the ground.

The Forest Pest Program conducted an aerial treatment program during the spring of 2003. Staff has monitored for adult female moths throughout the Mount Vernon and Lee Districts since January of 2001. The result of the winter 2007– 2008 monitoring effort indicated that no aerial treatment was required in spring 2008.

The Forest Pest Program will monitor for fall cankerworm again this winter. It is expected that populations of this pest will be low in the near future.

iii. Emerald Ash Borer

The emerald ash borer (*Agrilus planipennis*) is an exotic beetle from Asia that was discovered infesting ash trees in the state of Michigan in 2002. This beetle is known to attack only ash trees and can kill trees in as little as two years. After it was discovered, the United States Animal Plant Health Inspection Service quarantined the area that was infested. Unfortunately, a tree nursery owner inside of the quarantine area illegally shipped infested ash trees to a nursery in Maryland. During the summer of 2003, 13 of the ash trees were planted at the Colvin Run Elementary School site (Dranesville District). These trees were removed by the Virginia Department of Agriculture and Consumer Services and were incinerated.

The removed trees contained evidence that adult beetles had escaped into the environment. In order to prevent the beetles from becoming established in Fairfax County, APHIS and VDACS conducted an Emerald Ash Borer Eradication Program. It was ordered that all ash trees within a one-half mile radius of the school site must be removed and incinerated. This area included a total of 278 ash trees, 90 of which were on 29 privately owned properties. All tree removals were conducted in March of 2004. Subsequent monitoring has indicated that this eradication effort was successful.

In July 2008, two new infestations of emerald ash borer were discovered in Fairfax County in the Town of Herndon and in the Newington area. Staff believes that these infestations were not related to the one found at Colvin Run Elementary in 2004. The U.S. Department of Agriculture's Science Advisory Council has recommended that no eradication action be taken in Fairfax County. This decision was made due to the extent of the infestations and due to the fact that similar eradication attempts in other U.S. states have failed. On July 11, 2008 a federal order

quarantined Fairfax County for Emerald Ash Borer. This means that all interstate movement of ash wood and wood products from Fairfax County is regulated, including all hardwood firewood, nursery stock, green lumber, waste, compost and chips from ash trees. The Virginia Department of Agriculture and Consumer Services has initiated similar quarantines for the counties of Fairfax, Arlington, Loudoun, Fauquier and Prince William and the cities of Falls Church, Fairfax City, Alexandria, Manassas and Manassas Park.

The Forest Pest Program has appointed an urban forester as its Emerald Ash Borer Outreach Coordinator. This staff member will be responsible for educating the public on how to deal with the impending death of many thousands of ash trees. Education will concentrate on how to hire a private contractor to remove dead and dying trees and how to properly apply pesticides that might keep trees alive.

iv. Hemlock woolly Adelgid

Hemlock woolly adelgid is a recent addition to the VDACS list of insects that can be controlled by the Forest Pest Program. This is an insect that infests and eventually kills hemlock trees. Staff is considering various control options for this pest. Staff will propose a control program for this pest in January or February of calendar year 2009 for approval by the Board of Supervisors. Possible control options include pesticide treatments and release of predatory insects that feed on HWA.

d. Tree Commission

In 2007, the commissioners continued to utilize their monthly meetings to research and discuss county tree and landscape issues and policy. Various speakers made presentations to the commission. In addition to participating in numerous public events such as the Fairfax County Earth Day-Arbor Day Celebration and the county's Land Conservation Awards program, commissioners also provided input on various land use and development proposals affecting trees and landscaping. The commission has continued to support and advocate for the passage of legislation dealing with tree preservation and the use of native and desirable landscape trees during development.

e. Tree Preservation Enabling Legislation

In 2007, UFMD continued to support the county's legislative efforts to obtain strong state enabling tree preservation authority. The UFMD worked with land developers, citizens, tree commissions and urban forestry officials from the Virginia Department of Forestry and other Northern Virginia

jurisdictions to build consensus that enabling authority is needed to protect regional vegetation resources. In 2007 UFMD worked within a subcommittee of the Northern Virginia Urban Forest Roundtable to build consensus around the contents of a tree preservation legislative proposal for 2008. NVUFR accepted the need to amend tree replacement provisions of § 15.2-961 and worked to generate language that was acceptable to all Northern Virginia jurisdictions. In addition, in 2007, NVUFR adopted an organizational structure that provided representation for Virginia's building and wood products industries. In 2007, NVUFR made a commitment to work with these groups in order to minimize opposition levels during future Virginia Legislative Assemblies.

Two tree conservation bills (House Bill 1437 and Senate Bill 710) were developed for the 2008 Virginia Legislative Assembly; the bills would authorize Northern Virginia localities within ozone nonattainment areas to enact tree conservation requirements. The language of these bills was developed by a committee that was formed as a result of a conference sponsored by the NVUFR. The committee included Virginia State Senator Patricia Ticer and Virginia State Delegate David Bulova plus representatives of the Northern Virginia Building Industry Association, the Fairfax County Tree Commission, the Virginia Department of Forestry Board, and the Fairfax County Urban Forest Management Division.

Through this coordinated effort, the NVUFR was successful in having tree conservation enabling legislation adopted during the 2008 session, and the legislation was signed into law by Governor Kaine. On October 20, 2008, the Fairfax County Board of Supervisors adopted tree conservation requirements into the County Code. The new tree conservation requirements will be discussed further in next year's Annual Report on the Environment.

f. Map and Analyze the County's Tree Cover

In 2007, due to other board assignments such as development of the 30-year tree canopy goal, UFMD suspended efforts to delineate the distribution of naturally occurring and landscaped vegetation, using the National Vegetation Classification System . However, mapping of forest resources is critical to the management of the county's natural resources, and it is anticipated that UFMD will be able to devote more resources to the mapping effort in 2008 and beyond.

17. Agricultural and Forestal Districts

Landowners may apply to place their land in special Agricultural and Forestal Districts that are taxed at reduced rates. A&F Districts, which are created by the Commonwealth of Virginia, must have 200 or more acres. A&F Districts of local significance, governed by the Fairfax County A&F District ordinance, must have at least 20 acres and must be kept in this status for a minimum of eight years.

Fairfax County's policy is to conserve and protect and to encourage the development and improvement of its important agricultural and forestlands for the production of food and other agricultural and forest products. It is also Fairfax County policy to conserve and protect agricultural and forestlands as valued natural and ecological resources that provide essential open spaces for clean air sheds, watershed protection, wildlife habitat, aesthetic quality, and other environmental purposes. The purpose of the Local Agricultural and Forestal District program is to provide a means by which Fairfax County may protect and enhance agricultural and forest lands of local significance as a viable segment of the Fairfax County economy and as an important economic and environmental resource. All district owners agree to no intensification of the use of their land for the life of the district.

Since the 2007 EQAC Annual Report on the Environment, there has been only one change to the A&F Program. The number of local districts increased from 45 to 46 while the number of state districts remained constant at two. The new district is in the Sully District (28.66 acres).

18. Gunston Cove Ecological Study

Gunston Cove is a tidal freshwater embayment of the Potomac River located approximately 20 miles south of Washington, DC. The cove is formed by the juncture of Pohick Bay and Accotink Bay, through which the waters of Pohick Creek and Accotink Creek flow to the Potomac River.

An ecological study of Gunston Cove, conducted by the Department of Environmental Science and Policy at George Mason University, and supported by the Department of Public Works, continued during 2006. This study is a continuation of work originated in 1984 at the request of the county's Environmental Quality Advisory Council and the Department of Public Works (now the Department of Public Works and Environmental Services). This ongoing monitoring program was established to determine impacts from local point sources and nonpoint sources and to evaluate the status of the Gunston Cove ecosystem. Information from this study is intended to form the basis for well-grounded management strategies for maintenance and improvement of water quality and biotic resources in the tidal Potomac.

The executive summary of the 2006 report by Jones and Kelso summarizes details from their report and covers water quality, phytoplankton biomass, zooplankton, fish larvae and fish, and benthic organisms. The following is extracted from this summary.

Phytoplankton density in the cove indicated a bimodal seasonal plot with a peak in early May and a higher one in early August. The August and September peaks would have been even higher if cells smaller than 1 μm had been included. Both cove peaks in phytoplankton density were due to *Oscillatoria* with *Coelospherium* and *Cyclotella* also important in the August peak. In the river phytoplankton density was more constant through the year with *Oscillatoria* and unknown cyanobacteria being dominant throughout. Biovolume indicated a single peak in the cove in August mainly due to the diatom *Cyclotella*. River biovolume was also dominated by a strong August peak with *Melosira* dominant and *Cyclotella* subdominant.

Rotifers were abundant throughout the year in the cove, with *Keratella* dominant in the spring and *Brachionus*, *Filinia*, and *Polyarthra* most important during the peak densities of mid summer. In the river densities were much lower overall and were dominated by *Brachionus* for most of the year. The small cladoceran *Bosmina* was found in very low numbers in the cove and was only somewhat higher in the river. The larger cladoceran *Diaphanosoma* had two major eruptions in the river and one in the cove when substantial densities were found. *Moina* was also important in 2006 with a major June peak and minor August maximum. *Leptodora* was most common in June and August. Copepod nauplii were very abundant in the river in late June, but declined strongly in early July only to increase again in late July. *Eurytemora* had a moderate peak in the river in June, declined in July and increased again in both areas in September. *Diaptomus* peaked in April and June in both study areas. Cyclopoid copepods were abundant in the river through most of the summer except for early July; in the cove densities were low most of the year, but increased in August and September. In most zooplankton species, the decline of the June peak came in the wake of the high discharges from the June rain events suggesting that flushing may have had an effect on these populations.

In trawls, white perch were most abundant with nearly half of the catch followed by blue catfish, brown bullhead, and bay anchovy. Unusual trawl catches included substantial numbers of young-of-the-year striped bass in late June and early July as well as several young-of-the-year American shad in the cove in September. Both of these events are encouraging in documenting the use of the cove by these two important species.

In the seines, banded killifish were the overwhelming dominants representing over two-thirds of the total catch. Inland silversides, white perch, and striped bass were found in substantial numbers. Banded killifish were even more

dominant (>90 percent of catch) at the two inner cove sites, while more diversity was observed at the near river site.

Data from 2006 generally reinforced the major trends which were reported in previous years. First, phytoplankton algae populations in Gunston Cove have shown a clear pattern of decline since 1989. Accompanying this decline have been more normal levels of pH and dissolved oxygen, increased water clarity, and a virtual cessation of cyanobacteria blooms such as *Microcystis*. The increased water clarity has brought the rebound of SAV which provides increased habitat value for fish and fish food organisms. The SAV also filters nutrients and sediments and itself will inhibit the overgrowth of phytoplankton algae. This trend is undoubtedly the result of phosphorus removal practices at Noman Cole wastewater treatment plant which were initiated in the late 1970's. This lag period of 10-15 years between phosphorus control and phytoplankton decline has been observed in many freshwater systems resulting at least partially from sediment loading to the water column which can continue for a number of years. Gunston Cove is now an internationally recognized case study for ecosystem recovery due to the actions that were taken and the subsequent monitoring to validate the response.

The 22-year record of data from Gunston Cove and the nearby Potomac River is starting to reveal many interesting long-term trends that will aid in the continued management of the watershed and point source inputs. The studies should continue to get a better idea of long-term trends.

C. COMMENTS

1. The Fairfax County Board of Supervisors has endorsed the goals and actions within the Tree Action Plan, adopted a new tree canopy cover goal for the county of 45 percent coverage by the year 2037 and adopted a tree conservation ordinance to strengthen tree preservation policies and procedures. In addition, trees were identified as a special area of interest in the FY 2008 Environmental Improvement Program.

EQAC commends the Board of Supervisors for its progressive approach to improving the retention and expansion of this valuable ecological resource. It is imperative that these programs not be allowed to weaken or be given less priority in future years. EQAC believes that continued emphasis of tree actions in the Environmental Improvement Program document is necessary to assure continued emphasis and eventual meeting of goals.

2. In past Annual Reports, EQAC recommended that the Board of Supervisors emphasize public-private partnerships that use private actions such as purchase of land and easements by existing or new land trusts to protect forests and other

natural resources, including champion/historic trees. With the signing of a Memorandum of Understanding between the Board of Supervisors and the Northern Virginia Conservation Trust, such a public-private partnership came into being. Thus, EQAC's recommendation has been satisfied. EQAC continues to commend the Board of Supervisors for this action and recommends continued support for this partnership.

3. In past Annual Reports, EQAC recommended that the Board of Supervisors develop and implement a countywide Natural Resource Management Plan – an ecological resources management plan that can be implemented through the policy and administrative branches of the county government structure. Two necessary tasks should be accomplished first -- prepare and adopt a unified Natural Resource Conservation Policy, and complete a countywide Baseline Natural Resource Inventory. EQAC notes that slow progress is being made in this area due to efforts by the Fairfax County Park Authority staff in its efforts to establish a natural resources baseline inventory. The FCPA has developed a countywide green infrastructure map that appears to be a basis for a Natural Resource Inventory. Additionally, the Urban Forest Management Division is continuing efforts to devise a countywide map for use as a layer on the county's GIS that will delineate the distribution of naturally occurring and landscaped vegetation. However, these efforts must be supplemented by an inventory of the county that accounts for flora and fauna. The Park Authority has now prepared a Natural Resources Plan for management of the county's parks. EQAC also notes the accomplishment of the Park Authority in preparing and publishing a Natural Resources Plan for management of the county's parks and urges the Park Authority to fully implement this plan. EQAC fully supports these efforts, urging that they culminate in a countywide Resource Management Plan. EQAC's intent is that Fairfax County should have all the tools in place (the policy and the data) to create a plan that will support the active management and conservation of the county's natural resources.

4. In past Annual Reports, EQAC recommended that the Virginia State Code §15.2-961 be amended to include tree preservation requirements. This has now happened. EQAC supports the tree conservation requirements that were adopted in October 2008 pursuant to the new tree conservation authority.

D. RECOMMENDATION

1. The Fairfax County Park Authority approved a Natural Resource Management Plan in 2004. This partially fulfills a long-standing EQAC recommendation to develop and implement a countywide Natural Resource Management Plan. However, most of this plan cannot be implemented without additional staff and funding for the FCPA. While EQAC recognizes and commends the board for funding well over \$1 million towards Environmental Agenda projects that support the goals and objectives in the FCPA's Natural Resource Management Plan over the past three

carryover budget years (FY 2004 thru FY 2006), the FCPA staff estimates that implementation of the plan will require \$3 million plus per year. A more phased approach will allow FCPA to begin to manage 10 percent of parklands and set up the program to be phased in over time. Phase 1 with this approach would require \$650,000 and six positions. EQAC strongly feels that the plan needs to be implemented. Therefore, EQAC recommends that the Board of Supervisors provide funding and some staff positions to implement Phase 1. EQAC recommends that some of the six staff positions should be found from internal FCPA staff assets.

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ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VIII

**WILDLIFE
AND THE
ENVIRONMENT
IN FAIRFAX
COUNTY**

VIII-1. IMPACTS OF DEER IN FAIRFAX COUNTY

A. OVERVIEW

The adverse impacts of white-tailed deer in Fairfax County are readily recognized as a problem by many of its residents. While the "problem" is seen from a variety of perspectives, there is a general consensus that the root cause is "overabundance" of deer in many local areas. There is also a general public perception that a deer management program is needed to address the "problem".

The road to an acceptable deer management solution, however, is not so easily determined. Some of the factors essential to a solution are subject to strenuous debate and attract a wide spectrum of opinion. For example, what is the optimum population level, and if population reduction is required, what means shall be used? The sport hunting community, recreational nature lovers, residential property owners, environmental preservationists and animal rights/welfare groups have differing viewpoints on these issues.

B. BACKGROUND

1. Are Deer Overabundant in Fairfax County?

Caughly (1981) defined four contexts in which the term "overabundance" can be understood when referring to an animal species population. These definitions have since been widely used by most serious scholars in the wildlife management field and by public administrators responsible for wildlife management programs.

1. When the animals threaten human life or livelihood.
2. When the animals depress the density of, or destroy, particular favored species.
3. When the animals are too numerous for their own good.
4. When their numbers cause ecosystem dysfunction.

Where does Fairfax County stand vis-a-vis these four criteria? The available data strongly (even overwhelmingly) suggest that:

1. We experience an unacceptable number of deer-vehicle collisions resulting in deaths, injuries and major property damage. Owners of commercial agricultural and nursery enterprises suffer substantial damage.
2. In many areas of the county, deer routinely leave their enclaves of "natural" habitat to forage in nearby gardens and yards, causing widespread damage to

landscaping and thus major economic loss to property owners. Through voracious browsing, deer are rapidly eradicating numerous threatened and endangered botanical species from the "natural" habitat. In addition, this loss of plant habitat is adversely affecting numerous vertebrate and invertebrate species of smaller physical size, such as many bird species, that are unable to compete with large herbivores.

3. Data for Fairfax County, based on Virginia Department of Game and Inland Fisheries assessments spanning ten years, indicate that its various deer herds showed a single individual in excellent condition, a very few in good condition, most about evenly split between fair and poor condition and a few emaciated individuals. This shows quite clearly that no longer can the available habitats meet the minimum nutritional requirements that would maintain the deer population in sound health. A 125-pound deer requires approximately 6.5 pounds of forage per day, or some 2,370 pounds of vegetation per year.
4. Many of our parklands and stream valleys show severe browse lines, nearly total eradication of understory and loss of numerous species upon which the continuous process of woodland regeneration is dependent. These changes in turn lead to the inevitable loss of a wide variety of animal species. Thus, our remaining natural ecosystem is being severely deformed through the eruption of a single species that has become overdominant in the food chain.

According to each of Caughly's four criteria, it is apparent that Fairfax County has a serious overabundance of deer. In recognition of the public perception of a significant problem, the Board of Supervisors directed county staff to develop a plan for deer management. In October of 1997, county staff contracted with a consulting firm to "study and review existing data on deer, deer-habitat interactions, deer-human conflicts, and deer management proposals within the county." Staff also asked the consultants to recommend suitable methods for addressing the various problem areas. These studies and recommendations were presented in the Consultants Report (Natural Resource Consultants, December 1997). In 1998, the county created a new position and appointed a Wildlife Biologist who had broad experience with Fairfax County parks and parkland issues. In the summer of 1999, the County Executive convened an ad hoc Deer Management Committee of experts and stakeholders to discuss and evaluate the plan drawn up by the staff and the early implementation efforts. The report of this committee and its recommendations were forwarded to the Board of Supervisors in September, 1999 in advance of the season of peak deer problems, which occurs in the fall. The Board of Supervisors approved recommended measures to reduce the deer population to more sustainable and less destructive levels. Since then, the deer management program has made substantial progress in achieving significant population reductions in some of our most threatened parklands.

2. A Description of the Problem

a. Data on Deer Abundance in Fairfax County

To begin this discussion, the terms overabundance and overpopulation should be distinguished. Overabundance refers to population levels that have adverse impacts on the community and other species, while overpopulation refers to population levels of the species that are an imminent danger to itself through disease and starvation. This latter phenomenon is responsible for the population eruption and subsequent collapse of deer herds that has been a topic of scientific study for the past 60 years. While the following information supports a conclusion that deer are overabundant in Fairfax County, neither the data nor experts from a variety of sources have indicated that a level of overpopulation exists, though the relatively poor health of the county’s deer suggest that we may be approaching overpopulation.

Data from the Virginia Department of Game and Inland Fisheries deer density surveys in Fairfax County parks prior to the county’s deer management program showed deer densities from 90-419 deer/sq. mile (Table VIII-1-1).

Table VIII-1-1 Deer Density Baseline Surveys	
Location	Est. Deer/Square Mile
Huntley Meadow Park	90-114
Riverbend Park	213
Meadowlark Gardens Park	90-115
Bull Run Regional Park	419
Fort Belvoir	90
Mason Neck NWR	-

(Source: W. Dan Lovelace, Wildlife Biologist, Virginia Department of Game and Inland Fisheries.)

While the many of the data are limited, taken collectively, the observations of professional park staff, poor health of evaluated deer and high deer densities indicate that deer are overabundant and are negatively impacting the ecology of sizeable areas of Fairfax County. More recent, but fragmentary, data for a number of parks show deer population densities several times larger than maximum carrying capacities. Unfortunately, there are few reliable data available for densities and extent of damage on private lands and the adjacent small islands and corridors of natural habitat. Even though the information available is primarily anecdotal, it is voluminous, and there is a general public perception of a significant and growing problem of deer overabundance.

b. Causes of Overabundance in Urban/Suburban Areas

i. Urbanization/Changes in Habitat

Over recent decades, Fairfax County has transformed from a largely agrarian and woodland area to a multifaceted employment, residential and retail area. Over 1,000,000 people reside in the 395 square miles of the county. Of these 395 square miles, about 140 square miles are wooded and open land and some three square miles are remaining agricultural land. This change from an agrarian area to a developed one has markedly decreased the amount of land usually regarded as suitable for deer habitat and has changed their food sources and movement patterns. This urban/suburban habitat of the county provides a fairly good nutritional base for deer, including manicured lawns, athletic fields, college campuses, golf courses and landscaped residential communities.

Overabundance is particularly common where the course of development has left protected "islands" or "corridors" of deer habitat in or near urban and suburban areas. As the development process reduces the area of natural habitat, deer are forced into these remaining islands and corridors at very high population densities. Because the deer then deplete the forage plants in these enclaves, they venture out into the surrounding developed community in search of food. In such situations, conflicts with humans frequently arise in the form of deer-vehicle collisions and depredations on gardens and ornamental plantings (Flyger et al, 1983; Cypher & Cypher, 1988). Moreover, in such situations, natural predators (e.g., wolves, bobcats, mountain lions) have normally long since been eliminated and hunting is usually prohibited.

ii. Loss of Predators

The precolonial levels of deer in Virginia could be attributed to predation by bobcats, black bears, eastern gray wolves and eastern mountain lions, in addition to the number taken by Native American hunters. While none of these predators depended solely on deer, the deer/predator interactions and the added

effects of hunters kept the population levels low and well within the carrying capacity of the land. Increasing human populations and land development has virtually eliminated wildlife predators from the county. In the first half of this century, hunting had reduced the deer population to very low levels. However in the latter half of this century, with growing human population and reduction of huntable habitats, recreational hunting has almost disappeared in the county. While the number of deer harvested through “Out of Season Kill Permits” has increased in recent years (Table VIII-1-2), the combination of seasonal hunting and out-of-season kill permits does not affect the deer population at sufficient levels to prevent significant deer/human conflicts or ecological damage.

**Table VIII-1-2
Out of Season Kill Permits Issued For Deer Damage in Fairfax County
Virginia Department of Game and Inland Fisheries**

Year	Permits	Number Taken
1989	5	25
1990	3	4
1991	19	41
1992	18	43
1993	42	222
1994	31	131
1995	65	193
1996	165	244
1997	147	310
1998	157	297
1999	216	377
2000	197	263
2001	148	398
2002	187	249
2003	173	311
2004	217	279
2005	191	219
2006	168	258
2007	152	245

(Source: Susan Alger, Matt Knox, Mark Pritt and Jerry Sims, Virginia Department of Game and Inland Fisheries.)

It should be noted that, while the number of out-of-season permits declined markedly in 2001, the number of deer taken increased even more dramatically. A similar pattern occurred in 2003. This is quite consistent with intensification of problems in a smaller number of areas as land clearing for development squeezes the deer population into smaller and more isolated patches of habitat.

c. Problems Created by Overabundance

i. Ecological Impact

Effects of a persistent and overabundant deer population include the loss of biodiversity and a negative effect on ecological and biotic systems. These can be seen in a declining understory (lower height plants and shrubs that serve as a food source for birds) and the appearance of browse lines, which occur when deer eat almost all the vegetation within their reach and the woods develop a “line” at the top of their reach. While few detailed deer/forest impact studies have been performed in the county, in a report to the Animal Services Division, Fairfax County Police Department, the Superintendent of Administration of the Northern Virginia Regional Park Authority noted that “the ever present browse line had now become a common sight in most of our parks. The deer have eaten all of the herbaceous and woody plant growth within their reach. This has eliminated an entire stratum of habitat from the parks.”

The browse line and loss of understory are not the only indications of this ecological impact. There is an abundance of technical literature reporting the effects of a high deer population on plant communities when the lower ecosystem carrying capacity (see page 218) is exceeded. However, the apparent poor health of the county’s deer indicates a level of deer density that reportedly exceeds even the higher biological carrying capacity. There are also numerous studies documenting the negative effects of overabundant deer on wildlife species. For other vertebrates, this may occur through direct competition for food sources or more often by altering the habitat. For example, in some areas of the county, the number of species of birds has markedly diminished through loss of the necessary habitat due to excessive browsing by deer.

As noted in the 1997 Consultant Report and throughout the scientific literature, “the consequences of a persistent, overabundant deer problem can be long-term loss of biodiversity and negative impact to functioning ecological and biotic processes.” We have already begun to see a loss of biodiversity that will ultimately lead to a loss of ecosystem stability, with far more widespread and serious effects than the shorter-term effects of overabundant deer.

ii. Property Loss and Damage (Vehicular, Plantings)

Nationally there are 1.5 million deer-vehicle collisions annually that cause more than \$1 billion in damage and kill several hundred people. The Insurance Institute for Highway Safety ranks Virginia as the state with the seventh largest number of such collisions. The IIHS data shows the average insurance claim for vehicular damage is \$2,600 but with injuries the total average claim rises to \$11,000. The Fairfax County Police Department does an excellent job of analysis of the data on deer-vehicle collisions that require a police presence in their aftermath or that are otherwise reported. The numbers appear to have increased, but the data (Table VIII-1-3) do not show a consistent trend. For those accidents tabulated from January 1998 through 2002, the average damage per vehicle was about \$2,300. Over this same period, the Virginia Department of Transportation picked up 4,507 carcasses of deer killed in vehicular collisions from rights-of-way in the county. In 2002, VDOT picked up 1,057 deer carcasses from the roadway and immediately adjacent right-of-way in Fairfax County, which represents a small increase from earlier years. This increase most likely represents normal variation from year to year.

Police and highway experts estimate that only 20-25 percent of deer impacting vehicles die at the scene (i.e., on the road itself or in the right-of-way); many receive injuries that are soon fatal, but die in the woods or in a nearby yard. Thus, a reasonable estimate would indicate some 18,000-22,500 deer-vehicle collisions in the county during the 1998-2002 period. One can reasonably infer that many, if not most, of these collisions result in property damage to the vehicle. In addition to these crashes which required a police presence, in 2002 there were 1,057 reported deer-vehicle collisions, and in 2003 the number increased to 1,371 reported collisions.

County personnel report an increasing number of complaints of damage to native and ornamental plants in Fairfax County. Referring again to the "Out of Season Kill Permits Issued for Deer Damage" (Table VIII-1-2), an indication is given of homeowner attempts to address property loss primarily thought to be ornamental in nature. Further, although numerous deer management programs are available, such as planting less preferred species and fencing, the effectiveness of these methods declines dramatically with increased deer densities, leading to declining food sources and willingness of deer to eat even undesirable plants. These activities may also tend to increase vehicular incidents, as deer must look farther afield for food sources.

Table VIII-1-3 Deer-Vehicle Collisions in Fairfax County				
Year	Non Injury	Injury Crashes	Fatal Crashes	Total
1993	154	6	0	160
1994	149	10	0	159
1995	127	6	0	133
1996	157	20	0	177
1997	168	17	1	186
1998	144	23	0	167
1999	177	18	1	196
2000	144	17	0	161
2001	143	22	0	165
2002	122	10	0	132
2003	160	19	0	179
2004	122	14	1	137
2005	151	13	1	165
2006	115	14	0	129*
2007	133	19	0	152*

* 41 and 43 percent of these crashes occurred in October and November
 (Source: Report 1993-2001, Michael Uram, Fairfax County Police Department.
 Report 2002-2004, 2006 Earl Hodnett, County Wildlife Biologist.
 Report 2005, Emily Yance-Houser, FCPD.)

iii. Disease

Another problem associated with deer overabundance is the prevalence of Lyme Disease. See Section VIII-4 below in this chapter for a discussion of Lyme Disease.

C. ISSUES IN ADDRESSING THE PROBLEM

To effectively manage the deer population, the implications and interrelationships of population dynamics, carrying capacity, public opinion and methods for management must be understood and incorporated into the program.

1. Understanding Population Dynamics

The concept of population dynamics is crucial to understanding the current problem and the development of a workable solution. There are no simple mathematical models that can be applied to determining the growth of the population of a species in a particular area, and the least complex deer management models and programs based on solely on nutritional deer carrying capacity (see section on carrying capacity below) consider neither the deer population's interactions with the human population nor its interactions with a biodiverse ecosystem.

One important concept to understand is that of home range. Deer show a strong attachment to a home range, and it has been shown that deer forcibly relocated often die of malnutrition even if food is accessible in their new habitats. When natural dispersal from the home range occurs, it is usually the younger males that migrate. This has four implications for Fairfax County deer management:

1. Deer often occupy a home range that can include both a park and the surrounding community or islands and corridors of "natural" habitat plus the yards and gardens of adjacent residential communities.
2. A dramatic decrease in one area will not necessarily result, in the short term, in an increased dispersal of deer from other areas into the depleted area, with a consequent lessening of population density in those other areas.
3. Deer cannot be eliminated from the county under today's conditions, because the deer surviving in surrounding home ranges will, in the long term, undergo natural dispersal and repopulate the depleted areas. This implies that parks and the surrounding areas must be managed as a unit and that solving the problem in one area does not automatically translate to another area.
4. The recent emergence of epizootic hemorrhagic disease, a viral disease fatal to deer but posing no threat to humans, may be a significant factor in natural reduction of the deer population over the next several years. EHD has sometimes been implicated as a significant factor in the boom-bust cycle observed within deer populations that have been the subject of long-term study. Within the past year, 53 deer fatalities due to EHD have been diagnosed in the southeastern portion of the county, and these diagnosed cases probably represent only a small fraction of those succumbing to the disease. Weather, the size and compactness of deer herds and the overall health of the deer play a major role in EHD transmission. Thus, it is not possible to predict the future course of this disease within the county, except to note that it usually takes several years to run its course within a deer population and we appear to be in the early stages of an outbreak.

Other concepts that affect population dynamics include compensatory reproductive responses, survival and predation. Again, it must be noted that deer management is not a simple mathematical equation; it must take into account many biological and behavioral factors, many of which are not fully understood, especially in an environment such as Fairfax County. For example, in many cases, as the size of an animal population decreases, the number of offspring increases, despite the fact that food is becoming less adequate. This phenomenon leads to the population eruption-crash cycles that are widely discussed in the scientific literature. More complete data and an improved understanding of the unique characteristics of Fairfax County must be collected and considered as the management program evolves.

2. Determining Carrying Capacity Goals

Carrying capacity is the level of a population that can be supported by an ecosystem or tolerated by the community. To determine the appropriate population level as a goal for a management plan, it is essential to distinguish among the following:

1. Biological carrying capacity, i.e., a species specific level that is primarily concerned with the population that can be supported with the available nutritional resources
2. Cultural carrying capacity, i.e., a level that is driven by human concerns (the population that can be tolerated by the community at large)
3. Ecosystem carrying capacity, i.e., the population level that can be supported by an ecosystem without disturbance of its stability or reduction of its biodiversity.

The biological carrying capacity is a traditional view that has been widely used by fish and game departments where a primary concern is to maintain adequate stocks of deer for sport hunting, but it does not adequately account for the effects of relatively high population levels on the ecosystem in which the species resides. The cultural carrying capacity is defined by Ellingwood and Spingnesti (1986) as the maximum number of deer that can coexist compatibly with local human communities before conflicting with some human interest. This level is driven by human values, economics and desires independent of ecological considerations. DeCalesta (1998) used the term diversity carrying capacity in a more restrictive sense than ecosystem carrying capacity, but both concepts consider the maximum species population density that does not negatively impact diversity of fauna or flora, including diversity of habitat structure as well as species richness. He contends that deer impacts on biodiversity occur at population densities well below traditional definitions of ecosystem carrying capacity.

Thus, biological carrying capacity is the highest population density and is considerably in excess of cultural carrying capacity (human societal tolerance), which in turn accepts notably higher densities than ecosystem carrying capacity. Finally, diversity carrying capacity has the smallest maximum population density.

3. Considering Public Opinion

Goals for management and methods to use to reach those goals are very different issues; consensus or conflict among groups of constituencies may occur at either or both levels. Goals may vary from a biological carrying capacity level that meets hunting concerns to a much lower carrying capacity level based on an ecological or biodiversity perspective. Cultural carrying capacity may run the gamut of levels, depending on the varying values and tolerances of different constituencies within the community. Even where there is agreement on the level of deer density desired, the methods to reach those goals may be in dispute. Some groups may have a zero-tolerance for lethal means, whereas others may readily support managed hunts or sharpshooters.

As indicated in the 1997 Consultant Report, deer control action by the county should not be undertaken until it is determined that there is sufficient community and political support for it. Again, the need for data, this time in the form of public opinion surveys, is stressed. Additionally, the need to adequately educate the public about the issues is needed to ensure well-informed constituent responses. This is one of the purposes of the extensive tutorial at the beginning of this section ---- to give the general public sufficient information on deer population biology that they can make a well-informed judgment.

D. METHODS FOR DEER POPULATION MANAGEMENT

1. Population Reduction Approaches

a. Let Nature Take its Course - Eruption/Collapse

This approach is based on using no human intervention to affect the deer population one way or the other. This has been studied by wildlife biologists for more than half a century. The findings are that the population goes through an eruptive phase with explosive population growth until it is far above biological carrying capacity. This is followed by eruptions of parasitic and infectious diseases (such as EHD) and by large-scale starvation, which causes the population to crash to perhaps 15-25 percent of its peak level. Thereupon, the herd recovers to begin the cycle anew. Some populations have been followed through five or six successive cycles.

Although the deer population of Fairfax County can be considered to be in the early stages of the eruptive phase, it is well short of a peak. Public concerns about the current and expected future impacts on the community rule this out as an option.

b. Lethal Methods

i. Managed Hunting

Experiences with managed hunts over the past year indicate they have been highly cost effective, in that revenue has exceeded costs for personnel and materials. This is in sharp contrast to their initial use in 1998, when costs were high and relatively few deer were taken. The dramatic upturn in the learning curve is very encouraging. Necessarily, managed hunts are conducted primarily in parkland, and while the amount of deer population reduction in these local areas is no doubt ecologically beneficial, in terms of absolute numbers it has been insufficient to make an immediate noticeable difference in the overall problem.

ii. Archery Hunting

Archery hunting has proven an effective and acceptable means of deer control in residential areas where use of firearms is deemed too hazardous. Archery is a quiet and short-range method, with most deer being taken within less than 100 feet. During the 1998 public hunting season, 789 deer were taken in Fairfax County, of which 597 were taken by archery and the remainder by shotgun. In 1999, archery accounted for 686 of the total of 1,046 deer, and in 2000 accounted for 626 of 1,028 deer. With out-of-season kill permits, archery can be used year-round, even in residential neighborhoods. In 2003, the organized Urban Archery Program harvested 119 deer and an additional 854 were taken with archery equipment by individuals.

iii. Traditional Public Hunting

Under current restrictions outlined by VDGIF, the above figures show that traditional public hunting is not sufficient to address the problem, based on hunters' limited access to deer habitat and preference for antlered deer. Moreover, the habitat that is accessible is not where the major problem areas are located.

iv. Trap and Kill

This method has usually been conducted by darting with anesthetics and dispatching the animal by gunshot or a lethal drug. The former is less effective than sharpshooters while the latter leaves the meat unfit for human

consumption. The use of drop nets and stun guns is explained in the 1997 Consultant Report as a possible lethal method. This method allows for release of non-targeted males and results in meat uncontaminated by drugs but is very cost inefficient.

v. Sharpshooters

The use of professional animal control personnel, police experts, or qualified and experienced volunteers has been proved to be a safe, cost-effective and successful means of management if lethal methods are employed. Earlier experience with this method in Fairfax County has led to significant refinements and greatly improved cost-effectiveness, with a cost per deer taken ranging from \$4.15 to \$22.97. The most recent data indicate a cost of \$29.58 per deer taken. In the 2007-2008 season, 76 does and 43 bucks were taken by sharpshooters, for a total of 119 deer. Once again, the number of deer removed from the population by this method is not sufficient to have more than a modest local effect. However, the sharpshooter program has been so effective in our larger parks that vegetation has begun to recover and the focus can now shift to some of our smaller parks.

vi. Reintroduce Predators

The reintroduction of the usual species of deer predators into an urbanized setting such as Fairfax County is biologically unworkable and publicly unacceptable.

c. Nonlethal Methods

i. Trap and Relocate

Experiments with this approach have been largely unsuccessful due to high initial mortality (up to 85 percent) of the relocated deer. Moreover, there are few locations within a reasonable distance of this area that would accept relocated deer, since most nearby areas have similar problems. The use of drop nets and stun guns is suggested in the 1997 Consultant Report as a possible method for deer capture. More traditional methods use anesthetic darts. This method is considered infeasible for Fairfax County.

ii. Contraception

Steroidal/hormonal contraception has proved very costly and difficult to implement and only very marginally effective. Immunocontraception (where the female's immune system is stimulated so as to prevent fertilization of eggs),

on the other hand, holds some promise for deer management, but it is currently in an experimental stage. The Humane Society of the United States is conducting field studies at the enclosed National Institute of Standards and Technology site in Montgomery County, but due to difficulty with marking deer, the Humane Society is not yet conducting studies for free-ranging deer such as those in Fairfax County. The recent technical literature discusses requirements for sites chosen for pilot tests. All indications are that this is not a near term solution for the county but might hold promise for limiting populations in the future, once they have been reduced to desired levels.

2. Conflict Mitigation Approaches

Conflict mitigation is directed toward reducing the direct impacts of deer on the human population and thereby increasing the tolerance of the community for the existing deer population.

a. Supplemental Feeding

Conceptually, this approach is supposed to divert deer from the landscape plantings in gardens and yards. Supplemental feeding might somewhat improve the health of the existing deer population but would almost certainly drive it to even higher levels. Thus, consideration of this approach would be counterproductive for Fairfax County, since it does nothing to reduce the excess deer population.

b. Fencing

Fencing is only rarely effective, since deer are noted for leaping even eight foot fences. Thus, fencing is a costly and ineffective solution, especially when deer are seeking out preferred plant species.

c. Repellants

In the past repellants have had limited success and are generally costly and most require frequent replenishment. Also, many of them have odors that are no more acceptable to humans than they are to deer. However, repellants containing denatonium benzoate have been used very successfully by commercial tree farms and are now available through retail nurseries. Denatonium benzoate is the bitterest-tasting substance known to science and is usually compounded in a polymer latex emulsion (such as Tree Guard™) which is sprayed on plants and will last for approximately three months and will not wash away in rains. Because it is simply bitter-tasting and not poisonous, it may be safely used on any vegetation not destined for human consumption.

d. Roadside Reflectors

Roadside reflectors divert light from vehicle headlights toward the sides of the roadway and are intended to frighten the deer away from the road, thereby reducing the likelihood of vehicle collisions. The method is potentially most useful in the evening and early morning hours when the majority of deer-vehicle collisions occur. While expensive, this technique has shown some promise in tests. The Virginia Department of Motor Vehicles gave the county a \$40,000 grant to conduct studies of the effectiveness of roadside reflectors. The first test site was a section of Telegraph Road that has had a high incidence of deer-vehicle collisions. The initial results show limited promise but are confounded by three other factors: (1) construction activity in the area may have driven many deer away; (2) a high incidence of epizootic hemorrhagic disease that may have naturally reduced the population; and (3) an archery hunting program at Fort Belvoir that definitely reduced the population in that area. The county staff identified and began testing at additional test sites, but these also had problems that rendered data interpretation extremely difficult.

e. Underpasses

Construction of underpasses has been suggested as a way of providing deer with a safe means of getting to the other side of busy roads. Not only is it exceedingly costly, but there are no data available now or expected in the future that would pinpoint likely sites. Consequently, this approach is regarded as wholly impractical.

f. Use of Less-Favored Plants

Landscaping with plant species that are less favored by deer has been advocated as a way of reducing depredation of yards and gardens. However, as Cypher & Cypher (1988) and numerous other wildlife biologists have shown, when deer populations exhaust the preferred plant species, they readily turn to those less-preferred. Thus, in the short term this approach might seem to work, but longer term experience indicates that it is relatively ineffective.

E. PUBLIC EDUCATION PROGRAM NEEDS

As noted above, an educated public that has an understanding of the population dynamics of deer, the concepts of carrying capacity, the different management options and an understanding of the various values of the community in addressing ongoing management is essential to the successful implementation of a deer management program. The recommended public education program should encompass the following:

- The county Deer Management Web site already serves as a primary vehicle for making much of the information mentioned below more readily available and updatable. See: <http://fairfaxcounty.gov/comm/deer/deermgt.htm>
- Develop pamphlets that are easily read, easily mailed, available through various county offices and through the local Supervisors' offices. These should include information on:
 - Deer and deer biology
 - Ecosystem and population dynamics in general, and as they relate to the interaction between deer and other species of both plants and animals
 - Methods of population management, including their relative feasibility and cost-effectiveness for achieving both short-term and long-term goals
 - The deer management program
 - Permits required for implementation of private control measures
 - Fencing and repellents
 - Safe driving and how to avoid deer on the road
 - Lyme disease and its prevention (See Section VIII-4 of this report)
 - Who to contact for additional information.
- Establish networking among the following agencies for provision of consistent public information:
 - Fairfax County Government offices
 - Fairfax County Supervisors district offices
 - Fairfax County Wildlife Biologist
 - Fairfax County Animal Services Division
 - Nature Centers
 - Health Departments
 - State agencies, particularly Virginia Department of Game and Inland Fisheries and the Virginia Department of Transportation
 - The Humane Society.
- Compile and make available a comprehensive bibliography of literature on deer management in urban environments. (The references attached to this section provide a limited example.) Make this information available to schools, civic and technical groups and interested individuals.
- Establish an archive of evidence documenting how deer can change the characteristics of a landscape. This should show:
 - Habitat characteristics before deer damage
 - Habitat characteristics during and after deer damage
 - Habitat characteristics during regeneration after deer population is reduced

- Statistics and trends for vehicle/deer collisions, number of injuries/fatalities and types of damage.
- Create a visual display of the above for use at schools, fairs, libraries, etc., and develop presentations for use at public meetings and meetings of civic groups.
- Establish a county self service telephone number for wildlife problems and public information. This could be a menu-driven hotline that would direct people to the proper location on the information network or to the appropriate county office.

F. PUBLIC AGENCY RESPONSIBILITY

The Animal Services Division of the Fairfax County Police Department has been assigned primary responsibility for deer management by the Board of Supervisors. However, due to the legal concept that ownership and disposition of wildlife is vested in the state, the Virginia Department of Game and Inland Fisheries exercises significant regulatory and permitting functions that affect Fairfax County's deer management activities. The County Wildlife Biologist and the Animal Services Division, in coordination with applicable land-holding agencies (e.g., Northern Virginia Regional Park Authority, Fairfax County Park Authority) and other public authorities, implements the Integrated Deer Management Plan on public lands. In addition, the County Wildlife Biologist and the Animal Services Division advise private business and residents in addressing deer management on privately owned parcels in Fairfax County. Deer management on federally owned tracts of land within Fairfax County (e.g., Mason Neck National Wildlife Refuge, Fort Belvoir, etc.) is the responsibility of the respective federal agencies and is subject to the applicable federal policies and regulations.

G. PROGRAM IMPLEMENTATION ACTIVITIES

An Integrated Deer Management Plan was developed by county staff subsequent to the Consultant Report received in December, 1997. The Board of Supervisors in November, 1998 directed that program implementation activities commence. Subsequently, in the summer of 1999, the County Executive convened a Deer Management Committee comprised of experts and various stakeholders to evaluate the plan and initial implementation efforts and to prepare recommendations for the Board of Supervisors for further implementation of the plan during the fall and winter of 1999-2000. This committee meets annually to review progress in program implementation and to make recommendations on additional approaches. The County Wildlife Biologist and the Animal Services Division of the Police Department prepare the annual Fairfax County Deer Management Report to the Board of Supervisors that contains extensive data on the

program. The county Web site <http://fairfaxcounty.gov/comm/deer/deermgt.htm> provides additional material.

On December 8, 1997, the Fairfax County Board of Supervisors approved managed hunts for Riverbend Park and the Upper Potomac Regional Park, both in the Dranesville District. Plans by the County Wildlife Biologist and the Animal Services Division were approved by the Northern Virginia Regional Park Authority and the Fairfax County Park Authority for four managed hunts for each of the two locations. The hunts were planned for January and February of 1998. The managed hunts conducted in 1998 were largely unsuccessful in achieving planned program objectives and had associated costs that were difficult to justify. However, some of these costs could be attributed to greater-than-necessary safety measures that experience now indicates would not be needed in the future. In contrast, four managed hunts, involving 132 hunters, conducted in the fall and winter of 1999-2000 were very cost effective, with 195 deer taken at a cost per animal of \$9.51. The seven managed hunts conducted in the fall and winter of 2000-2001 involved 223 hunters, who took a total of 351 deer at a cost per animal of \$17.94. Of the 351 deer taken, 222 were donated to a program that feeds needy families. For 2001-2002 hunt season, the program returned a profit of \$7.28 per animal because the permit fees collected exceeded program costs. This was also true in the 2002-2003 season, with a profit of \$79.60 per animal taken.

The sharpshooter program, which utilizes Police Department Special Operations tactical teams, has been cost-efficient from the outset. These teams must engage in extensive marksmanship training on a regular basis in order to maintain the required proficiency. Instead of practicing on a target range, they are utilizing this required training time in a field setting with the deer more closely resembling operational targets. The harvested deer are collected by a charitable organization that provides meals to the needy. Even in the early part of the learning curve, this program has shown satisfactory harvest rates. Whereas, similar programs in most mid-Atlantic jurisdictions have harvests listed in hours per deer taken, Fairfax County in 2000 had a harvest rate of 1.54 deer per hour. From late December, 1999 through late January, 2000, fourteen sharpshooting sessions over a total of 41 hours were conducted, with a total harvest of 89 deer at a cost of \$4.15 per animal. In the same period of 2000-2001, there were 23 sharpshooter sessions, totaling 94.75 man-hours, which took 146 deer, at a cost per deer taken of \$22.97. In the 2002-2003 season, the sharpshooter program took 248 deer. In 2001, the cost per animal rose to \$44.99 if all costs were attributed solely to the Deer Management Program, but this would be fallacious due to the fact that this activity represents proficiency training for the police tactical units which must be conducted anyway. A major reason for this increase in cost per animal is that most of the sites this year represented repeat visits to locations first addressed last year and the year before. As the herd population density decreases, the time expended on each animal increases, and this is further increased by the increased wariness of the surviving members of the herd. The most recent data indicate a cost of \$29.58 per deer taken. In the 2007-2008 season, 76 does and 43 bucks were taken by sharpshooters, for a total of 119 deer. Thus, the costs are very much in line with expectations and will drop once again as more new sites are brought into future years' mix of new and old locations.

Clearly, the managed hunt and sharpshooter programs must be conducted largely in parkland due to safety considerations, but this is also where some of the most substantial benefits are to be achieved. From the outset, the Northern Virginia Regional Park Authority has taken a position of active involvement and has reaped corresponding benefits. **It is very important that the Northern Virginia Regional Park system continue to be a full participant in these efforts, otherwise the regional parks will act as a reservoir for deer herds that will emerge to adversely impact nearby residential communities and Fairfax County parks.**

The Fairfax County Park Authority has been actively involved and availed itself of the clear benefits offered by the program to the ecology of its parks. The FCPA reported in June, 2003 significant regeneration of the vegetative understory in two of our parks that were among the most overgrazed and have had herd reduction measures used for two successive years. This degree of success is very encouraging, and it is hoped that the FCPA will continue its active involvement in the program and thereby exercise the ecological stewardship that is so necessary to the biotic health of our parks and parkland. By mid-year 2004, the thinning of the herd in several of our larger parks had led to significant regeneration of vegetation so that the emphasis will now shift to smaller parks and those that have not yet had program activities implemented.

Out-of-season kill permits have, for some years, been one of the few legal avenues open to private property owners to permanently remove deer that are causing serious damage to their properties. Such permits are issued by the Virginia Department of Game and Inland Fisheries after verification of the damage. Generally, however, permits are only issued for holders of larger property parcels because of safety considerations. Fairfax County should work in coordination with the VDGIF to make these permits available on a wider basis to qualified residents.

Archery hunting is quite effective in suburban areas since it is much safer than the use of firearms due to the short range of the projectiles. In addition to those residents who have the necessary skills and equipment, there are several commercial firms that offer specialized deer removal services. Last year, 854 deer were harvested using archery equipment. Another 119 deer were taken under the county's Urban Archery Program for a reduction of the county's deer herd by 973 individuals. This year 1,085 deer were taken by archery and an additional 158 in the urban archery program, for a total reduction of 1,243 individuals of the county deer herd. This demonstrates the effectiveness of archery as a tool in meeting program goals and as a method that can be safely employed in even heavily populated areas.

The use of roadside reflectors (strieter-lite technology) that reflect automobile headlights into wooded areas bordering the roadside has been suggested as a method of discouraging deer from crossing roadways in the evening and early morning hours, when most deer-vehicle collisions occur. In mid-November, 1999, the Board of Supervisors approved

\$10,000 for a pilot program to test strieter-lite reflectors in selected locations. In addition, a grant of \$40,000 was received from the Virginia Department of Motor Vehicles for testing and evaluation of this technology at several locations in Fairfax County. Unfortunately, all of the test locations experienced confounding factors such as roadway modification, adjacent development, deer herd reduction through hunting and disease, etc, that made it difficult to draw reliable inferences from the collected data. In addition, the manufacturer of the reflectors has apparently discovered that the initial design was reflecting light in a part of the spectrum to which deer's eyes are relatively insensitive, and the design is now being changed. Such inferences as can be drawn from the data suggest that there is only a slight reduction in deer-vehicle collisions due to the use of reflectors. This conclusion appears to be borne out by tests in other eastern areas where there was an absence of confounding factors. The tests in Fairfax County have shown this technology to have so little promise that it cannot be recommended for continuance.

Even though Fairfax County has not conducted a pilot project to test the feasibility of immunocontraception, this technology has shown a limited potential for the future. A program being conducted by the Humane Society of the United States on the fenced campus of the National Institute of Standards and Technology in Montgomery County is being carefully monitored for possible applicability to Fairfax County. After the deer population has been reduced to generally acceptable levels, this methodology might provide a feasible method of sustaining these levels in some local herds for the long term, but with the important caveat that it appears workable primarily on closed, fenced parcels. In mid-November, 2000, the Board of Supervisors approved \$10,000 to develop a pilot demonstration program on deer contraception, but results of this technology have shown little promise.

H. CONCLUSIONS

The need for a comprehensive deer management program for Fairfax County is not in serious dispute. However, there is perhaps a somewhat wider array of opinion about the appropriate context for determining carrying capacity level for the management program and the particular methodologies to employ in reaching program goals.

As noted in much of the reference literature, deer have traditionally been viewed as livestock and woodlands and meadows as pasture. Deer management models and programs have been based largely upon nutritional deer carrying capacity that does not consider issues of biodiversity, altered natural processes, natural herd demographics and behavior, or adverse impacts on mankind. The discrepancy of views can be seen in comparing a report by the Virginia Department of Game and Inland Fisheries with the Consultant's Report. The VDGIF report states that deer densities ranging from 90-419 deer per square mile have been reported in various county parks and that ideal deer densities are 15-20 deer/sq. mile of suitable habitat. However, the 1997 Consultant Report and much of the scientific literature argues that a deer density of no more than 8-15 deer/sq. mile is

required to meet a biodiversity goal of deer management. Many of the assumptions upon which the Integrated Deer Management Plan for Fairfax County is based require adjustment based on continued environmental assessment of the county and to meet more precisely defined ecological goals.

It is evident that, while deer in Fairfax County have not reached a state of overpopulation (as earlier defined), they are near biological carrying capacity as shown by their poor physical condition and their relentless foraging outside their "natural" habitat. It is equally evident that, for the majority of residents, deer have greatly exceeded cultural carrying capacity in terms of representing a serious vehicular hazard and their depredations on both private landscaping and our public parklands. There is now substantial evidence documenting the fact that ecological and biodiversity carrying capacities have long since been exceeded.

In light of the Environmental Quality Advisory Council's role as an advocate for protection of environmental quality, it is EQAC's view that a biodiversity approach is needed in Fairfax County. However, as cautioned in the 1997 Consultant Report, EQAC too cautions against attempts to move forward with a response without adequate data, a clearly articulated plan and education and consensus building of all major stakeholders. While moving quickly may assuage the concerns of some vocal groups, a true solution must address the problem with a long-term approach, considering all major stakeholders. Management must address an ecological goal that is based on sound science and considers the value system of an educated community.

All of these caveats having been noted, the problem is of such proportions that every feasible approach must be employed not only to keep the burgeoning deer population in check, but more important, to systematically reduce it to sustainable levels. It is evident that the current managed hunt and sharpshooter programs have reached an admirable level of cost-effectiveness but are not reducing the countywide deer population at a rate sufficient to achieve the recommended biodiversity carrying capacity. Thus, it is incumbent upon the Board of Supervisors to continue to take increased and decisive action to address this problem over the long term, while recognizing that it is not going to be possible to please all of the people all of the time. It is likewise essential that the Fairfax County Park Authority continue its active participation in the deer management program in order to exercise the necessary stewardship of the ecological well-being of the county's parkland, which now constitutes nine percent of the land area of the county. The regeneration of parkland where the program has been implemented for several years shows clearly the benefits to be derived and makes it possible to schedule other parks for program activities.

I. COMMENTS

The comments provided below address only the first section of this chapter (deer management issues). Comments and recommendations addressing geese and wildlife borne disease issues are found beginning on pages 244 and 256, respectively.

1. Last year it came to EQAC's attention that there had been a reorganization of the Animal Services Division of the Police Department that has placed the wildlife management program under the County Wildlife Biologist and made it a subordinate unit within the Animal Control Section, which is located within the Patrol Bureau rather than within the Operations Support Bureau. This type of arrangement was not what had been envisioned by EQAC and the Deer Management Committee when the program was implemented in 1999-2000. Rather, the County Wildlife Biologist role was envisioned as somewhat like that of the Environmental Coordinator, i.e., as a function that could interact broadly with a variety of county and outside agencies to address and implement program goals. Major interactions occur with, among others, Fairfax County Park Authority, Northern Virginia Regional Park Authority, Fairfax County Health Department, Virginia Department of Game and Inland Fisheries, Virginia Department of Natural Resources, U.S. National Park Service, U.S. Department of Agriculture, U.S. Fish and Wildlife Service. The only real interaction with the Fairfax County Police Department is with the Special Operations Tactical Team in the Operations Support Bureau. EQAC has concerns that the program functions and personnel may be better located elsewhere in the county structure and at a level consistent with the broad range of required coordinative functions. EQAC, following further investigation, submitted a separate special resolution on this matter to the Board of Supervisors in January 2008. At its September 2008 meeting, EQAC decided that additional investigation was warranted and will be pursued with further recommendations to the Board of Supervisors as appropriate.
2. The addition of an Assistant Wildlife Biologist position to the county staff, as recommended several times by EQAC and approved by the County Executive in mid 2007, is enthusiastically endorsed and should materially enhance the deer management program. However, this position has not yet been filled. This person will have major responsibilities for:
 - Implementation of all necessary measures for reduction of the deer population in order to return the size of the local herds to sustainable levels consistent with the long term carrying capacity of their particular local habitats.
 - Protection, restoration and enhancement of the natural areas and environments that have been subjected to degradation by deer overabundance.
 - Deer management based on a sound ecological approach that emphasizes biodiversity without preferential treatment of particular species.

- Deer management based on an “in perpetuity” perspective that does not trade long-term interests for short-term gains.
- Interfacing with the Fairfax County Park Authority and the Northern Virginia Regional Park Authority on the overall Deer Management Program.
- Serving as an intermediary between private property owners and county and state agencies to address increased attention to the problems of small private (mostly residential) property owners who are suffering serious impacts from deer and develop means for them legally to exercise effective control measures.
- Acting as a spokesperson to: 1) receive ongoing public input into the plan, including surveys of public opinion; 2) serve as the interface with major stakeholders (home owners, environmental preservationists, public safety experts, wildlife biologists, public health experts, sport hunting groups, animal rights groups, etc.) in the continued refinement and implementation of the plan; and 3) articulate program goals and the ongoing management approach to the varied community groups.

J. RECOMMENDATION

1. The authorized Assistant County Wildlife Biologist position should be filled forthwith. This position is critical to implementation of deer herd reduction goals, to attainment of public education program goals and to an appropriate level of networking with other local, state and federal agencies.

ACKNOWLEDGMENTS

EQAC gratefully acknowledges the following individuals and organizations who have generously provided a variety of data and information included in this report and numerous helpful suggestions and recommendations:

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Emily Yance-Houser, Fairfax County Police Department.

Susan Alger, Virginia Department of Game and Inland Fisheries.

Matt Knox, Deer Biologist, Virginia Department of Game and Inland Fisheries.

LIST OF REFERENCES

NOTE: Most of the references listed below contain extensive bibliographies. The two symposia of 1997 contain between them 83 papers, each with its own separate bibliography, which, in the aggregate, offer hundreds of additional references for those wishing more detailed information on a variety of specific topics.

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VIII-2. IMPACTS OF GEESE IN FAIRFAX COUNTY

A. OVERVIEW

Canada geese, once almost exclusively migratory, have to an increasing extent become year-round residents in Fairfax County. Although these resident populations are not evenly distributed throughout the county, many of our ponds and lakes, both large and small, and their adjacent shore areas have been occupied as permanent habitat. Geese have also become an increasing problem on parkland, golf courses and similar facilities. The problem is not so much the animals *per se* but rather the fecal contamination they bring to our water bodies and watercourses and their fouling of grassy open areas. Geese wastes are a well-documented source of fecal coliform bacterial contamination, which has reached alarming levels in many ponds, lakes and reservoirs, even those forming part of our domestic water supply. An additional problem is the damage resident geese cause to our marshes, where they feed on sprouting plants so voraciously that some once plentiful botanical species have all but disappeared. Addressing these problems inevitably requires reducing the goose population, but this is complicated, because geese are protected by federal migratory waterfowl laws.

B. BACKGROUND

1. Origins of the Goose Problem in Fairfax County

In earlier times, the Canada goose was a strictly migratory bird with its nesting range in wilderness areas of Canada and its winter range well to the south of our area. Geese passed through our area twice a year on their migrations. By the late 1960s, some Canada geese had begun to establish resident populations in this region. This is thought to have begun with birds that were propagated to stock local hunting preserves. Since that time, local Canada goose populations have undergone a dramatic upsurge. This increase now includes numerous populations of geese that have become permanent residents in the mid-Atlantic region rather than migrating. These permanent populations have become quite obvious in many parts of Fairfax County. Wildlife biologists estimate that the Canada goose population is increasing at about 15 percent annually, which indicates that problems associated with resident goose populations soon will increase to critical levels unless remedial actions are undertaken.

2. Environmental Impact of Geese

A primary impact of geese is environmental pollution, particularly pollution of streams, ponds and lakes with fecal coliform bacteria from their wastes. The magnitude of the problem is illustrated in two examples below.

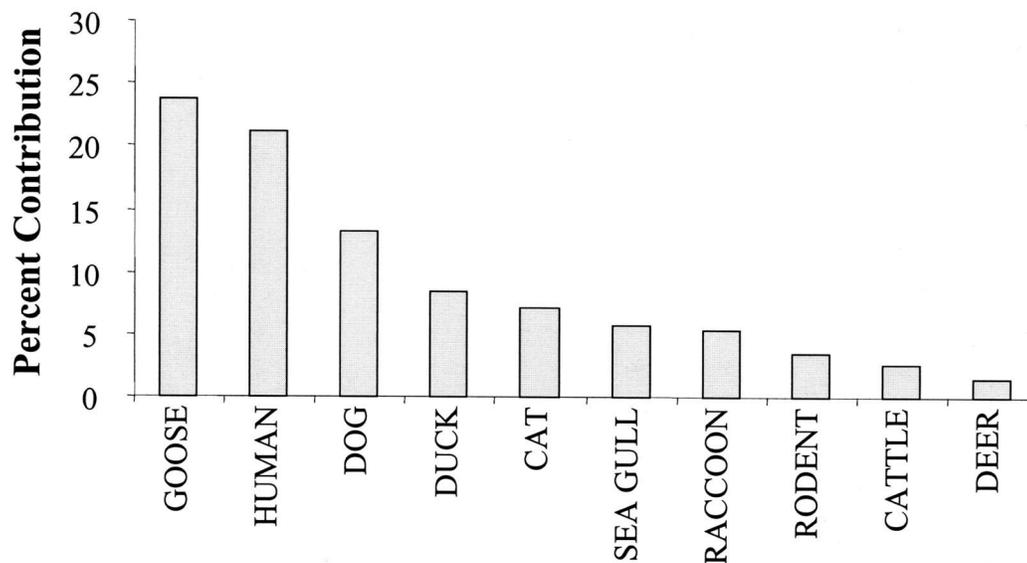
Several years ago, when the Evans Farm property in McLean was in the process of being rezoned for residential development, the farm pond, which was a prominent feature of the site, was extensively sampled to determine if it contained significant levels of pollution. It was known that a resident population of Canada geese was a major contributor to any pollution of the pond. Depending on where the water samples were taken in the pond, the levels of fecal coliform bacteria were found to be from 21 to 27 times those allowable in surface waters in the Commonwealth of Virginia. Drainage from this pond passed through an under-the-road culvert to a much larger pond on the other side of the highway that had two families of resident geese. This pond had fecal coliform counts about three times the allowable level.

More recently, an environmental pollution study was conducted to determine the total maximum daily load of fecal coliform contamination that should be permitted in a portion of Accotink Creek that feeds Lake Accotink. Federal Environmental Protection Agency standards indicated that 98 percent of current levels of pollution should be eliminated, a truly draconian expectation. DNA tests to determine the sources of the extant fecal coliform bacteria pollution revealed that anseriform waterfowl (i.e., geese and ducks) accounted for 32 percent and other wildlife for about 17 percent of the total (see Figure VIII-2-1). With waterfowl being federally protected species and other wildlife largely beyond our control, half of the current pollution load is effectively beyond the power of the county to eliminate in the near term.

Another major impact of resident geese is significant alteration of the ecology of our marshlands. While migratory geese visited marshes on their twice-yearly trips through our region, the stopovers were brief and were timed so that plants had either not yet sprouted or had matured sufficiently that they were not destroyed by feeding activity. However, populations of resident geese are permanent voracious foragers that feed on newly sprouting plants to the point that some plant species are nearly eliminated from the habitat. This is particularly true of plants such as wild rice, which reseed themselves annually and provide food to many animal species. When all of the sprouting plants are consumed before they can mature and produce seeds, there will be no new plants the following year. For example, where wild rice was once an abundant species, many of our marshes are now nearly devoid of it. Thus, because of the ways in which geese change the ecology of marshes they have caused loss not only of key plant species but also of the animal species that are dependent on those plants.

Figure VIII-2-1

Sources of Fecal Coliform Pollution in Accotink Creek



C. ISSUES IN ADDRESSING THE PROBLEM

1. Goose Population Biology

Canada geese are large birds weighing 20-25 pounds, with a life expectancy of some 20 years. Geese mate for life and remain together as pairs year-round. If one of the pair dies or is killed, the other will find a new mate. Mating season is from early February through early April, with nesting season from late March through mid May. Geese begin to nest at three years of age. Eggs are laid approximately one per day until there is an average of five eggs per nest. Incubation (sitting the eggs) does not begin until all eggs have been laid. Eggs not being incubated are cool to the touch. Incubation time is 28-30 days. Normally, all eggs hatch on the same day. Maturation of goslings occurs from early May to early July.

Geese prefer isolated sites near water to nest, with small islands being a favored location. Nests usually are built on the ground in the open, but occasionally are located in brushy or marshy areas if flooding is not a problem. If chased from their accustomed area or if the nesting area has too many pairs, they will find alternative sites, sometimes

farther away from water, sometimes near other ponds in the vicinity, and occasionally on rooftops or other unlikely locations.

Migration is a learned process with which resident geese have not become familiar. Geese return to the general area of their birth to nest, sometimes to the exact site and at least to a nearby pond or lake. Migratory geese nest in Canada while geese nesting in our area are resident geese that were born here. Whereas migratory geese have a flight range of 2,000-3,000 miles, resident geese rarely venture more than 100-200 miles and then only in search of food, water, or safety. Migratory geese do not become resident unless they are injured and can no longer fly for long distances.

Molting season runs from early June to late July. Flight feathers are lost in June and the birds are unable to fly for several weeks, but by early August new flight feathers are fully developed and all birds (except for those injured) are able to fly again. During the molting period, geese need to be near water so they can escape from predators by swimming. They also need an easily accessible food supply during this time.

Natural predators of geese include foxes, raccoons, large owls, snapping turtles and, more recently, coyotes.

2. Considerations of Public Opinion

Many residents find considerable aesthetic reward in having a few geese in areas where they can be observed and feel that the presence of such attractive wildlife creates a pleasant ambience. While this may be true, many others find the fouling of yards, open space and water bodies to be unacceptable, especially where geese congregate in appreciable numbers. Moreover, most of the public is unaware, or at best only dimly aware, of the extent to which geese are major polluters of our ponds, lakes and reservoirs, including some of our water supply sources. As the general public becomes better informed about the pollution aspects of goose populations, greater consensus on remedial approaches should result.

3. Federal Limitations on Remedial Action

Geese, as migratory waterfowl, are protected by federal laws administered by the U.S. Fish and Wildlife Service. Therefore, population reduction by lethal measures applied to adult or juvenile geese is generally not an option. The Fairfax County Park Authority has its own egg addling permit applicable to its parklands. In situations where adult birds are creating an extreme nuisance, the Department of Agriculture Wildlife Service can send staff to round up and relocate them. However, the Fish and Wildlife Service does issue permits for egg addling (including egg oiling) programs as a means of population stabilization. Fairfax County holds such a permit for programs

anywhere in the county under supervision and/or monitoring by the County Wildlife Biologist. Use of trained Border Collies to harass geese into leaving an area is not regulated so long as they do not directly attack or kill the geese.

D. METHODS FOR POPULATION MANAGEMENT

Population management methods that utilize immediate population reduction are not an option due to stringent federal regulations against killing geese once they are hatched. However, the methods outlined below are permissible and accepted approaches to controlling goose populations. Population stabilization coupled with measures that discourage geese from future nesting in an area has proved effective in longer term reductions of population.

1. Population Stabilization

Egg addling and egg oiling are quite effective in preventing eggs from hatching. Strictly speaking, egg addling is vigorous shaking of the egg at a fairly early stage in order to homogenize the contents. This will prevent further development of the egg. Egg oiling coats the surface of the shell with a vegetable oil such as corn oil, which will prevent oxygen from getting to the interior of the egg. This also is effective in halting further development of the egg. Sometimes both methods are referred to as "egg addling." When a clutch of eggs is thus treated, the goose will continue to attempt to incubate them for the normal period, but they will fail to hatch, thus limiting the population to the adult geese already present.

2. Population Exclusion

Most nuisance abatement measures are based on population exclusion. For example, trained Border Collies have been successfully employed to herd geese away from areas where they constitute a nuisance. The geese soon learn to avoid areas patrolled by the dogs, regarding them as unsafe, and they move to other areas where they do not feel threatened. This method of control has been particularly effective in large, relatively open areas such as golf courses. The major negative aspect of this method is the impact on adjacent properties. When the dogs herd the geese off of one property, they necessarily go to the one next door or in the near vicinity. Thus, while one locale is benefited, adjacent locales are afflicted through transference of the problem.

3. Special Foraging Areas

In some cases, an area can be set aside where a small population of geese can be resident without creating an undue nuisance. However, in such cases the aesthetic

appeal of having the geese nearby must be balanced by adequate consideration of the water pollution and other waste problems created.

4. Landscaping Modifications

Altering landscaping can sometimes be an effective tool in discouraging geese from congregating near ponds. Bushy plantings, reeds and tall grasses, strategically placed around a pond, will be perceived by geese as a hiding place for predators, thus discouraging them from using that area.

5. Repellents

There are commercially available, nontoxic chemical repellents that discourage geese from eating grass. The disadvantage to this approach is the necessity for frequent reapplications, since each time the grass is mowed most of the repellent is removed along with the clippings.

6. Prohibition of Feeding

Feeding geese encourages them to become resident and to congregate in areas where a "free lunch" is provided. This exacerbates the very nuisance that one is attempting to reduce. Also, feeding bread and various kitchen scraps is harmful to the geese's health even though they will avidly feed on such items.

7. Combined Approaches

Clearly, combinations of several of the above approaches can be far more effective than their use individually. For example, the use of trained Border Collies together with landscaping modifications can be quite effective in creating an "undesirable" habitat. If egg oiling is added to this for the few nests that may be established, significant reductions in usage of this area in following years can be achieved.

E. PUBLIC EDUCATION PROGRAM NEEDS

Public awareness of both the pollution problems caused by geese and of the mating and nesting cycle of geese is the key to being able to effectively address the "goose problem." At present, insufficient attention has been given by the public media to the pollution aspects of the problem. Since this pollution creates significant public health risks, the problem needs coverage on the county Web site and through informative bulletins to local homeowners associations.

F. PUBLIC AGENCY RESPONSIBILITY

The office of the County Wildlife Biologist within the Animal Services Division of the Fairfax County Police Department has been assigned primary responsibility for management of geese by the Board of Supervisors. However, due to the fact that Canada geese are federally protected waterfowl, the U.S. Fish and Wildlife Service exercises significant regulatory and permitting functions that govern Fairfax County's geese management activities. Fairfax County was the first local jurisdiction in the nation to be granted a master permit for egg addling programs and is thereby authorized to train residents, as individuals or groups, to conduct egg addling under its monitoring and control. Except for federally issued hunting permits, intentional killing of hatched geese by humans is prohibited by federal law. In cases where it is necessary for adult geese or hatchlings to be removed from an area, this activity is conducted by the staff of the U.S. Department of Agriculture - Wildlife Services under permit from the U.S. Fish and Wildlife Service.

The population stabilization (egg oiling) program is highly cost effective since, once trained, all labor intensive activities are performed by local citizen volunteers. The only staff activities required are training, monitoring and reporting under the terms of the federal permit.

G. PROGRAM IMPLEMENTATION ACTIVITIES

Goose management programs have been implemented at a number of locations in Fairfax County. Among the locations and the measures implemented under the Fairfax County permit and monitoring are:

1. Annandale
 - a. Northern Virginia Community College - population stabilization and nuisance abatement, eight years
 - b. Pinecrest Community - population stabilization and nuisance abatement, seven years
 - c. Pinecrest Golf Course - population stabilization and nuisance abatement, seven years
2. Centreville
 - a. Franklin Farms - population stabilization, eight years
 - b. Westfields - population stabilization, seven years
3. Fairfax County
 - a. Lake Barcroft - population stabilization and nuisance abatement, nine years
 - b. Fairfax County Parks - population stabilization, nine years

- c. Copeland Pond - population stabilization and nuisance abatement, eight years
 - d. Brook Hills - population stabilization and nuisance abatement, eight years
 - e. Waters Edge - population stabilization and nuisance abatement, seven years
4. Oakton
- a. Fox Lake - population stabilization, seven years
5. Reston
- a. Reston Community - population stabilization, eight years
6. Vienna
- a. Trinity School - population stabilization, eight years
 - b. Champion Lake - population stabilization, seven years

All of these programs have demonstrated reasonable degrees of success in stabilizing populations. In some cases, populations have actually declined over time due to efforts to discourage geese from further attempts to nest there.

In 2002, there were 275 eggs addled under the county permit and approximately 1,200 under the separate Fairfax County Park Authority permit. In 2003, there were 255 eggs addled at 61 nest sites under the county permit and 674 eggs at 123 nest sites under the FCPA permit. In 2004, due to staffing limitations, there were ten eggs from two nests addled under the county permit and 1,403 eggs from 243 nests under the Park Authority Permit. In 2005 there were 1,403 eggs addled from 243 nests under the FCPA, but none under the county permit, again due to staff limitations. In 2006 the FCPA program addled 509 eggs in 109 nests and the county program addled 299 eggs. In 2007 the FCPA program addled 451 eggs in 115 nests and the county program addled 246 eggs in 49 nests.

H. CONCLUSIONS

While geese in small numbers are regarded by many as a pleasant addition to the local ambience, large resident goose populations in many areas of the county constitute a major environmental nuisance and public health risk. Resident goose populations tend to congregate near ponds, lakes and slow-flowing streams, which leads to contamination of these water bodies with high levels of fecal coliform bacteria. In addition, they foul the grassy open areas in the vicinity with their feces. The high growth rate of the resident goose population and the limitations on methods of control have raised pollution to levels that are not only environmentally unacceptable but that now constitute a significant public health concern.

While the programs currently in place to address these problems are good, they need to be replicated much more widely in additional areas of the county. Moreover, more intensive public information campaigns and community outreach efforts are badly needed to actively involve a larger number of individuals and community organizations in population control programs. The office of the County Wildlife Biologist is not adequately staffed to conduct and/or supervise these critical functions. This staffing limitation is very unfortunate, since geese are a major contributor to pollution of the streams and water bodies that are sources of drinking water and are used for recreational purposes and the county is facing increased restrictions in the Total Maximum Daily Load of pollutants that may be present in our surface waters.

I. RECOMMENDATION

The recommendation provided below address only the second section of this chapter (geese management issues). Comments addressing deer management and wildlife borne disease issues are found beginning on pages 232 and 256, respectively.

1. EQAC strongly recommends additional staffing at the earliest budgetarily feasible time for this program in the form of one full-time equivalent Assistant Wildlife Biologist to undertake:
 - Revitalization and supervision of the program on county sites.
 - Replication of the existing program in additional areas of the county by training additional residents and homeowner groups in goose population stabilization methodology.
 - Enhanced public education outreach to sensitize all Fairfax County residents and owners of nonresidential properties to the pollution problems caused by geese and the programs available for addressing them.
 - Assess the role excessive goose populations play in destruction of our marshland and wetland habitats.
 - Coordination with the Department of Health in monitoring pollution of the county's ponds, lakes, streams and grassland habitats.

ACKNOWLEDGMENTS

EQAC gratefully acknowledges the following individuals who have provided data and information included in this report:

Earl Hodnett, Wildlife Biologist, Animal Services Division, Fairfax County Police Department.

Charles Smith, Resources Management Division, Fairfax County Park Authority.

VIII-3. COYOTES IN FAIRFAX COUNTY

A. OVERVIEW

There have recently been a growing number of reports of coyotes in the Washington metropolitan area, particularly in the western portions. They have begun to invade habitats such as Rock Creek Park, and there have been sightings in Falls Church. Contrary to some public perceptions of coyotes as vicious predators without redeeming features, there are distinct pluses as well as minuses to having them around.

B. BACKGROUND

Biologically, the coyote, *Canis latrans*, is another member of the dog and wolf family. The historical range of the coyote was from the western foothills of the Rocky Mountains to the Mississippi River. In the 1880s they began to spread west and today are endemic to the Pacific shores. In the early 1900s they began to spread eastward and during the last 15 years or so have become established in the mid-Atlantic region. They adapt quite readily to urban and suburban environments as long as there are small semi-secluded habitats from which they can venture forth to hunt and forage. Once they enter an area that meets their habitat requirements they rapidly become endemic and are not easily dislodged.

Coyotes most often hunt and forage as solitary individuals or sometimes as pairs, rarely as packs of several adult animals together. An exception occurs in the case of a female with young pups who are being taught to forage or are led on treks to obtain food from human sources such as improperly stored trash and garbage.

The usual food of coyotes is rodents and other small varmints. Adult coyotes will sometimes prey on small deer fawns but do not attack adult deer because of their size. Occasionally coyotes will opportunistically attack small domestic pets, but this most often occurs when they are foraging for improperly stored garbage and outdoor pet feed dishes around human habitations.

C. ADDRESSING THE PROBLEM

The only action required at this time is monitoring the spread of the coyote population and any adverse incidents that may occur.

D. PUBLIC EDUCATION PROGRAM NEEDS

The public should be kept informed about when and where to expect to see coyotes. While coyotes will sometimes prey on small pets, e.g., cats and small dogs and the public needs to be kept informed on measures to prevent this, the public also needs to develop awareness of the beneficial aspects of coyotes in controlling populations of small rodents and excessive numbers of small deer fawns. Coyotes can also play a beneficial role in controlling populations of Canada geese.

E. PUBLIC AGENCY RESPONSIBILITY

The County Wildlife Biologist has the primary responsibility for monitoring the coyote population and addressing public education needs. The Animal Control Division of the Fairfax County Police Department is responsible for impounding animals that are behaving strangely and may be infected with rabies. The Health Department monitors cases where humans have been bitten or scratched.

F. PROGRAM IMPLEMENTATION ACTIVITIES

No program activities are envisioned at this time except for monitoring and public education activities by the County Wildlife Biologist.

G. CONCLUSIONS

Coyotes have become established in parts of Fairfax County and will spread and become endemic over time. The public needs to develop an understanding of the occasional risks to small pets but also needs to be educated about the beneficial control of a variety of rodents and other varmints that coyotes provide. They may be of particular benefit in controlling the goose population since they are a natural predator not subject to the restrictions of the Federal Migratory Waterfowl Act.

H. COMMENT

There are no recommendations at this time except that the County Wildlife Biologist should monitor the situation and keep the relevant county agencies and the public informed.

VIII-4. WILDLIFE BORNE DISEASES OF CONCERN IN FAIRFAX COUNTY

A. OVERVIEW

There are a number of zoonotic diseases (those in which wildlife serves as a reservoir) that affect humans. Four such diseases of greatest concern in Fairfax County are West Nile Virus, Lyme Disease, Rabies and the complex of diseases caused by fecal coliform bacteria. The causative agents, modes of transmission and means of prevention are briefly discussed below. A new initiative, the Disease Carrying Insects Program, has been undertaken by the Fairfax County Health Department. The reader is referred to their report on West Nile Virus and the Pilot Tick Surveillance Program for additional details in these areas.

B. BACKGROUND

1. West Nile Virus

West Nile Virus is transmitted to humans and other warm-blooded animals by mosquitoes that have fed on birds infected with the virus. Crows have been particularly implicated as a reservoir species, but it is known that many other bird species are also involved. Mosquitoes are intermediate carriers that convey the virus from birds to humans. There have also been several cases in Fairfax County of horses being infected. The principal intermediate carrier is *Culex pipiens*, the common house mosquito. There is currently no evidence for person-to-person transmission (except in the unusual situation of organ transplants or blood transfusions from infected donors). Some people infected with West Nile Virus apparently experience few, if any, symptoms. Others have mild flu-like symptoms such as low-grade fever, head and body aches, skin rash or swollen lymph nodes. In a few cases such as the elderly, children and those with weakened immune systems, the infection may cause encephalitis (inflammation of the brain), meningitis (inflammation of the brain covering) or, occasionally, death. Encephalitis and meningitis symptoms include rapid onset of high fever, severe headache, stiff neck, muscle weakness and coma. The virus is of recent occurrence in this country, having been first identified in New York in 1999. However, it has now spread to every state in the lower 48. The Centers for Disease Control and Prevention of the U.S. Public Health Service predicts that the west coast will be particularly hard hit next year because the disease has recently appeared there, and the usual pattern is an eruption of cases the year or two following first appearance. By the end of 2002, CDC had confirmed 161 cases, including 18 deaths, since 1999. For the year 2003, these figures had jumped to 4,156 reported cases and

284 deaths. This major outbreaks in early 2003 resulted in 2,000 cases in Colorado, 1,000 in Nebraska and 800 in South Dakota. The CDC figures on reported cases show a rapidly increasing incidence. There is almost certainly major underreporting of incidence, since most of those infected apparently have mild symptoms that do not require a visit to the doctor, and even for those actually infected and seeing a physician, the symptoms may be insufficient to trigger a report without confirmation by serologic tests.

a. Preventive Measures

i. Mosquito Habitat Elimination

An important preventive measure to reduce the chance of infection with West Nile Virus is to eliminate, wherever possible, standing water that provides a breeding habitat for mosquitoes. Any containers such as cans, pails, wheelbarrows, etc., should be emptied and stored in such fashion that water will not collect in them. Bird baths and similar containers should have the water changed every two or three days. Ponds can be stocked with the small fish *Gambusia* that feed on mosquito larvae. There are two species: *Gambusia affinis* and *G. holbrooki*. Both are highly effective in keeping ponds and lakes free of mosquito larvae. *Gambusia affinis*, the most common species, has become endemic in many areas of Eastern Virginia and can be readily transplanted from one pond to another.

ii. Insect Repellents

Since it is nearly impossible to completely eliminate the presence of mosquitoes, some of the most effective preventive measures available for mosquito-borne infections such as West Nile Virus and tick-borne Lyme disease are sprays or lotions containing DEET (N,N-diethyl-meta-toluamide). The active ingredient, DEET, was developed by the U.S. Department of Agriculture in 1946, originally for use by the military. The most convenient method of application to the exposed skin is as an aerosol spray. A recent study reported in the *New England Journal of Medicine* showed that the higher the concentration of DEET in the spray, the longer lasting the protection. In the case of mosquitoes, products containing 20 percent DEET were effective for four hours, those with 25 percent DEET were effective for five hours, and those with 35 percent DEET were effective overnight. It is estimated that there have been more than eight billion applications of DEET over the past 50 years with an excellent safety record. However, a study of DEET by pharmacologists at Duke University, reported in the November 2001 issue of the *Journal of Experimental Neurology*, indicated that frequent and prolonged DEET exposure might cause adverse neurological effects. It was recommended that use be

limited to preparations containing no more than 30 percent DEET for adults and lower concentrations for children.

2. Lyme Disease

Lyme Disease, caused by the bacterial spirochete *Borrelia burgdorferi*, is transmitted to humans primarily, if not exclusively, by *Ixodes scapularis*, the common deer tick. Deer ticks are dark brown to black and about the size and shape of a sesame seed. The white-tailed deer appears to be the primary reservoir, but rodents have also been implicated. Lyme Disease was first identified in Lyme, Connecticut, in the mid-1970s when a group of children developed arthritis-like symptoms. Within a few days to several weeks of receiving an infected tick bite, most victims will have a red, slowly expanding "bull's-eye" rash (red in the center, pink at the periphery) and such symptoms as malaise, fever, headache and muscle and joint aches. The longer a case of Lyme Disease persists without treatment, the more severe, debilitating and long lasting the symptoms are likely to be, such as arthritis and neurologic abnormalities. Many of the physicians treating Lyme Disease have found three or four week courses of doxycycline or amoxicillin to be effective treatments for early stages of the disease, but later stages may require intravenous antibiotics for a month or more.

Confirmed cases of Lyme Disease underwent a sharp increase through June, 1997 (Table VIII-4-1). The decrease of the next two years may be attributable to greater public awareness of the threat represented by deer ticks and greater use of proper preventive measures when hiking and working in wooded areas. It is unclear, however, whether a decrease in deer population will lead to a corresponding decrease in Lyme Disease cases, since other animals can act as reservoir species and may inhabit areas within which deer populations decline. However, it is interesting to note that neighboring, semi-rural Loudoun County, which has a large deer population, has the highest per capita incidence of Lyme Disease cases reported in the commonwealth. In 2001, there were 65 cases compared with 29 cases in 1999, according to the Loudoun County Health Department. This suggests a strong upward trend in incidence where there are large populations of white-tailed deer.

a. Preventive Measures

i. Vaccine

In our Annual Report for 1999, we noted that a new vaccine (Lymrix) for the prevention of Lyme Disease had just been released. In our Annual Report for 2000, we noted that there had been adverse reactions to the vaccine and advised consultation with your personal physician about the advisability of being vaccinated. As a result of an increasing number of adverse reactions, this vaccine was subsequently withdrawn from the market. While it is true that vaccination of those persons intensively exposed to deer ticks might have been

helpful, for the vast majority of the population, consistent use of ordinary preventive measures should be entirely adequate. When engaged in activities that might result in exposure to deer ticks, proper clothing is a must, preferably long pants tucked into boot tops or spraying the lower legs, trouser bottoms and sock tops with insect repellent, since most ticks are encountered close to the ground.

Table VIII-4-1 Reported Lyme Disease Cases Meeting Centers for Disease Control Case Definition Program Fairfax County		
Period Covered	Reported Cases	Contracted outside of Fairfax County
July 1994-June 1995	14	Not Available
July 1995-June 1996	22	Not Available
July 1996-June 1997	31	Not Available
July 1997-June 1998	16	8
July 1998-June 1999	13	9
July 1999-June 2000	50	8
July 2000-June 2001	51	9
July 2001-June 2002	61	33
July 2002-June 2003	87	Not Available
July 2003-June 2004	109	Not Available
****	***	****
January-December 2006	102	Not Available
January-October 2007	158	Not Available

**** The reporting period and methodology changed during this time.
 (Source: Fairfax County Department of Health)

ii. Insect repellent

The same DEET-containing repellents recommended for mosquitoes (see West Nile Virus above) are also highly effective for ticks. See the discussion of DEET-containing insect repellents in the West Nile Virus section above.

3. Rabies

Rabies is a viral disease that affects the nervous system and may have a post-infection latent period from a number of days to several weeks. During the latent period, between the time of an animal bite and the onset of overt symptoms, the virus is propagated along the nerve fiber sheaths until it reaches critical areas of the brain. While rabies has been present in this area for many years, it exists at a low level with the incidence appearing to cycle over a period of several years. This is attributed to the fact that infection, when it reaches the symptomatic stage, is uniformly fatal. Thus, an infected animal may infect several others and there will appear to be a relatively high incidence, but when those animals die there are fewer carriers for a period of time during which the incidence appears to be lower. We are currently experiencing a periodic upturn in the rabies cycle, particularly among foxes and raccoons. Rabies is transmitted to humans and other mammals through the saliva of an infected animal almost always in the overtly symptomatic stage, which usually only lasts about ten days. During this time, an infected animal usually exhibits aberrant behavior, such as a nocturnal animal being around during the day, exhibiting signs of confusion, showing an unsteady gait, desperately seeking water but unable to drink, often aggressively approaching dogs and humans, etc. The main wildlife reservoirs in this area (and the number of cases in 2002) are raccoons (52), foxes (9), skunks (9) and, to a lesser extent, some bats. Cases from July 1, 2004, to June 30, 2005, were raccoons (29), foxes (13), skunks (5), bats (6) and groundhogs (1). Domestic animals, e.g., dogs and occasionally cats, may act as secondary transmitters of the disease after having contracted it from a wildlife source. The incidence of rabies in animals fluctuates; for example, Fairfax County had 80 cases in 2002, 47 cases in 2003 and has had 52 cases by the end of July in 2004 and 54 cases by the end of June in 2005. In CY 2004 612 animals were tested with 69 testing positive, and through October 2005, 35 of the 480 animals tested were positive.

a. Preventive measures

The most important measure for prevention of rabies is to avoid being bitten by or direct contact with an animal that might be infected. If you encounter an animal that is behaving strangely or exhibiting symptoms such as excessive drooling, contact Fairfax County Animal Services Division at **703-830-3310** without delay. This also applies if you find a dead animal that you suspect may have died of rabies. Animal Services will send a professionally trained officer to impound the animal (or carcass) for quarantine and testing. If you are bitten or scratched or come

in contact with the animal's saliva, seek immediate medical attention so a determination can be made as to whether you may require a course of preventive inoculations. The protective serum used for such inoculations has been substantially improved in recent years so that fewer doses are required, and those have fewer unpleasant side effects.

4. Fecal Coliform Bacterial Diseases

Fecal coliform bacterial diseases in humans are caused primarily through ingesting or wading or swimming in contaminated water. There are a number of bacteria that can be responsible, but the thing they share in common is being present in the gut and intestinal wastes of a variety of wildlife and domestic animals. The relatively new science of molecular genetic DNA testing has made it possible to reliably identify the particular animals responsible for the pollution of a given water sample. Studies carried out at several sites in Fairfax County indicate that Canada geese living in and about ponds and streams are principal contributors, while ducks, deer, raccoons, foxes and domestic dogs and cats are also significant sources (see Figure VIII-2-1 on page 235). When the wastes from these animal sources are deposited directly into, or washed into, streams and ponds, the pollution can build up to hazardous levels. For example, one pond in the McLean area, inhabited by Canada geese that had become resident, was extensively tested several years ago and was found to have levels of fecal coliform bacterial contamination that ranged from 21 to 27 times the level allowable in surface waters in the Commonwealth of Virginia. Another occasional source of such contamination is from leaks, overflows, or ruptures in the public sanitary sewer system or private septic systems. While illness from such bacteria is usually not life threatening and is readily treated with antibiotics, exposure to waters that one has reason to believe may be polluted should be scrupulously avoided.

Several years ago, budgetary limitations led to consideration of eliminating the county's Stream Monitoring Program. EQAC intervened in the discussion, pointing out that this monitoring was environmentally critical and not duplicated in any other county programs. As a result, the Board of Supervisors directed that the program be continued. Recently, an agreement has been reached in which the Stream Monitoring Program for bacterial contamination is being reorganized. The collection of samples will now be handled by staff of the Department of Public Works and Environmental Services responsible for the watershed management program, since they are in the field on a regular basis and it is efficient for them to perform this function. Analysis of the samples will continue to be performed by the Department of Health laboratories. It is felt that this arrangement will provide for better and more efficient monitoring of the health and safety of our streams, lakes and ponds.

a. Preventive measures

There is a general solution to this problem in which pollution of our surface waters is prevented in the first place. The main individual solution to the problem is to avoid disease caused by fecal coliform bacteria by not drinking water from sources whose pollution status is unknown and by not wading or swimming in water that is known to be, or suspected of being, polluted.

C. PUBLIC EDUCATION PROGRAM NEEDS

The Fairfax County Department of Health has available an excellent booklet entitled *Preventing Tick-borne Diseases in Virginia*. They also have a brochure entitled *Rabies and Animal Bites: What you should know and what you should do*. Additional information is available through the Health Department section of the county Web site <http://fairfaxcounty.gov/living/healthhuman/health.htm#environmental>

With the recent nearly epidemic explosion of West Nile Virus, there is near certainty of it becoming endemic in our area for the long term. Public education materials, comparable to those noted above, are available from our own county Health Department, especially at <http://www.fairfaxcounty.gov/fightthebite>. In addition, the Centers for Disease Control and Prevention of the U.S. Public Health Service has some recently-developed materials that are quite good. A new initiative, the Disease Carrying Insects Program, has been undertaken by the Fairfax County Health Department. The reader is referred to their report on West Nile Virus and the Pilot Tick Surveillance Program for additional details in these areas.

Because of the frequently changing levels of pollution in our surface waters, it is not practical to create printed materials identifying those streams and ponds that are affected by fecal coliform bacterial pollution. However, our excellent county Web site is an ideal way for the public to receive frequent updates on results of the Stream Monitoring Program and notices about waters that should be avoided due to pollution.

The public media generally do a fairly good job of reporting the finding of rabid animals. Such incidents could also be posted on the county Web site as advisories.

D. PUBLIC AGENCY RESPONSIBILITIES

The primary public agency responsibilities lie in the following areas:

1. Public education
2. Monitoring of disease incidence
3. Monitoring of pollution and exposure hazards
4. Providing animal control services
5. Providing mosquito abatement, where needed.

The Animal Services Division of the Fairfax County Police Department is responsible for animal control activities, such as impounding animals suspected of being rabid and similar wildlife-related activities. The Stormwater Planning Division of the Department of Public Works and Environmental Services will have responsibility for collection of water samples from streams, lakes and ponds. The Health Department has responsibility for most prevention and public education activities, water sample testing and various monitoring and information gathering programs.

E. HEALTH DEPARTMENT REFERENCE MATERIALS

The Fairfax County Health Department has prepared several excellent brochures to provide information to the public on various animal and insect borne diseases and means for their prevention.

- Ticks and tick-borne diseases in Fairfax County
- Understanding mosquitos and West Nile Virus
- The Asian Tiger Mosquito
- Choosing the right repellent
- Rabies and Animal Bites: What you should know and what you should do

The Health Department Web site, www.fairfaxcounty.gov/living/healthhuman/, has additional information in the section entitled Health.

- Lyme Disease
- Mosquitos
- Rabies
- Environmental health contains information sections on
 - Malaria
 - Mosquitos
 - Rabies
 - The Stream Protection Strategy Program contains information on fecal coliform pollution

F. CONCLUSIONS

The upsurge of West Nile Virus and Lyme Disease require continual monitoring and public education and are rapidly becoming serious public health issues. Rabies is a continuing low level, more or less steady-state, problem. Waters polluted by excessive levels of fecal coliform bacteria require mitigation, where possible, and monitoring and posting to warn the public against exposure. Malaria, of which a very few scattered cases have been reported, will require careful monitoring and epidemiologic tracking as well as mosquito abatement.

G. COMMENTS

The comments provided below address only the fourth section of this chapter (Wildlife Borne Diseases of Concern in Fairfax County). Comments and recommendations addressing deer management and geese issues are found beginning on pages 232 and 244, respectively.

1. EQAC commends the Board of Supervisors for providing continued active support to the following ongoing programs:
 - The Stream Monitoring Program in which the Stream Protection Strategies Program of the DPWES performs sample collection and field testing and the Health Department performs laboratory testing and analysis functions.
 - Enhanced public education programs and initiatives in key areas, such as control of rabies and of wildlife contributing to pollution of surface waters, epidemiology and abatement of insect borne diseases such as West Nile Virus and Lyme Disease.
 - EQAC commends the Health Department for its excellent public education programs and advocates posting of advisories on the county website when polluted waters are identified.
2. EQAC feels that the Board of Supervisors should monitor these programs by scheduling periodic reports to its Environment Committee by county staff.

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Harriet Calloway, R.N., (now retired) Epidemiologist, Fairfax County Health Department.

Laura Suzuki, R.N., MPH, Fairfax County Health Department.

John Ruthinoski, Fairfax County Health Department.

Jorge Arias, PhD., Fairfax County Health Department..

WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY: SUMMARY OF RECOMMENDATIONS

Impacts of Deer in Fairfax County

1. The authorized Assistant County Wildlife Biologist position should be filled forthwith. This position is critical to implementation of deer herd reduction goals, to attainment of public education program goals and to an appropriate level of networking with other local, state and federal agencies.

Impacts of Geese in Fairfax County

1. EQAC strongly recommends additional staffing at the earliest budgetarily feasible time for this program in the form of one full-time equivalent Assistant Wildlife Biologist to undertake:
 - Revitalization and supervision of the program on county sites.
 - Replication of the existing program in additional areas of the county by training additional residents and homeowner groups in goose population stabilization methodology.
 - Enhanced public education outreach to sensitize all Fairfax County residents and owners of nonresidential properties to the pollution problems caused by geese and the programs available for addressing them.
 - Assess the role excessive goose populations play in destruction of our marshland and wetland habitats.
 - Coordination with the Department of Health in monitoring pollution of the county's ponds, lakes, streams and grassland habitats.

Coyotes in Fairfax County

There are no recommendations at this time except to have the County Wildlife Biologist monitor the situation and keep the relevant county agencies and the public informed.

Wildlife Borne Diseases of Concern in Fairfax County

There are no recommendations at this time, although EQAC has provided comments in this section recommending active support to a number of ongoing programs and to the monitoring of these programs and reporting to the Board of Supervisors' Environmental Committee.

ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER IX

**NOISE, LIGHT
POLLUTION AND
VISUAL POLLUTION**

IX-1. NOISE

A. OVERVIEW

Noise is often considered to be unwanted sound. Sound becomes undesirable when its intensity is such that it interferes with one's ability to hear something more desirable or when there is a desire to not hear anything at all (i.e., “silence is golden”).

Noise is a byproduct of our everyday lives. Residents hear various noises and determine if the noise intensity is such that their quality of life is impacted—it’s often “in the ears of the beholder.” Noise that is perceived as a detriment to our quality of life due to its intensity, timing, duration and/or its source is defined as noise pollution.

Key elements of determining noise pollution are the measured intensity of noise, its duration and how these impact society as a whole. Noise is a major concern of our society, especially in urban areas. How it is regulated is based on scientific findings and not solely on human perception. Noise is measured by scientific instruments that receive the sound and determine its location and intensity as it radiates from the source. The resulting intensity levels and locations will allow for noise levels to be catalogued so noise can be regulated when society objects to noise pollution.

In a world of constant natural and manmade sounds, those that are perceived as “noise” vary among people in the community. The pivotal issue is the perceived impact or degree of annoyance from noise. To some, loud sounds coming from an airport are the sounds of the economy working and growing, while others feel that this noise deprives them of their privacy and quiet. People can be startled by unexpected noise and usually do not understand why the generation of such noise is necessary.

Recent studies suggest a growing intolerance among residents and communities for noise associated with airports, traffic, construction and athletic events, etc. The impacts of noise on a community include:

- Diminished privacy and quiet at home or at an outdoor recreation experience, vacation or rest site (private cabin at the lake, river or beach)
- Interrupted sleep
- Interrupted entertainment and conversation
- Interruptions at work or school
- Property damage such as broken windows

In response to an EQAC recommendation for the development and distribution of educational materials to the public regarding noise issues, county staff has established a Web site containing information and links addressing noise issues. The Web site is available at <http://www.fairfaxcounty.gov/dpz/environment/noise/> .

In the next sections of this report some key noise pollution concerns will be addressed, followed by recommendations to alleviate their impacts.

B. AIRPORT NOISE

1. Operations and Associated Noise Impacts at Ronald Reagan Washington National Airport and Washington Dulles International Airport

Fairfax County is served by Ronald Reagan Washington National Airport and Washington Dulles International Airport. According to the Metropolitan Washington Airports Authority's Web site, in 2007, 43.4 million passengers traveled through Ronald Reagan Washington National Airport (National) and Washington Dulles International Airport (Dulles) on roughly 660,000 flights. The number of flight operations and passengers at Dulles Airport increased from 2006 but was still considerably lower than 2005 due to the cessation of operations by Independence Air. While the number of flight operations at National Airport in 2007 was slightly lower than the number of operations in 2006, the airport set a record in terms of passenger service, with an 0.7 percent increase from 2006 and a 4.7% increase from 2005, the previous record years.

On a typical day, over 4,000 airplanes will fly in the skies over the Washington region. Most of these flights are to and from Ronald Reagan Washington National Airport, Washington Dulles International Airport, Baltimore-Washington International Airport or Andrews Air Force Base. Many additional flight operations also occur at the many general aviation airfields in the region. In addition, it is EQAC's perception that low-flying helicopter traffic has markedly increased over Fairfax County's residential neighborhoods in the last several years.

Both National and Dulles Airports are heavily used and are an important part of the region's overall economy; there was an average of roughly 55,000 total flights conducted per month at these airports in 2007. This activity is made up of commercial flights between the Washington area and 140 domestic and international destinations. At National, most flights are short to mid-range jet aircraft flights operated by major airlines. All types and sizes of aircraft operate at Dulles. The number of daily operations at Dulles Airport varies significantly, with weekday operations typically exceeding weekend day operations by several hundred flights. Most flights operate between 7:00 A.M. and 10:00 P.M., with many flights in some hours and a relatively small number in other hours. Peaks are typically at 7 A.M., 12 P.M., 5 P.M. and 8 P.M., with low times at 10 A.M., 2 P.M., 6 P.M. and between 10 P.M. and 6 A.M.

National has about half as many flights as Dulles, with more than 700 flights on a typical day. Weekday operations are typically greater than weekend day operations. Most flights occur between 7 A.M. and 10 P.M., with a fairly consistent number of

scheduled operations for each hour within this period. National is under the Federal Aviation Administration's High Density Rule, which limits, with some exceptions, the air carriers to 37 scheduled operations per hour and the commuter carriers to 13 scheduled operations per hour.

The Metropolitan Washington Airports Authority, which operates both National and Dulles Airports, has historically monitored aircraft and community noise around the clock at 32 locations in the Washington, D.C. Metropolitan Area. The monitoring equipment has evaluated different sound events and has separated those events likely to have been caused from aircraft from the remaining events, which have been attributed to the community. The Metropolitan Washington Council of Governments' Committee on Noise Abatement and Aviation at National and Dulles Airports (now known as the Aviation Policy Committee) and the Airports Authority selected the monitoring sites from recommendations offered by the local governments. Due to the age of the monitoring system, the system has become unreliable, and MWAA has discontinued publication of quarterly monitoring reports. A new monitoring system has been acquired and is currently being installed; it is anticipated that installation will be completed by the end of 2008. MWAA will now be monitoring noise at 40 locations throughout the metropolitan Washington area, including 15 locations in Fairfax County. These sites will include four new Noise Monitoring Terminals, one relocated site, and the replacement of Noise Monitoring Terminals at 10 of the previous monitoring locations.

Table IX-1-1 contains summary information regarding noise impacts based on past noise measurements taken from selected noise monitoring stations north of National Airport. This information has been excerpted from data compiled by Citizens for the Abatement of Airport Noise and does not reflect original data from MWAA. The information provided by CAAN shows pronounced changes in the noise intensity pattern. Decibel levels are measured on a logarithmic scale; thus, an increase of 3.0 dB represents an approximate doubling of sound intensity, while an increase of 10.0 dB represents a ten-fold increase.

Based on the CAAN information, it is immediately apparent that noise levels since the year 2000 (prior to the events of September 11, 2001, which resulted in substantial changes in operations at National Airport) have diminished, in some cases markedly, on the Maryland side of the Potomac River, while in some locations on the Virginia side they have roughly doubled. Some residents have observed changes in flight paths that bring planes at low altitude directly over neighborhoods in Virginia, where prior to September 11, 2001 such low overflights were a rarity. The data presented in Table IX-1-1 appear to correlate with these observations. The MWAA noise monitoring system that was used to obtain the measurements reported in Table IX-1-1 has been out of service for more than two years. As noted above, MWAA has indicated that installation of a replacement noise monitoring system will be completed by the end of 2008. EQAC looks forward to reviewing new airport noise monitoring data.

Table IX-1-1

**Day-Night Average Sound Levels in Decibels
for Noise Monitoring Stations North of National Airport**

Monitoring Station Location	Year 2000	April 2004-March 2005	April 2005-March 2006	Change between 2004/5 and 2005/6	Change since the year 2000 (pre-9/11/01)
Rosslyn	62.6	59.9	59.9	0.0	-2.7
Chain Bridge	66.6	58.2	57.8	-0.4	-8.58
Langley Forest	52.2	54.1	55.2	+1.1	+3.0
Great Falls	51.5	51.4	53.9	+2.5	+2.4
Chevy Chase	58.3	58.8	51.3	-7.5	-7.0
Cabin John	55.9	58.7	55.7	-3.0	-0.2
Avenal	59.2	60.2	49.0	-11.2	-10.2

Source: Citizens for the Abatement of Airport Noise Web site: <http://www.caan.org/factsfigs.html>

In 2007, the Airports Authority's noise complaint centers at National and Dulles reported receiving 214 noise complaints; National reported 102 complaints while Dulles reported 112 complaints.

MWAA reports that National Airport has one of the strictest noise regulations in place at any major airport in the United States. All aircraft operating between 10:00 P.M. and 7:00 A.M. must satisfy the airport's nighttime noise limits or face monetary fines of \$5,000.00 maximum per violation.

Resources:

Metropolitan Washington Airports Authority

Community Relations and Noise Abatement	703-417-8745
National Airport Noise Complaints	703-417-8020
Dulles International Airport Noise Complaints	703-572-8215

Federal Aviation Administration

Washington National Airport	703-413-1530
Dulles International Airport	703-471-1270
FAA Noise Ombudsman	202-493-5047

Other Aviation Facilities

Andrews Air Force Base-(auto information line)	301-981-1110
Baltimore-Wash Int'l Airport-complaints	410-859-7021

2. Additions to Washington Dulles International Airport

On October 14, 2005, the Federal Aviation Administration published a Record of Decision for the construction of new runways, terminal facilities and related facilities at Dulles Airport. The publication of this document completed the lengthy Environmental Impact Statement process for this project, providing the Metropolitan Washington Airports Authority with the approval needed to proceed. Two new runways have been authorized: a north-south oriented runway to be constructed parallel to and 4,300 feet west of the westernmost of two existing north-south runways and a runway roughly oriented east-west that will be constructed parallel to and 4,300 feet south of the existing east-west runway.

Construction of the fourth runway began in May 2006. The new concrete runway will be 9,400 feet long and 150 feet wide. The project includes the new runway, a parallel taxiway, connector taxiways and cross-field taxiways that will connect to the terminal and existing airfield areas. The fourth runway is scheduled to be operational in November 2008. It is anticipated that one of the existing north-south runways will be taken out of operation for maintenance purposes for at least several months after the new north-south runway opens. Therefore, normal four-runway operations will not be likely until the second half of 2009. MWAA staff has suggested that a considerable amount of time will be needed after that (MWAA staff has suggested that at least one year is needed) to fully evaluate experiences under the new runway configuration to determine if operational changes should be pursued to reduce noise impacts. Both county staff and EQAC have recommended in the past that MWAA and FAA be requested to evaluate flight operations under the new runway configuration and to identify operational approaches that can be pursued to minimize noise impacts. EQAC continues to feel that such an analysis is warranted and should be requested. Further, EQAC strongly believes that evaluation of noise impact (to include both 24-hour noise monitoring and operational analysis) should begin at the time the new runway is opened for use and should continue in perpetuity, especially through the time period incorporating one year beyond the reopening of the runway that is taken out of service for maintenance. The results of all such noise evaluations should be reported quarterly and should be provided to a number of stakeholders including the Fairfax County Board of Supervisors, EQAC and relevant county staff.

Construction dates for the fifth runway will be set in the future.

There are many other projects under way at Dulles Airport, including:

- The construction of an “AeroTrain” system to replace the existing Mobile Lounges with an underground rail system (scheduled to open in the second half of 2009)
- Improvements to the airport roadway system and connections to Route 28 and the Dulles Access Road
- Expansion of Concourse B to add 12 new airline gates
- Expansion of the International Arrivals Building

In addition, the new air traffic control tower became operational in 2007.

3. Part 150 Noise Compatibility Planning for Ronald Reagan Washington National Airport

Portions of the following discussion have been excerpted and modified slightly from the Web site of the Metropolitan Washington Council of Governments:

MWAA has prepared a major update of the Noise Compatibility Study for Ronald Reagan Washington National Airport. This study, conducted in accordance with the provisions of the Federal Aviation Administration's "Part 150" process, has been designed to forecast future noise contours at Reagan National and to propose abatement and mitigation actions to reduce community noise impacts. A study report containing a series of recommended noise abatement and mitigation measures was released in September 2004. Noise abatement recommendations include, among other things, the application of improved technology to keep arriving and departing aircraft over the Potomac River up to their designated turning points, an improved distribution of turning points from the Potomac River between five and ten miles south of the River and the improvement of the Airport's noise monitoring and flight tracking system. In October 2004, the Fairfax County Board of Supervisors endorsed staff comments concerning these recommendations; the comments were generally supportive of the noise abatement recommendations but recommended a follow-up assessment of the effectiveness of these measures.

Because of the importance of this issue to the community, the Metropolitan Washington Council of Governments' Committee on Noise Abatement and Aviation at National and Dulles Airports (now known as the Aviation Policy Committee) partnered with MWAA throughout the process of development of the noise abatement and mitigation recommendations. A Part 150 Study Advisory Committee was established to assist and advise the Airport Authority in this study; indeed the Advisory Committee's recommendations were incorporated into the Part 150 Study document. In all, the Part 150 Study recommended eight noise abatement measures (measures designed to reduce noise impacts) and six noise mitigation measures (measures taken to promote compatibility with and awareness of noise impacts). The recommended noise abatement measures were:

- Efforts supporting the use of advanced navigation technology.
- Two measures addressing the dispersal of flight paths in the area between five and ten miles south of the airport
- Revision to the Airport Facility Directory reflecting current noise abatement procedures
- Phasing out of "hushkitted" Stage 3 aircraft
- Updating the airports noise monitoring and flight tracking system
- Establishing a system to report airline compliance with noise abatement measures
- Enhancement of the noise complaint system

Five of the six mitigation measures were directed toward neighboring localities (e.g., disclosure of noise impacts; building code modifications; noise overlay zoning) and the sixth recommended an expanded MWAA airport noise information program.

MWAA submitted the Part 150 study to the Federal Aviation Administration, and FAA completed its review of, and issued a Record of Approval for, the Noise Compatibility Program in early 2008. Four of the eight proposed noise abatement measures were approved, and all six of the mitigation measures were approved with the acknowledgment that these measures were beyond the authority of FAA. Four noise abatement measures were disapproved for the purposes of Part 150—in disapproving these measures, FAA noted that the noise exposure model and noise compatibility program for the airport showed “no present or forecasted incompatible land uses within the DNL 65 dB” contour. Effectively, FAA is precluding expenditures of agency funds for noise abatement projects that would support actions that would be applied in areas outside the DNL 65 dBA contour, with the recognition that MWAA or Air Traffic Control could pursue similar or supportive actions at their discretion (and in the case of noise monitoring and flight tracking, at MWAA’s expense). As noted in FAA’s Record of Approval, a working group has been formed to develop advanced navigation procedures for arrivals and departures and to encourage the use of this technology, and MWAA is updating the noise monitoring and flight tracking system.

Nevertheless, EQAC continues to share the concerns of communities both north and south of National Airport regarding noise impacts associated with airport operations and holds that noise impacts do not stop at the DNL 65 dBA model contour shown in the Part 150 study. The DNL 65 dBA contour for National Airport encompasses a relatively small area that is located largely on airport property and within the Potomac River; some commercial, industrial and governmental areas are also located within this area, as is park land. No residences are located in areas that are currently exposed to, or that are projected to be exposed to, noise impacts of DNL 65 dBA or above. However, there have been significant concerns about airport noise impacts well outside this area, and operational noise abatement procedures have been established to minimize such impacts both north and south of the airport. Deviations to noise abatement procedures north of the airport have been documented by the McLean Citizens Association in collaboration with Congressman Wolf’s office. While these impacts have occurred well beyond the DNL 65 dBA contour, they have had a significant and adverse impact to residents of the area.

4. The Aviation Policy Committee

The Aviation Policy Committee is a committee of the Metropolitan Washington Council of Governments that provides guidance to the COG Board of Directors on airport and aviation policy-related matters and that has been delegated by the COG Board of Directors to speak on its behalf on noise policy matters. The committee, which changed its name in 2006 from the Committee on Noise Abatement and Aviation at National and Dulles Airports, provides a broad, balanced and integrated perspective on matters relating to airport and aircraft policies.

The APC has collaborated and will continue to collaborate with MWAA in implementing major recommendations resulting from the Part 150 Noise Compatibility Study for Reagan National Airport. The committee will also continue to focus on noise abatement strategies for implementation at both Reagan National and Dulles Airports, with emphasis on review of emerging national legislation and studies on their impact on local noise strategies. Toward this end, the Committee drafted a resolution that was adopted by the COG Board in June 2008 opposing efforts to usurp regional and local authority over the region's airports and to weaken the slot and perimeter rules affecting operations at National Airport. The committee will also focus on the growing role general aviation plays in economic development and quality of life in the region.

The APC will also continue to focus on developing implementation strategies for the recently completed Regional Helicopter System Plan.

C. HIGHWAY NOISE

1. Background

Traffic in the Washington metropolitan area continues to grow, resulting in increasing traffic on the region's roads. Increasing traffic volumes on the county's roadways have had the consequence of increasing transportation-related noise impacts to residential areas adjacent to these roadways. As more lanes are added and some new roads are constructed, increased traffic generates more noise that creates demands for noise attenuation or abatement measures such as:

- The construction of barriers/walls or raised berms
- The provision of landscaping/vegetation
- The provision of acoustical design techniques

Barriers have become the most popular choice. Since the early 1990s in Fairfax County, barriers constructed by the Virginia Department of Transportation have consisted of a solid wall of absorptive concrete that breaks the line of sight between vehicles and homes. Although noise barriers typically have a maximum decibel reduction of 20 dBA, most only provide 10-12 decibel reductions.

Noise is an important environmental consideration for highway planners and designers. The U.S. Department of Transportation and state transportation agencies are charged with the responsibility of optimizing compatibility of highway operations with environmental concerns. Highway noise problems have been addressed by numerous investigations, including evaluations of the following:

- Noise sources and highway noise reference energy mean emission levels
- Noise impacts at receptor locations

- Effects of site geometry, meteorology, ground surface conditions, and barriers on noise propagation
- Alternative methods of mitigating noise impacts

Precise, uniform, state-of-the-art highway traffic noise measurement procedures for assessing impacts in the vicinity of roadways, and designing effective cost-efficient noise barriers, are recognized needs in the highway noise community.

2. State Policy

Virginia adopted its original noise abatement policy in 1989. The policy established criteria for providing noise protection in conjunction with proposed highway projects in the state. Implementation of the policy has aided in the construction, or construction approval, of more than 100 federally-funded sound barriers. Experience with this policy created considerable feedback from residents and elected officials. As a result, the Commonwealth Transportation Board decided to evaluate the policy for possible changes. The major source of information used was a survey of 15 state departments of transportation in the eastern U.S. The culmination of this process was the adoption of changes to the state policy in November 1996, which became effective in January 1997.

The key changes to the policy were to:

- Raise the cost-effectiveness ceiling from \$20,000 per protected receptor to \$30,000 per protected residential property based other state practices.
- Clarify that Virginia will not participate in any retrofit project along an existing highway when not in conjunction with an improvement for that highway.
- Add the possibility for third party funding of the amount above VDOT's \$30,000 ceiling if the abatement measure otherwise satisfies the criteria.

3. State Projects in Fairfax County

VDOT has constructed the following sound barriers in FY 07-08:

- One sound barrier with third party funding, associated with the West Ox Road widening between Penderbrook Road and Ox Trail
- One new sound barrier system along the I-95 Outer Loop west of the Richmond Highway (U.S. Route 1) interchange (associated with the Woodrow Wilson Bridge Project)

Consistent with federal/state policies and guidelines, noise barriers have been approved for the following highway construction projects underway in FY 08-09:

- One replacement and enhanced noise barrier system and two new noise barrier systems associated with the Interstate 95/Telegraph Road interchange improvements (Woodrow Wilson Bridge Project)

- One replacement and five new noise barrier systems associated with the Interstate 95 4th lane widening project
- Nine replacement and enhanced noise barrier systems, six new noise barrier systems and one new noise barrier system with third party funding associated with the I-495 Capital Beltway High Occupancy Toll/Bus/High Occupancy Vehicle lanes project

4. Noise Study Submission Guidelines

On July 24, 2000, the Board of Supervisors adopted Zoning Ordinance Amendment ZO 00-330, which permits noise barriers in excess of the Zoning Ordinance fence/wall height limitations where needed to reduce adverse impacts of highway noise on properties adjacent to major thoroughfares, or to reduce adverse noise impacts of commercial and industrial uses on adjacent properties. A noise impact study is required to demonstrate the need for the noise barrier and the proposed height and level of mitigation to be achieved by the noise barrier.

D. COMMENTS AND ONGOING CONCERNS

1. Continue to support airport noise-compatible land use planning near airports in the county through the implementation of policies and regulations that reference the most current airport noise contour projections for the airports and that are at least as stringent as federal noise compatibility guidelines.
2. Continue to encourage the use of opportunities provided by the Virginia Department of Transportation that allow for third party contributions to noise barrier construction when the VDOT cost criteria preclude VDOT's construction of such barriers. Through this VDOT policy, neighborhoods affected by high levels of highway noise can participate in the funding of barriers that would not otherwise be constructed.
3. Staff should continue to review all airport and highway studies that require Environmental Assessments or Environmental Impact Statements under the National Environmental Policy Act for consistency with county policies addressing transportation-related noise and mitigation and report its findings to the board. In turn, the Board of Supervisors should, when appropriate, adopt resolutions with specific requests and/or recommendations and transmit these to the Metropolitan Washington Airports Authority, Federal Aviation Administration, Commonwealth Transportation Board, Virginia Department of Transportation and other state and federal agencies as applicable.
4. Encourage the retention and planting of noninvasive vegetation to provide visual shielding of residents from highways. Where possible, support the provision of vegetated areas adjacent to highways that are wide enough and dense enough to provide noise reduction benefits to residential areas near the highways. Where feasible and appropriate, pursue such approaches in lieu of noise walls.

E. RECOMMENDATIONS

1. In recognition of the anticipated opening of a new fourth runway at Washington Dulles International Airport in late 2008 and the future construction of a fifth runway, EQAC recommends that the Board of Supervisors formally request the Metropolitan Washington Airports Authority and the Federal Aviation Administration to evaluate options for the operation of the existing and new runways to identify approaches that will optimize flight operations in a manner that minimizes community noise exposure. This evaluation should include both an assessment of 24-hour noise monitoring and an analysis of operational approaches. The evaluation of noise impacts should begin at the time the first of the new runways is opened for use and should continue in perpetuity, especially through the time period incorporating one year beyond the reopening of any runway that is taken out of service for maintenance. The results of all such noise evaluations should be reported quarterly and should be provided to a number of stakeholders including the Fairfax County Board of Supervisors, EQAC and relevant county staff.
2. EQAC is pleased that a series of Web pages have been established on the county's Web site addressing noise issues. The county should ensure that this page is kept current through regular updates.

REFERENCES

Cuttler, William C., July 3, 2008 letter to James P. Zook, Director, Fairfax County Department of Planning and Zoning.

Fairfax County Virginia Noise Web site: <http://www.fairfaxcounty.gov/dpz/environment/noise/>

Federal Aviation Administration, 2007, Ronald Reagan Washington National Airport, Volume 1, FAR Part 150 Noise Exposure Maps and Noise Compatibility Program (available at http://www.metwashairports.com/_/File/_/NCProgramUpdate.PDF)

Metropolitan Washington Airports Authority Web sites:
<http://www.metwashairports.com/> (Home page)

Metropolitan Washington Council of Governments Web sites: (<http://www.mwcog.org> (Home page))

Metropolitan Washington Council of Governments, Aviation Policy Committee Web site:
<http://www.mwcog.org/environment/airport/conaanda/>

Phillips, Neal, June 23, 2008 letter to James P. Zook, Director, Fairfax County Department of Planning and Zoning

IX-2. LIGHT POLLUTION

A. OVERVIEW

Light pollution is a general term used to describe light output, primarily from exterior (outdoor) sources, in commercial, residential and roadway settings that is excessive in amount and/or that causes harmful glare to be directed into the path of travel or into residential neighborhoods. Light pollution is thus both a safety issue and a quality of life issue. With the increasing urbanization of Fairfax County, exterior (outdoor) lighting and light pollution in its many forms have become pressing issues to our communities. In the past, Fairfax County had some regulations regarding exterior lighting, but they were minimal and out of date. A major effort was undertaken in 2002 to write a totally new and modern Outdoor Lighting Ordinance that took into account the numerous advances that have been made in lighting technology in recent years. This highly successful effort utilized several workshops, in which EQAC and a number of local experts participated, and came to fruition in the early summer of 2003 with the adoption of the new Outdoor Lighting Ordinance. It is regarded by experts in the outdoor lighting community as being one of the best such ordinances in the mid-Atlantic region and has been cited and largely copied by localities in Connecticut, Illinois and California. However, there are one or two areas that could not be adequately addressed by the new ordinance, since suitable standards and convenient measurement technology were not available. This report will focus on these areas.

B. RESPONSE OF THE HUMAN EYE TO LIGHT

To put the following sections in proper context, it is helpful to briefly review how the human eye perceives and reacts to light. The various cells of the retina of the eye contain what are called visual pigments. These pigments, in the fully dark-adapted condition, are complex proteins consisting of two linked components. The pigments respond to light by “bleaching” (actually the dissociation of the two protein moieties). The brighter the light, the greater is the bleaching and the longer the regeneration time. The greater the bleaching, the lower is the sensitivity of the retinal cell. The retina contains three types of sensory cells:

1. The rods, which are most numerous toward the periphery of the retina and contain the visual pigment rhodopsin. They are useful primarily in low light and provide monochromatic images.
2. Three types of cones, mostly concentrated in the central portion of the retina and which provide color vision. They contain respectively photopsin I (erythrolabe), photopsin II (chlorolabe) and photopsin III (cyanolabe). Their peak sensitivities are in the red, green and blue portions of the spectrum just like the sensor chip in a digital camera. (George Wald received the 1967 Nobel Prize in Medicine for his work on the three kinds of cone photopsins.)

3. The spidery retinal ganglion cells, containing the visual pigment melanopsin. These cells perform two different functions: control of the size of the pupil of the eye in response to light and as the control that resets the body's day-night cycle clock. Prolonged exposure of melanopsin to bright lights during normally dark periods of the evening and night can result in significant disturbances of the sleep-wake cycle.

C. ISSUES AND PROBLEMS

The main issues and problems of exterior lighting and light pollution may be summarized as follows:

1. Glare

Glare, as defined by the Illuminating Engineering Society of North America, falls into three main categories:

- Disability glare – Disability glare (sometimes less accurately referred to as veiling luminance) is caused by overly bright light sources that shine directly into one's eyes and is dangerous because it is blinding (i.e., it totally overloads the eye's light sensor cells).
- Discomfort glare – Discomfort glare may not necessarily reduce the ability to see an object, but it produces a sensation of discomfort due to high contrast or non-uniform distribution of light in the field of view.
- Nuisance or annoyance glare – Nuisance glare is that which causes complaints such as, "The light is shining in my window."

Glare is a significant and pervasive problem that seriously impairs both safety and quality of life. Glare demands attention in that one's eyes are naturally attracted to bright light, and at night this destroys the eye's dark adaptation (the eye's sensitivity to lower light levels), which is a serious hazard for both drivers and pedestrians.

Obtrusive lighting by commercial establishments to attract attention is a serious problem as is selection of inappropriate fixtures for exterior residential lighting. A major problem is the high intensity lighting of sports facilities, such as ball fields and tennis courts, adjacent to residential neighborhoods. Glare and excessive illumination (which are two separate problems) cast into surrounding residential neighborhoods not only detracts from the quality of life but can make it difficult for pedestrians and homeowners to see their surroundings.

2. Light Trespass

Light trespass is the poor control of outdoor lighting such that it crosses property lines and detracts from the property value and quality of life of those whose property is so invaded. It is particularly common when obtrusive commercial or recreational lighting

is immediately adjacent to residential neighborhoods or when a homeowner uses inappropriate fixtures, light levels and lighting duration, often in the interest of “security.” It is generally categorized in two forms:

- Adjacent property is illuminated by unwanted light.
- Excessive brightness (often called “glare”) occurs in the normal field of view.

Both of these forms may be present in a given situation. Illumination, that is, the amount of light energy falling on a surface, is readily measured by simple hand held instruments and is expressed in foot candles. The new ordinance establishes 0.5 foot candles as the limit of illumination at the property line of the property producing the illumination. Illumination levels above that are regarded as prohibited light trespass onto adjacent properties.

Glare or excessive brightness is a more complex and difficult-to-measure phenomenon. It is experienced when the light producing source (the bulb) is directly visible, but also depends on the luminance of the source and on the contrast between that source and the surrounding background. For example, even a very bright light source viewed against a noonday sky doesn’t seem particularly glaring or objectionable, but the same source viewed against a night sky is very objectionable and seems so bright as to be almost painful. One of the problems in addressing this kind of light trespass, or more properly glare trespass, is that there have not been good standards for acceptable limits, and instruments to measure this kind of glare are necessarily complex and difficult to operate.

3. Security

Much outdoor lighting is used in the interest of providing security. These safety concerns often result in bad lighting rather than real security. One reason often cited for today's bright lights is that high wattage is needed to deter crime. However, studies have shown that if light is overly bright with excessive glare it makes it easier for a person to hide in the deep shadows created by objects in the harsh glaring light. This might actually encourage crime rather than discourage it. The debate as to whether or not additional light provides more safety has been emotional rather than factual. The few rigorous studies that have been done reveal no connection between higher lighting levels and lower crime rates. This may be due to people with nefarious intent taking more risks in better lit areas. For example, the National Institute of Law Enforcement and Criminal Justice found no statistically significant evidence that lighting impacts the level of crime (Upgren, 1996). Thus, the supposed correlation between a high level of security lighting and reduced crime appears to be nothing more than a popular myth.

4. Urban Sky Glow

Urban sky glow is brightening of the night sky due to manmade lighting that passes upward with the light rays reflected off of submicroscopic dust and water particles in

the atmosphere. Although urban sky glow was first noted as a problem by the astronomical community, it is by no means any longer solely an astronomical issue. With the increasing urbanization of many areas of the U.S., all residents in those areas are now being affected. In Fairfax County, which is now a mostly urban county, improper lighting has seriously degraded the darkness of our local night skies into a pallid luminescence that many of our residents find objectionable.

5. Energy Usage

Smart lighting techniques, which direct all of the light generated onto the target area, reduce energy consumption and hence the use of fossil fuels. Several engineering estimates suggest that at least 30 percent of outdoor lighting is being wasted through light energy spilling upward and outward rather than being directed downward onto the target area. Also, many installations are greatly over-illuminated as well as being lighted for unnecessary durations, further compounding the energy wastage. Inefficient lighting incurs both direct financial costs and hidden environmental costs. It has been estimated by national organizations studying light pollution that in excess of \$8 billion of electricity is being wasted annually on obtrusive and inefficient outdoor lighting (see data from Virginia Outdoor Lighting Task Force and the International Dark-Sky Association). Since electricity generation in the eastern part of this country is mostly from fossil fuels, every unnecessary kilowatt of electrical energy generated also produces air pollution, unnecessary greenhouse gases and acid rain.

D. CURRENT COUNTY STANDARDS AND REGULATIONS

In EQAC's view, Fairfax County now has an excellent ordinance that prescribes limits for the maximum wattage of light sources and for the amount of illumination and glare in commercial and residential districts. However, existing installations that were noncompliant under the new ordinance are allowed under state law to continue until such time as the fixture requires replacement. Also, these standards do not cover roadways that are under the jurisdiction of the Virginia Department of Transportation, and a number of these roadway fixtures represent a continuing source of glare and light pollution

An important shortcoming of the otherwise excellent ordinance is that the effects of glare into residential neighborhoods from sources such as nearby park lights and lights on nearby commercial buildings and school facilities are not fully addressed.

Fairfax County's *Policy Plan: The Countywide Policy Element of the Comprehensive Plan* (2000 Edition) recognizes the nuisance of light emissions arising from increasing urbanization and recommends that efforts be made to avoid creating sources of glare that interfere with residents' and/or travelers' visual acuity. To put this into practice, the county's Zoning Ordinance contains standards for illumination limits. **However, the issue of glare, as opposed to illumination level, has not yet been addressed adequately.**

E. ADDRESSING THE PROBLEM

While the new ordinance very adequately addresses new and replacement installations of outdoor lighting and fixtures in commercial and residential districts, much roadway lighting remains a problem because it is prescribed by VDOT, which is not subject to local control. The recently passed Virginia law and policy to use henceforth only fully shielded fixtures will eventually mitigate these problems as older fixtures are replaced. Ensuring that new residential installations meet code requirements represents a potentially significant compliance problem and will require that both review and inspection personnel be fully aware of the new code requirements and diligent in the application and enforcement of them.

One of the most common street lights in use, the drop-lens, cobra-head fixture, draws 150 watts. A fixture with reflective backing and shielding can direct all light below the horizontal plane with the same illumination of streets and homes and use only 100 watts. The same possibility exists with the popular 175 watt unshielded mercury vapor lamp. Both the 150-watt cobra-head fixture and the 175-watt mercury vapor lamp cast light laterally as well as down. As a result, substantial glare is often cast directly into the eyes of drivers. This glare destroys drivers' dark adaptation, creating potential safety hazards. In many cases the driver is not able to see the roadway as well as he or she would with lower-wattage properly shielded lights, and in many cases his or her vision is made much worse. Because they cut down on glare, shielded fixtures not only are safer for drivers, but, according to experts (see references), actually make it easier for pedestrians and home owners to see their surroundings.

By redirecting this wasted energy, lower wattage lights provide the same amount of illumination in the areas where it is needed. These fixtures have reflective backing and full cut-off shielding to direct all light below the horizontal plane, with 90 percent of the light directed below an angle of 20 degrees from the horizontal. For example, a 50-watt metal halide lamp with a reflective shield will provide as much illumination below the horizontal plane as the 150-watt cobra-head fixture or the 175-watt unshielded mercury vapor lamp. These newer types of fixtures, which are recommended by the Illuminating Engineering Society of North America, are widely available and direct all light below the horizontal plane, thereby eliminating lateral glare (see Figure IX-2-1). It is estimated that it takes only three years of energy savings to recoup the initial investment in these fixtures. The lower wattage fixtures provide energy savings, improved driver safety, better visibility for pedestrians and an improved ambiance and security for neighborhoods. Several municipalities, such as Tucson, Arizona, San Diego, California and Sanibel Island, Florida, have adopted street lighting ordinances requiring these newer fixtures.

Most security lighting is overdone, with high wattage lights burning from dusk to dawn. As noted earlier, constant levels of illumination tend to be largely ignored because they are commonplace, and they waste a huge amount of energy. The large amount of glare produced by high intensity sources creates shadows that provide hiding places for intruders. Moreover, the constant glare and light trespass onto adjacent properties is a major source of annoyance to their occupants. On the other hand, lights that are activated

by motion within a controlled area attract immediate attention and, at the same time, use very little energy and create intrusion on adjacent properties only when such attention is desired. For example, if one is using 300 watts of security lighting for an average of 10 hours each night and converts to an infrared motion sensor control that turns on the lights only when there is motion in the controlled area, energy cost is reduced to almost nil. In addition, the cost of the added sensor-control hardware can be recovered in as little as two to four months due to the energy saving. At the same time, security is increased rather than decreased and glare and light trespass onto adjacent properties is largely eliminated.

Glare is a significant and pervasive problem, but one that is relatively easily solved by installing “full cut-off”, i.e., fully shielded light fixtures, or in some cases using supplementary shielding panels, to prevent light trespass onto adjacent residential properties. Where it is not possible to completely eliminate glare through the use of shielded fixtures, inexpensive motion detector controls can limit the harsh light to only a few minutes when it is really needed.

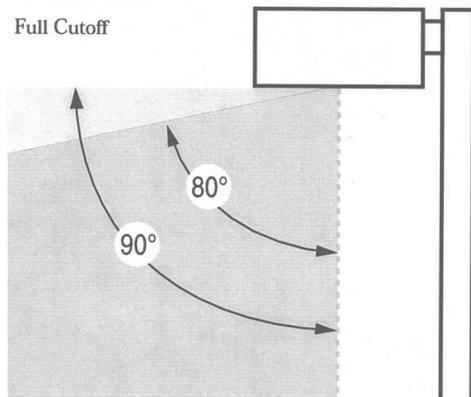
Light trespass is a term of relatively recent origin and denotes (1) glare that is generated by sources on one property that lie within the normal field of view of the occupants of another property and (2) light that spills over the boundaries of one property onto another, thereby producing unwanted illumination of it. Increasingly, such light intrusions are being regarded as trespass violations every bit as serious as physical trespass of a person onto the property of another. Such problems can now be readily avoided by the selection of proper fixtures, intensity levels and the use of timers and sensors/controllers.

Sky glow is also readily addressed by the selection of properly designed modern fixtures for new installations and phased retrofit of current inadequate installations. The cost of such retrofits is normally recoverable within a reasonable time period (usually estimated at about three years) through efficiently placing all of the light onto the desired area and the resulting lower energy usage.

Adherence to the following four principles will do much to mitigate or eliminate light pollution.

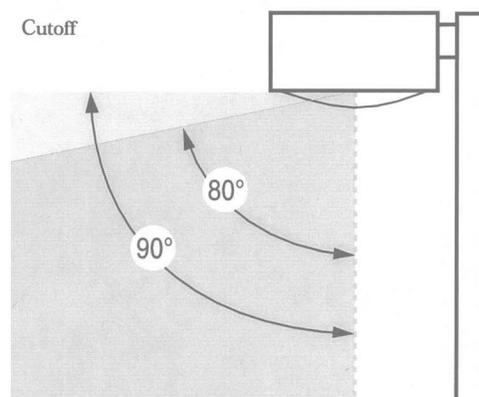
- Always illuminate with properly shielded fixtures that prevent the light source itself, and the resultant glare, from being directly visible. This is done by using cutoff fixtures or supplementary shielding that keeps all of the illumination below the horizontal plane and directed onto the target area.
- Do not over-illuminate. Never use more illumination than needed for the task at hand. Using a 400 watt floodlight to illuminate a small parking area or a flag at night is overkill and wastes a great deal of energy. A properly shielded and adjusted 250 watt luminaire (light source + fixture) can illuminate an area just as effectively as an older style 1,000 watt light source.

Figure IX-2-1
Effects of Cut-off and Non Cut-off Luminaires



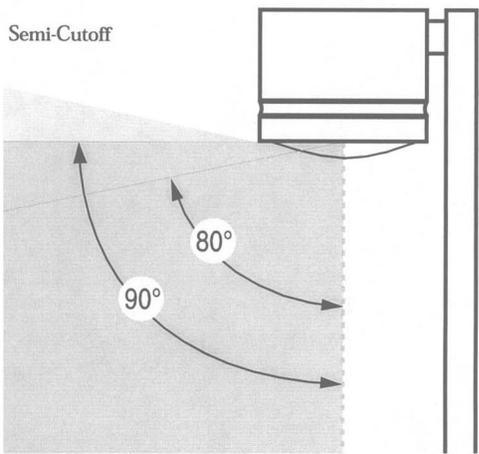
ALLOWS:

- No light at 90 degrees
- 100 cd per 1000 Lamp Lumens at 80 degrees



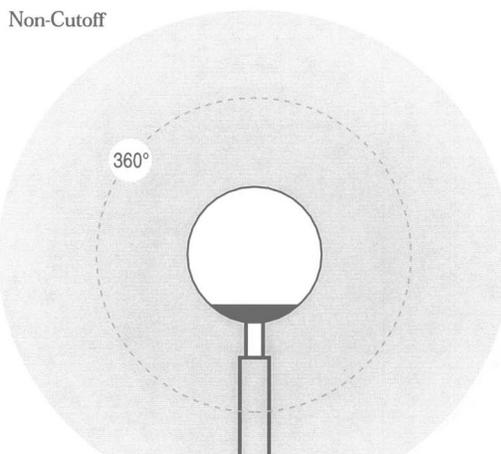
ALLOWS:

- 25 cd per 1000 Lamp Lumens at 90 degrees
- 100 cd per 1000 Lamp Lumens at 80 degrees



ALLOWS:

- 50 cd per 1000 Lamp Lumens at 90 degrees
- 200 cd per 1000 Lamp Lumens at 80 degrees



ALLOWS:

- Unrestricted distribution of light at any angle

(Sources: Paulin, Douglas, *Full Cutoff Lighting: The Benefits*, IESNA Web site, and Shaflik, Carl, *Environmental Effects of Roadway Lighting*, Information Sheet Number 125, International Dark-Sky Association, Tucson, Arizona, August 1997.)

- Always aim lighting downward, keeping all of its distribution within the property lines and below the horizontal plane so that it is not a source of glare. Light trespass onto adjacent properties is unnecessary, inconsiderate and potentially illegal.
- Do not burn lighting all night long with the intention of improving security. Using infrared motion sensor-controlled lighting that comes on instantly when there is motion in the designated area is far more effective as a security measure. That rapid change from dark to light draws the immediate attention of everyone in the surrounding area, including security and law enforcement personnel on patrol, and may well be unsettling enough to cause illicit intruders to immediately flee. Lighting that stays on all night draws no special attention and is an enormous waste of energy.

F. PUBLIC AGENCY RESPONSIBILITIES

Ensuring compliance with glare standards for residences and other private property is the responsibility of the county's Zoning Enforcement Branch. The county has 18 Zoning Inspectors (two per magisterial district) to oversee all Zoning Ordinance enforcement. Any enforcement activity dealing with light is complaint-driven. Typically, light-related complaints represent about 0.5 percent of total complaints. The county does not respond to anonymous complaints. Complaints are either filed directly with the Zoning Enforcement Branch or are forwarded by the staff of a member of the Board of Supervisors. The causes of the complaints have usually been fast food establishments, security lighting for residences, athletic facilities (e.g., ball fields, driving ranges), or churches. The Zoning Inspectors typically resolve violations with informal enforcement such as a verbal warning that there is a violation and how it may be remedied. A written notice of violation or civil action can be used if needed. Beyond the general glare standards, the county frequently is able to impose additional "before-the-fact" restrictions through the rezoning, special permit and special exception processes

The Fairfax County Park Authority and the Fairfax County Public Schools are the two largest users of recreational and sports field lighting in the county. Parks and schools by their very nature are usually located in the midst of residential communities where their outdoor lighting, if inadequately designed, can seriously impact the surrounding residents. Schools, particularly high schools, often have sports practice sessions extending into the early evening hours and games that begin after the dinner hour and run into the later evening hours. In addition, schools of all categories often have "security" lights that burn from dusk to dawn. Our park system, faced with increasing demand for team athletic facilities, will necessarily have to turn to synthetic turf and lighting during the evening to enable greater utilization of its existing fields. It is the responsibility of both organizations to utilize better designs and better equipment than employed heretofore in addressing these needs. To do less unnecessarily and unfairly impacts the surrounding neighborhoods and diminishes both property values and quality of life.

One of the most onerous sources of light pollution is the obtrusive lighting of commercial and industrial facilities, particularly commercial retail and service establishments. While

their desire to attract attention to themselves is understandable, abusive excesses degrade the overall ambience of our commercial areas and materially degrade the quality of life in adjacent residential neighborhoods. This is of particular concern in the case of “by-right” development, where there are no public hearings (e.g., Planning Commission, Board of Zoning Appeals, Board of Supervisors) at which adjacent property owners and neighborhoods can register their concerns and see approval conditioned on appropriate restrictions. In such “by-right” cases, the initial responsibility would necessarily fall almost entirely upon the Land Development Services function of the Department of Public Works and Environmental Services, which reviews all proposed plans before a building permit is issued and subsequently conducts inspections to ensure that the work is in compliance with regulations. Evaluation of plans for compliance would add a small amount of effort to the review process but would add only a negligible amount to the inspection process.

At this time, the county has no formal policies regarding street lighting. Some neighborhoods within the county prefer to have local streets lighted, while others do not. Whether or not the county provides street lighting is often driven by budget priorities, and, unless there is a demonstrable public safety need, the priority for retrofitting an established community is usually low. More often, street lighting is addressed in the overall planning of new subdivisions. In these cases, the Land Development Services function of DPWES would have responsibilities for both reviewing the plan and inspecting the implementation of it.

Responsibility for the lighting of main roadways is under the jurisdiction of the Virginia Department of Transportation. Historically, local communities and neighborhoods have had to deal directly with VDOT or through their local Supervisor’s office over roadway lighting issues. It has proven very difficult to influence VDOT’s choice of fixtures and technical standards, even when it can be demonstrated that their proposed implementation will result in unacceptable levels of glare and light trespass in adjacent residential neighborhoods. However, quite recently, encouraging headway has been made in getting VDOT to recognize the severity of the problem and to take some limited first steps to address it.

G. PUBLIC EDUCATION AND AWARENESS NEEDS

The general public needs awareness of the sources and problems of light pollution and of the methods by which these can be best addressed. The county staff has prepared an excellent and very informative 16 page booklet to explain the new Outdoor Lighting Ordinance (available at www.fairfaxcounty.gov/DPZ/Zoning/lightingbrochure.PDF). It can also be made available in printed version to individuals, homeowners groups and community associations directly through appropriate county offices and through the district offices of the members of the Board of Supervisors. The complete ordinance in convenient form is available on the Fairfax County Web site at www.fairfaxcounty.gov/DPZ/Zoningordinance/articles/Art14.PDF. In addition, the International Dark Sky Association and the Illuminating Engineering Society of North

America maintain Web sites with a variety of technical information on lighting issues and technology.

Our county's 16 page booklet provides much of the information that architects, contractors and electricians need to familiarize themselves with our lighting codes and specifically what is not permitted (e.g., unshielded security lights, angle-directed post or building mounted fixtures, wall packs without shielding or baffling, excessive wattage or unshielded floodlights, light-trespass onto other properties, etc.) and what practices are recommended. Our county review and inspection personnel should make sure that members of the development, contractor and building management communities with whom they deal will be fully aware from the outset of the revised standards in the new ordinance and how best to address them.

There is an excellent Web site (www.qualityoutdoorlighting.com) that illustrates many examples of good, bad and ill-conceived lighting practices right here in our local area. It can play a central role in education of the public.

H. CONCLUSIONS

The principal means to prevent poor exterior lighting practices is a comprehensive code or ordinance, because this provides well thought out standards for, and enforceable legal restrictions on, specific lighting practices that affect the community and its quality of life. Numerous jurisdictions have adopted codes and ordinances that have proven very effective in reducing light pollution and preventing light trespass. A properly conceived and well written code permits all forms of necessary illumination at reasonable intensities, but requires shielding and other measures to prevent light pollution and light trespass. A good code applies to all forms of outdoor lighting, including streets, highways and exterior signs, as well as lighting on dwellings, parks, schools, commercial and industrial buildings, parking areas and construction sites. A good code also provides for reasonable exceptions for special uses within acceptable time periods and subject to effective standards. In EQAC's opinion, Fairfax County's recently adopted Outdoor Lighting Ordinance is an outstanding example of such a code. As the county has gained experience with application of the new ordinance, some areas have been identified where adjustments and fine-tuning are urgently needed, but the solid foundation has been laid and should serve us well into the future.

The Fairfax County Park Authority, because of its need to increase the hours of utilization of existing sports fields by installing lights to illuminate them, bears a special responsibility to ensure that such lighting systems do not adversely impact adjacent residential properties. The results with a test rectangular field that was outfitted with lights and artificial turf have been very unfortunate. While the illumination of the field surface is excellent and the illumination at the property line with respect to light spillover meets the ordinance standards, the glare from the fully exposed, 1,500 watt lamps on 70 foot poles facing a residential neighborhood is intense (in the range of 12,000 lumens at 200 feet). A second field outfitted with an advanced

model of fixtures of the same type shows no improvement in glare. The Park Authority's recently drafted specifications do not begin to address the problem. However, the International Dark-Sky Association in its outdoor lighting handbook has colored illustrations of a field lighted with full cutoff fixtures that has no such glare problem. Specification of such better-engineered fixtures should make it possible for the Park Authority to expand the use of lighting for fields without creating public outrage. This same concern applies equally to the Fairfax County Public Schools, which also uses lighted sports fields and security lighting which burns all night.

The county needs to work closely with VDOT to achieve better lighting practices on roadways within Fairfax County that are under VDOT jurisdiction. Current VDOT lighting and proposed new installations are regarded as being very intrusive by adjacent neighborhoods. However, it should be noted that a newly enacted law requiring the commonwealth to acquire only shielded fixtures should materially improve VDOT practices in this regard on new installations and as old fixtures are replaced.

Much of the security lighting, both residential and commercial, in Fairfax County is poorly conceived, excessive in intensity and improperly directed and controlled. These deficiencies could be corrected at relatively low initial costs that would be rapidly recovered through the energy savings realized. This will require considerable public education to familiarize the using public with the issues and the available technology.

Much lighting in residential neighborhoods uses old style fixtures (or new but poorly designed ones) that cause excessive glare and light trespass onto adjacent properties. The new comprehensive ordinance and an intensive public awareness campaign should be used to address correction of these problems. Single family dwellings especially need to be brought into compliance with the spirit and provisions of the revised ordinance, for that is where the majority of us live and where our quality of life is most affected by intrusive lighting.

Poor lighting design, particularly in commercial areas, is contributing to excessive and highly objectionable sky glow. The new ordinance and retrofitting or adjustment of fixtures can eliminate the worst of this effect.

I. COMMENTS AND ONGOING CONCERNS

- 1. In response to a recommendation in earlier EQAC Annual Reports on the Environment, the Fairfax County Park Authority commissioned a study of sports field lighting design and technology. EQAC feels that this study had serious flaws in terms of the study objectives, the methodology and the evaluation criteria. The Park Authority issued a set of specifications, dated November 2006 (and largely based on this study), for new athletic field lighting installations that, in EQAC's view, does not address the issue of glare adequately. The Park Authority also commissioned a consultant to prepare a "White Paper" that would serve to justify the specifications.**

EQAC feels that this document contained serious scientific errors and thus created confusion rather than clarity. The Park Authority Director of Planning and Development has recently informed us that they have done extensive rework of this material and proposed that we hold meetings to review the revised material.

- 2. The EQAC 2004 Annual Report recommendation that the Department of Planning and Zoning place high on its work plan priorities for 2005 a modest revision of the Outdoor Lighting Ordinance to address the glare issue was not addressed. Unfortunately, following the same recommendation in the 2005 Annual Report, the issue was placed on the “Priority 2” list of the Adopted 2006 Zoning Ordinance Amendment Work Program and has therefore not been addressed. In 2007 this item was moved to the DPZ Priority 1 list, but to date work on it has not yet begun.**
3. EQAC recommends that the Board of Supervisors work with VDOT and Virginia elected officials to eliminate unnecessary roadway lighting and whenever possible to accelerate replacement of existing poorly designed fixtures under the control of VDOT with full cut-off fixtures.

J. RECOMMENDATIONS

1. EQAC recommends that the Board of Supervisors direct the Department of Planning and Zoning to move ahead as rapidly as possible on revisions to the Outdoor Lighting Ordinance. The revisions need to address glare and several minor issues.
2. EQAC recommends that the Board of Supervisors designate EQAC to work with the Fairfax County Park Authority to review and fine tune its specifications for athletic field lighting to correct the current deficiencies, including but not necessarily limited to:
 - Treatment of glare (as opposed to surface illumination)
 - Hardware specifications that may be overly restrictive or inappropriate or that give the appearance being selective for a particular manufacturer or supplier
 - Explanatory documentation for public consumption, particularly that posted on the Web site, to ensure scientific accuracy and understandability of subject matter

LIST OF REFERENCES

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Fairfax County, Virginia, Zoning Ordinance (Chapter 112 of the *Fairfax County Code*)

Illuminating Engineering Society of North America Web site, www.iesna.org (There are numerous subsidiary and related Web sites)

[International Dark-Sky Association Web site, www.darksky.org/](http://www.darksky.org/)

[National Electrical Manufacturers Association Web site, www.nema.org/](http://www.nema.org/)
(Particularly see their White Paper on Outdoor Lighting Code Issues.)

[Virginia Outdoor Lighting Taskforce Web site, www.volt.org/](http://www.volt.org/).

[Quality Outdoor Lighting Web site, www.qualityoutdoorlighting.com/](http://www.qualityoutdoorlighting.com/).

IX-3. VISUAL POLLUTION AND URBAN BLIGHT

A. OVERVIEW

Historically, the term “pollution” has referred primarily to the fouling of air, water and land by wastes or from the byproducts of human activities. In recent years it has come to signify a wider range of disruptions to environmental quality. Both noise pollution and light pollution issues have been addressed earlier in this chapter. This section focuses on visual blight/pollution issues, including such things as proliferation of signs, billboards, litter, dumps, junkyards and the like, which are important components of visual pollution.

Simply stated, “blight” is something that impairs or destroys appearance and results in a deteriorated condition. In recent times, urban blight has come to include a wide range of visual pollutants that degrade the ambience of our communities, including such things as trash and litter on roadsides, unkempt properties, above-ground power and communications transmission lines, communication towers, intrusive and objectionable advertising signage and other forms of visual impairments. Without doubt, signage that is excessive in amount and inappropriate in placement is the most ubiquitous of these “pollutants.”

B. SIGNS AND BILLBOARDS

Unnecessary signs and billboards, almost always placed as some kind of advertising, have been called "visual pollution," "sky trash," "litter on a stick," and "the junk mail of American roadways." Nothing can destroy the distinctive character of our communities and countryside more quickly or thoroughly than uncontrolled signs and billboards.

Signs in the public rights-of-way have been around for as long as there have been public rights-of-way, but the numbers have spiraled out of control in recent years. Between fields of “popsicle-stick” signs for homebuilders and politicians and signs for weight loss, work-at-home businesses, painting, hauling and other signs plastered on every available traffic sign and utility pole, everyone in Fairfax County has something to hate about the proliferation of signs.

Communities can regain control of their visual environment, preserve their distinctive character and protect natural beauty and the environment by enacting and enforcing ordinances that control signage and billboards. Reducing sign and billboard blight helps communities reclaim local beauty and character. Excellent alternatives to large intrusive signs and billboards, such as wayfinding signs, logo signs and tourist-oriented directional signs, can help people locate local businesses and are minimal in their visual impact.

C. TELECOMMUNICATION TOWERS AND UTILITY TRANSMISSION LINES

In 1996, Congress passed the landmark Federal Telecommunications Act to encourage the rapid development and growth of new telecommunications technology such as wireless telephones and digital television. However, antenna towers, often of considerable height, have been built near people's homes, next to historic buildings, or in rural, scenic areas. Towering above trees, neighborhoods and protruding into the skyline, such towers often have a very unappealing visual impact (see the Web site www.scenic.org for examples). Reconciling the requirements of communications engineering and community aesthetics is a difficult and growing problem but one that must be directly addressed if both needs are to be properly served.

The visual blight associated with above ground utility lines besets both our residential and commercial areas. These lines and poles are particularly objectionable in our local shopping areas where they obstruct the vision of drivers and greatly impair the visual attractiveness of the locale.

D. ADDRESSING THE PROBLEM

Creating sign regulations developed with community input encourages business owners to erect less intrusive signs that reflect an area's spirit, contributing to civic pride and helping to revitalize commercial districts. Regulations should encourage signs that quickly communicate their message, complement their surroundings and enhance the visual character of the community. Attractive on-premise signs can help encourage residents and business owners to work together to improve and revitalize local appearance.

The Fairfax County Zoning Ordinance, Article 12, deals with signs and signage regulations. It deals comprehensively and at length with permitted and non-permitted signage and what kind of sign needs a permit versus signage not requiring a permit. **The ordinance appears to cover the subject thoroughly, but the fact that impermissible signage is overabundant indicates that enforcement is lacking and perhaps that county staff functions are not organized in a way that could provide cost effective enforcement.** In addition, the ordinance has a significant shortcoming in Article 12, in that there is no explicit provision therein for civil penalties (i.e., fines) for failure to obey it. Rather, it relies on Article 18-903.1.H and I to deal with Infractions and Civil Penalties. However, these two provisions deal only with Sections 12-301 and parts of 12-104. Thus, the entirety of Sections 102, 103 and part of Section 104 are not addressed. This is very important, since adequate civil penalties can readily pay for an effective enforcement program.

The other key component of an effective enforcement program is the requisite political will on the part of the Board of Supervisors. It is a given that the well-organized real estate and development industries will vigorously resist any enforcement

program that would impose limits, no matter how reasonable, on their current practice of often excessive and obtrusive signage. The many small business enterprises that litter the roadsides and telephone poles with illegally placed signs will complain that enforcement will deprive them of livelihoods. Finally, political campaign signage, in which the lawmakers themselves have a vested interest, is a sensitive issue despite recognition of the current abusive practices.

The Board of Supervisors initiated the Fairfax County Sign Task Force in August, 2000. In September, 2001, the Task Force issued its report, *“Illegal Signs in the Right of Way”* which:

- Examined current Fairfax County practices and enforcement procedures regarding signs within and along the roadways
- Evaluated other jurisdictions’ best practices in dealing with illegal signs
- Recommended amendments to the county’s sign ordinance and suggested new legislative approaches to address this problem.

Thus far the report and its recommendations have met with inaction.

Communities can do much to regulate the height, number and location of wireless telecommunication towers by enacting strong ordinances. Without good ordinances, communities are at the whim of telecommunication companies that avidly seek sites for towers and property owners who may willingly lease land for a tower. Fairfax County recently prevailed at the Virginia Supreme Court in a decision that required VDOT to reasonably comply with the Fairfax County Zoning Ordinance in siting monopole towers in the VDOT right-of-way within Fairfax County.

E. PUBLIC AGENCY RESPONSIBILITIES

The Sign Task Force concluded that there is no one agency within the county government that is devoted to removing impermissible signs or prosecuting persons who erect the signs in violation of the law. The Task Force concluded that cleanup efforts are inadequate unless a county official receives complaints or VDOT receives complaints. Therefore, it appears that what little effort there is to remove signs is reactive rather than proactive. Some neighboring communities assign specific persons to this job, but Fairfax County does not have such a system. In fact, Zoning Inspectors do have authority delegated to them from VDOT to remove illegal signs. However, on many occasions when county inspectors have removed signs (e.g., on a Friday afternoon), they are back up by Monday morning or sooner.

The ordinance needs to be changed to empower the citizenry to take action, but this would be facilitated by State enabling legislation. Good citizens attempting to help the county by removing signs themselves are not clearly authorized to do so; therefore, they are inviting a liability action when they do remove signs. At present, about the only way the ordinary citizen can be involved with removing signs without some risk of liability action is through

the VDOT Adopt-a-Road Program. In this program, a group agrees to become responsible for keeping a stretch of roadside cleaned of debris and litter and is, in effect, deputized with authority to remove impermissibly placed signs along with other litter. However, this program applies only to VDOT rights-of-way. A comparable program is needed with respect to utility poles which are most often placed within easements.

F. COMMENTS

Given that the Zoning Enforcement staff is heavily loaded with other duties, such as the special strike force for housing violations, in addition to its regular work, it may be worth exploring whether it is feasible to contract out the mechanics of an enforcement effort to reduce, or hopefully eliminate, the prevalence of illegal signs. The enforcement effort might well be paid for by the collection of fines for the violations. This would eliminate the need for hiring permanent staff, and the contracted effort could be reduced as the illegal signage diminishes in volume.

G. RECOMMENDATIONS

1. EQAC recommends that the county continue negotiations with the commonwealth to enable the county to remove signs from the VDOT right-of-way and to enforce limitations and restrictions on such signage in the same manner as though the signs were covered under the Fairfax County ordinances, including the application of civil penalties.
2. EQAC recommends that the lack of an explicit provision within Article 12-300 of the present ordinance for assessment of civil penalties be rectified at the earliest opportunity. It is recommended that Article 18-903 of the ordinance be amended by deleting items 1.H and 1.I. These provisions should be replaced by new, more comprehensive, language built directly into Article 12. (See Addendum 1 for suggested text.) It is further recommended that the modified ordinance be used in much the same manner as is done by the Department of Public Works and Environmental Services with its “Letter to Industry.” When an illegally posted sign is observed by an inspector, or reported by a resident, such a letter, containing the text of the ordinance, including the penalties clause, could be sent to the offending party as a means of strongly discouraging continuance or repetition of the violation.

ADDENDUM 1

Suggested text for a subsection on civil penalties for the Sign Ordinance

PART 4 12-400 VIOLATIONS, INFRACTIONS, AND PENALTIES

12-401 General provisions

1. Any sign erected, placed, or affixed contrary to any of the provisions of this Article or contrary to any provisions of any permit issued under this Article shall be, and is hereby declared to be, unlawful.
2. Any person (whether owner, officer, lessee, principal, agent, employee or otherwise), corporation, or organization who violates any of the provisions of this Article, or permits such violation, or fails to comply with any of the requirements hereof shall be subject to the enforcement provisions of this Part.
3. Upon becoming aware of any violation of any provision of this Article, the Zoning Administrator shall serve notice of such violation on the person committing or permitting the same, which notice shall require the violation to cease within such reasonable time as is specified in the notice. After such notice is sent and such violation is not ceased within such reasonable time as is specified in the notice, then the Zoning Administrator may proceed to remedy the violation as provided in Section 402 below. The Zoning Administrator may also revoke a residential or non-residential use permit to terminate the violation. Any written notice of the Zoning Administrator shall include a statement informing the recipient that a right to appeal the notice of a zoning violation or a written order within thirty days may exist in accordance with Sect. 15.2-2311 of the Code of Virginia and Part 3 of Article 18 of the Zoning Ordinance, and that the decision shall be final and unappealable if not appealed within thirty days. The appeal period shall not commence until such statement is given.
4. In addition to the remedies provided in Par. 3 above, the Zoning Administrator may initiate injunction, mandamus, or any other appropriate action to prevent, enjoin, abate, or remove such erection, placement, or affixation in violation of any provision of this Article. Such action may also be instituted by any person who may be aggrieved or particularly damaged by any violation of any provisions of this Article.

12-402 Infractions and Civil Penalties

1. A violation of the provisions of this Article shall be deemed an infraction and shall be punishable by a civil penalty of \$100 for the first violation at a specific location; any subsequent violations at the same location arising from the same set of operative facts shall be punishable by a civil penalty of \$250 for each separate offense. Any violation arising from the same set of operative facts at the same location which persists for sixty (60) days or more may, at the discretion of the Zoning Administrator, thereafter be subject to injunction, mandamus, or any other appropriate action to prevent, enjoin, abate, or remove such violation.
2. Each day during which any violation of the provisions of this Article is found to have existed at the same location shall constitute a separate offense. However, in no event shall any such violation arising from the same set of operative facts at the same location be charged more frequently than once in any ten day period, nor shall a series of such violations arising from the same set of operative facts at the same location result in civil penalties which exceed a total of \$5000.
3. The designation of a particular violation of this Article at a particular location as an infraction pursuant to Par. 1 above shall be in lieu of criminal sanctions except for any violation resulting in injury to any person or persons.
4. After having served a notice of violation on any person committing or permitting a violation of the Zoning Ordinance provisions enumerated in this Article and if such violation has not ceased within such reasonable time as is specified in such notice, then, upon the approval of the County Attorney, the Zoning Administrator shall cause two (2) copies of a summons to be served upon such person.
5. Such summons shall contain the following information:
 - A. The name and address of the person, corporation or organization charged.
 - B. The nature of the infraction and the Ordinance provision(s) being violated.
 - C. The location, date, and time that the infraction occurred or was observed.

- D. The amount of the civil penalty assessed for the infraction.
 - E. The manner, location, and time in which the civil penalty may be paid to the County.
 - F. The right of the recipient of the summons to elect to stand trial for the infraction and the date for such trial.
6. The summons shall provide that any person, corporation, or organization summoned for a violation may elect to pay the civil penalty by making an appearance in person or in writing by mail to the Department of Finance at least seventy-two (72) hours prior to the time and date fixed for the trial and, by such appearance, may enter a waiver of trial, admit liability, and pay the civil penalty established for the offense charged. Such summons shall provide that the signature to an admission of liability shall have the same force and effect as a judgment of court, however, an admission shall not be deemed a criminal conviction for any purpose.
7. If a person, corporation, or organization charged with a violation does not elect to enter a waiver of trial and admit liability, the violation shall be tried in the General District Court in the same manner and with the same right of appeal as provided by law. A finding of liability shall not be deemed a criminal conviction for any purpose.
8. The remedies provided for in this section are cumulative and not exclusive and shall be in addition to any other remedies provided by law.

NOISE, LIGHT POLLUTION AND VISUAL POLLUTION: SUMMARY OF RECOMMENDATIONS

Noise

1. In recognition of the anticipated opening of a new fourth runway at Washington Dulles International Airport in late 2008 and the future construction of a fifth runway, EQAC recommends that the Board of Supervisors formally request the Metropolitan Washington Airports Authority and the Federal Aviation Administration to evaluate options for the operation of the existing and new runways to identify approaches that will optimize flight operations in a manner that minimizes community noise exposure. This evaluation should include both an assessment of 24-hour noise monitoring and an analysis of operational approaches. The evaluation of noise impacts should begin at the time the first of the new runways is opened for use and should continue in perpetuity, especially through the time period incorporating one year beyond the reopening of any runway that is taken out of service for maintenance. The results of all such noise evaluations should be reported quarterly and should be provided to a number of stakeholders including the Fairfax County Board of Supervisors, EQAC and relevant county staff.
2. EQAC is pleased that a series of Web pages have been established on the county's Web site addressing noise issues. The county should ensure that this page is kept current through regular updates.

Light Pollution

1. EQAC recommends that the Board of Supervisors direct the Department of Planning and Zoning to move ahead as rapidly as possible on revisions to the Outdoor Lighting Ordinance. The revisions need to address glare and several minor issues.
2. EQAC recommends that the Board of Supervisors designate EQAC to work with the Fairfax County Park Authority to review and fine tune its specifications for athletic field lighting to correct the current deficiencies, including but not necessarily limited to:
 - Treatment of glare (as opposed to surface illumination)
 - Hardware specifications that may be overly restrictive or inappropriate or that give the appearance being selective for a particular manufacturer or supplier
 - Explanatory documentation for public consumption, particularly that posted on the Web site, to ensure scientific accuracy and understandability of subject matter

Visual Pollution

1. EQAC recommends that the county continue negotiations with the commonwealth to enable the county to remove signs from the VDOT right-of-way and to enforce limitations and restrictions on such signage in the same manner as though the signs were covered under the Fairfax County ordinances, including the application of civil penalties.

2. EQAC recommends that the lack of an explicit provision within Article 12-300 of the present ordinance for assessment of civil penalties be rectified at the earliest opportunity. It is recommended that Article 18-903 of the ordinance be amended by deleting items 1.H and 1.I. These provisions should be replaced by new, more comprehensive, language built directly into Article 12. (See Addendum 1, provided earlier in this chapter, for suggested text.) It is further recommended that the modified ordinance be used in much the same manner as is done by the Department of Public Works and Environmental Services with its “Letter to Industry.” When an illegally posted sign is observed by an inspector, or reported by a resident, such a letter, containing the text of the ordinance, including the penalties clause, could be sent to the offending party as a means of strongly discouraging continuance or repetition of the violation.

APPENDIX A

SUMMARY OF ENVIRONMENTAL BILLS OF INTEREST 2008 VIRGINIA GENERAL ASSEMBLY

Each year, the Virginia General Assembly considers scores of bills that could impact the environment and conservation efforts in the commonwealth. This appendix identifies and summarizes several such bills that were considered by the General Assembly in 2008 and indicates whether they “Passed,” “Failed” or were “Carried Over.” For the most part, the summaries are from the Virginia General Assembly Legislative Information System. By going to the LIS Web site (<http://leg1.state.va.us/>), the entire bill as well as its history and patrons can be reviewed. Unless otherwise noted, the summaries provided below describe the bill as originally submitted. Because bills are frequently amended, reference should be made to the LIS web site for final language of bills of interest.

Senate Bills

SB43 Environmental impact reports; highway projects. Requires an environmental impact report in connection with a local highway construction, reconstruction, or improvement project only when such a project is estimated to cost more than \$1 million. The current threshold amount requiring such a report is \$100,000. This bill is identical to HB 1259. **PASSED.**

SB234 Greenhouse gas emissions; mandatory reporting. Requires that the State Air Pollution Control Board adopt regulations requiring the reporting of greenhouse gas emissions from stationary sources. The regulations would apply only to those sources that emit more than a de minimis amount of greenhouse gas and that are already required to report emissions of other air pollutants. To the extent possible, reporting requirements will incorporate standards and protocols developed by other widely recognized and verified greenhouse gas inventory programs. Beginning in 2009, the Virginia Department of Transportation is required to provide the Department of Environmental Quality with data necessary to maintain a greenhouse gas emissions inventory for individual road segments throughout the Commonwealth. The Board is also authorized to establish a voluntary program allowing persons to register voluntary reductions in direct or indirect emissions of greenhouse gases. The voluntary program may include the reporting of reductions in emissions from motor vehicle fleets owned by persons otherwise required to report emissions from stationary sources. **FAILED.**

SB321 Environmental impact of renewable energy electric generating facilities. Requires the Department of Environmental Quality to consult with other state agencies that have expertise in natural resource management when considering the cumulative impact of new and proposed renewable energy electric generating facilities. Along with such other agencies, the Department

will develop a coordinated recommendation to submit to the State Corporation Commission specifying any mitigation measures and additional site-specific studies. **PASSED.**

SB386 Application of the Chesapeake Bay Preservation Act. Redefines the localities that are under the jurisdiction of the Chesapeake Bay Preservation Act (CBPA). Currently, the CBPA applies to specifically named counties and cities that are defined as being located within Tidewater Virginia. The bill changes the definition of which localities constitute Tidewater Virginia to include only those localities wholly east of Interstate 95. Because the definition of Tidewater Virginia in the CBPA also appears in the stormwater law, to ensure that there is no change in the coverage of the stormwater program, the counties and cities currently listed in the CBPA's definition of Tidewater are delineated in the stormwater law. **FAILED.**

SB423 Air and Water Boards permit issuance process. Establishes a uniform permit issuance process for the Air Pollution Control Board (Air Board) and the State Water Control Board (Water Board). After issuing a public notice of a pending permit action, if at least 25 individuals have requested a public hearing and the Director finds that the issues raised are germane to the permit action and are not inconsistent with state or federal laws, a public hearing will be held. The Director or the two Boards may convene a meeting under an expedited schedule to reconsider the decision of the Director to grant a public hearing. The meeting may be held electronically if one public forum is available. The Board is required to act on the permit within 90 days of the close of the comment period unless the applicant agrees to an extension of the time period. Persons who commented during the public hearing may address the Air and Water Boards at the meeting where final action on the permit will occur. The Board's decision shall contain a written basis for its decision. The bill also increases membership on the Air Pollution Control Board from five to seven members. However, the two new members are prohibited from voting on any action related to a permit that is under consideration as of January 1, 2008. A qualification of the Air Board members is changed so that no member can be a current employee of an entity subject to a permit or enforcement order of the Air Board. Currently, a majority of the members appointed to the Air Board can represent the public interest and not derive any significant positions of their income from entities subject to permit or enforcement actions. The qualifications of the membership of the Water Board and the Virginia Waste Management Board are changed to require that the members, by their education, training, or experience, be knowledgeable of water quality or waste management, respectively, and shall be fairly representative of conservation, public health, business, and agriculture. This bill is identical to HB 1332. **PASSED.**

SB470 Natural resources funding. Provides annual funding for natural resources from (i) 20 percent of the remaining revenues of state recordation taxes that are not currently allocated and (ii) unallocated land preservation tax credits in each calendar year. Of the revenues allocated to natural resources, 17 percent would be used to provide matching grants to local purchase of development rights programs, 16 percent would be distributed to the Virginia Land Conservation Fund, and 67 percent would be distributed to the Agricultural Best Management Practices Cost-Share Program for agricultural best management practices. For the moneys allocated to agricultural best management practices, five percent would be distributed to soil and water conservation districts to provide technical assistance for the implementation of agricultural best management practices. The remaining moneys would be used for matching grants for

agricultural best management practices, with 60 percent of the moneys used for lands exclusively in the Chesapeake Bay watershed and 40 percent of the moneys used for all other lands in the Commonwealth. For the moneys allocated to provide matching grants to local purchase of development rights programs, 60 percent of the moneys would be used for grants for local purchase of the development rights programs of counties and cities wholly or partly within the Chesapeake Bay watershed and 40 percent of the moneys would be used for grants for local purchase of the development rights programs of all other counties and cities. In general, for each \$1 received, the local purchase of development rights program would be required to provide a \$1 match. **CARRIED OVER.**

SB511 Natural resources funding. Establishes the Virginia Natural Resources Commitment Fund. The Fund would be capitalized with appropriated funds and moneys from public and private sources. Beginning July 1, 2008, and for the next 10 years moneys in the Fund would be distributed to the Department of Conservation and Recreation's Agricultural Best Management Practices Cost-Share Program for the implementation of agricultural best management practices (BMP). Fifty-seven percent of the moneys are to be used for matching grants to implement BMPs on agricultural lands exclusively in the Chesapeake Bay watershed and 38 percent of the moneys would be used for all other lands in the Commonwealth. Five percent of the moneys would be allocated to soil and water conservation districts. This bill is identical to HB 1335. **PASSED.**

SB513 Nonpoint source reduction funding. Authorizes the Governor and General Assembly to provide additional funding in excess of the amount deposited in the Water Quality Improvement Fund from a budget surplus to fund nonpoint source pollution reduction activities. This bill is identical to HB 360. **PASSED.**

SB594 Dam safety. Exempts the owners of historically significant dams that do not present an imminent danger from having to correct deficiencies identified in a dam safety inspection conducted by the Department of Conservation and Recreation. **FAILED.**

SB648 Used motor oil, other fluids for automotive maintenance, and oil filters; statewide recycling program. Strengthens and broadens the current recycling program for used motor oil and used oil filters to include all automotive maintenance fluids and to require that the Department of Environmental Quality maintain a toll-free hotline number and website for consumers that choose to properly dispose of used motor oil, other fluids for automotive maintenance, and oil filters. **PASSED.**

SB679 Recovery of fire fighting costs by localities. Allows a locality to collect the costs for fighting or extinguishing a fire if the fire was set intentionally and the person who set the fire did not prevent the fire from escaping. Further states that any such person shall be liable for the full amount incurred by the locality and any volunteer fire or rescue squad for fighting or extinguishing the fire and any reasonable administrative costs expended to collect such expenses. Also allows a locality to recover costs, up to \$750, from a minor's parents for any fire suppression that is the result of malicious or willful conduct on the part of the minor. The Department of Forestry already has the authority to collect costs expended by the Commonwealth in such circumstances. **PASSED.**

SB690 Disbursements from Water Quality Improvement Fund. Authorizes the Department of Environmental Quality to reimburse localities for the costs of nutrient removal upgrades at publicly owned treatment works on a monthly basis so long as there is written certification from the grant recipient that the local share of the project costs has been expended. **PASSED.**

SB712 Cap and trade system for NO_x and SO₂; nonattainment areas. Provides that the Air Pollution Control Board may prohibit electric generating facilities located within specified nonattainment areas in the Commonwealth from meeting their compliance obligations for pollutants that contribute to ongoing nonattainment in that area through the purchase of allowances for NO_x and SO₂ only if the Board finds that: (i) the prohibition will directly and quantifiably reduce ambient concentrations of ozone or PM_{2.5} in the affected nonattainment area; and (ii) there is no other reasonably available approach to achieve a comparable air quality benefit for the Commonwealth. **CARRIED OVER.**

SB717 Fossil fuel combustion products permit. Requires a solid waste permit to authorize the placement of unamended coal combustion byproduct as structural fill in a 100-year flood plain. **FAILED.**

SB748 Alternative fuels; net emissions increase. Provides that no permit modifications, trial burns, or other demonstrations are required if the owner of an industrial burner chooses to replace residual oil with processed animal fat, processed fish oil, processed vegetable oil, distillate oil, or any mixture thereof in place of the same quantity of residual oil to fire industrial boilers. The Air Pollution Control Board is also required to adopt regulations containing certain provisions that clarify the process of emissions calculations under the minor new source program. **PASSED.**

SB752 Brownfields; public notice of voluntary remediation plans. Requires the Department of Environmental Quality to provide written notice of an application for a voluntary remediation plan to any person who owns a property that abuts or lies within 100 feet of the boundary lines of the subject property or who owns a property that is identified as contaminated by a release on the subject property. Notice must also be published in a newspaper of general circulation. A public comment period of at least 30 days shall follow the issuance of notice. **CARRIED OVER.**

House Bills

HB18 Department of Environmental Quality. Amends legislation passed during the 2007 Session of the General Assembly to consolidate the existing three citizen boards--the State Air Pollution Control Board, the State Water Control Board, and the Waste Management Board--into one 11-member citizen board. The existing three citizen boards would retain authority over any applications for permits and amendments pending before the end of 2007 until the earlier of the resolution of the application or June 30, 2010. **FAILED.**

HB19 Department of Environmental Quality. Repeals legislation passed during the 2007 Session of the General Assembly to consolidate the existing three citizen boards--the State Air

Pollution Control Board, the State Water Control Board, and the Waste Management Board--into one 11-member citizen board. **FAILED.**

HB260 Department of Conservation and Recreation. Allows the Department to acquire abandoned railroad corridors for use as greenways, linear parks, or potential transportation corridors. **FAILED.**

HB343 Cathode ray tubes; disposal bans. Permits localities to prohibit the disposal of cathode ray tubes in any waste-to-energy or solid waste disposal facility within its jurisdiction, provided the locality has implemented a recycling program that is capable of handling all cathode ray tubes generated within its jurisdiction. Previously the ban only applied to privately operated landfills. **PASSED.**

HB344 Computer Recovery and Recycling Act; penalties. Requires the manufacturer of more than 500 items of computer equipment to adopt and implement a recovery plan providing for the reasonably convenient collection, recycling, and reuse of computer equipment returned by a consumer in the Commonwealth. The manufacturer must also affix a permanent, readily visible label to the computer equipment with the manufacturer's brand before a manufacturer may offer computer equipment for sale in the Commonwealth. Examples of collection methods meeting the recovery plan requirements in this Act include (i) a system by which the consumer may return the computer equipment free of charge; (ii) a system using a physical collection site; or (iii) a system using collection events at which the consumer may return computer equipment. Each manufacturer must annually report on the weight of computer equipment collected, recycled, and reused during the preceding calendar year. **PASSED.**

HB360 Nonpoint source reduction funding. Authorizes the Governor and General Assembly to provide additional funding in excess of the amount deposited in the Water Quality Improvement Fund from a budget surplus to fund nonpoint source pollution reduction activities. This bill is identical to SB 513. **PASSED.**

HB392 Stormwater ordinance. Authorizes localities classified as MS4 stormwater localities to enact ordinances to enforce stormwater permits. The bill would give these localities the authority to seek civil charges and injunctive relief, and impose civil penalties. Any person who willingly and knowingly violates the ordinance would be subject to a criminal penalty of a Class 1 misdemeanor. **PASSED.**

HB514 Fossil fuel combustion products permit. Requires any applicant seeking approval for the use of fossil fuel combustion products as structural fill to (i) publish a notice of his intent to apply for approval for the project from the Department of Environmental Quality (DEQ), (ii) hold a public meeting to answer citizen's questions, and (iii) submit minutes of the meeting to DEQ. The DEQ is not to issue the permit until the applicant has fulfilled these requirements. **FAILED.**

HB528 Chesapeake Bay ordinance appeals. Allows localities subject to the Chesapeake Bay Preservation Act to adopt an ordinance that establishes a time limit of at least 30 days for an aggrieved party to appeal a decision of the local board to the circuit court. **PASSED.**

HB643 Air emissions from major stationary sources. Requires operators of major stationary sources of air pollution that have facilities (i) whose stacks do not meet good engineering practices and (ii) emit one or more of the criteria pollutants, to demonstrate compliance with all National Ambient Air Quality Standards (NAAQS) by December 31, 2008. If this deadline is not met, then by July 1, 2009, the Department of Environmental Quality shall issue only a permit that ensures modeled compliance with all NAAQS. **FAILED.**

HB650 Department of Environmental Quality; authority of citizen boards. Provides that the Air Pollution Control Board and the State Water Control Board may delegate their authority to make permitting decisions to the Director of the Department of Environmental Quality (the authority to issue permits related to waste management is already vested with the Director). Either Board has the discretion to make a final permitting decision if it finds significant public interest in the permit, substantial and disputed issues within the scope of the Board's statutory authority, and that the time required for a public hearing and decision by the Board would not create an unreasonable delay. The membership of all three citizen environmental boards would also be reconfigured so that the membership of each board--the Air Pollution Control Board, the State Water Control Board, and the Virginia Waste Management Board--includes at least one member from the other two boards. **FAILED.**

HB837 Dam break inundation zones. Provides localities with the authority to address development in dam break inundation zones. The bill directs developers to assist dam owners with required upgrades and requires additional disclosure and notification procedures for dam owners. The bill contains an enactment clause that specifies that the bill's provisions do not affect site plans or subdivision plans submitted prior to the effective date of the act. **PASSED.**

HB1083 Submission of environmental impact report on major state projects. Exempts counties, cities, and towns from submission of environmental impact reports on highway construction, reconstruction, and improvement projects estimated to cost more than \$1 million. This bill was incorporated into HB 1259. **FAILED.**

HB1115 Payment for forest protection. Increases the annual amount a locality pays to the State Forester to provide forest fire protection, detection, prevention, and suppression. Beginning July 1, 2008, the amount localities will pay for such services will increase from the current five cents per acre to seven cents per acre and starting July 1, 2009, the payments will increase to nine cents per acre. **PASSED.**

HB1116 Environmental impact reports. Requires an environmental impact report be done for any major state construction project that will cost \$500,000 or more. The current threshold amount requiring such a report is \$100,000. **PASSED.**

HB1142 Virginia Recreational Facilities Authority. Delays the reversion of title to real property from the Virginia Recreational Facilities Authority to the Commonwealth, in the event that the Authority ceases to operate a project, until July 1, 2009. This bill contains an emergency clause. **PASSED.**

HB1214 Sale of trees from state-owned forests. Increases to \$50,000 the minimum threshold at which public bidding is required for sales of trees taken from state forests. Currently, the State Forester is required to solicit bids if the underlying value of the trees is greater than from \$10,000. **PASSED.**

HB1230 Greenhouse gas emissions; mandatory reporting. Requires that the State Air Pollution Control Board adopt regulations requiring the reporting of greenhouse gas emissions from stationary sources. The regulations would apply only to those sources that emit more than a de minimis amount of greenhouse gas and that are already required to report emissions of other air pollutants. The Board is also authorized to adopt regulations that require those same parties to report greenhouse gas emissions from fleets of motor vehicles. Beginning in 2008, the Virginia Department of Transportation is required to provide the Department of Environmental Quality with data necessary to maintain a greenhouse gas emissions inventory for individual road segments throughout the Commonwealth. **FAILED.**

HB1259 Environmental impact reports; highway projects. Requires an environmental impact report in connection with a local highway construction, reconstruction, or improvement project only when such a project is estimated to cost more than \$1 million. The current threshold amount requiring such a report is \$100,000. This bill incorporates HB 1083. This bill is identical to SB 43. **PASSED.**

HB1332 Air and Water Boards permit issuance process. Establishes a uniform permit issuance process for the Air Pollution Control Board (Air Board) and the State Water Control Board (Water Board). After issuing a public notice of a pending permit action, if at least 25 individuals have requested a public hearing and the Director finds that the issues raised are germane to the permit action and are not inconsistent with state or federal laws, a public hearing will be held. The Director or the two Boards may convene a meeting under an expedited schedule to reconsider the decision of the Director to grant a public hearing. The meeting may be held electronically if one public forum is available. The Board is required to act on the permit within 90 days of the close of the comment period unless the applicant agrees to an extension of the time period. Persons who commented during the public hearing may address the Air and Water Boards at the meeting where final action on the permit will occur. The Board's decision shall contain a written basis for its decision. The bill also increases membership on the Air Pollution Control Board from five to seven members. However, the two new members are prohibited from voting on any action related to a permit that is under consideration as of January 1, 2008. A qualification of the Air Board members is changed so that no member can be a current employee of an entity subject to a permit or enforcement order of the Air Board. Currently, a majority of the members appointed to the Air Board can represent the public interest and not derive any significant positions of their income from entities subject to permit or enforcement actions. The qualifications of the membership of the Water Board and the Virginia Waste Management Board are changed to require that the members, by their education, training, or experience, be knowledgeable of water quality or waste management, respectively, and shall be fairly representative of conservation, public health, business, and agriculture. This bill is identical to SB 423. **PASSED.**

HB1335 Natural resources funding. Establishes the Virginia Natural Resources Commitment Fund. The Fund would be capitalized with appropriated funds and moneys from public and private sources. Beginning July 1, 2008, and for the next 10 years, moneys in the Fund would be distributed to the Department of Conservation and Recreation's Agricultural Best Management Practices Cost-Share Program for the implementation of agricultural best management practices (BMP). Fifty-seven percent of the moneys are to be used for matching grants to implement BMPs on agricultural lands exclusively in the Chesapeake Bay watershed and 38 percent of the moneys would be used for all other lands in the Commonwealth. Five percent of the moneys would be allocated to soil and water conservation districts. This bill is identical to SB 511. **PASSED.**

HB1408 Eligibility for betterment loans. Directs the Board of Health and the Director of the Department of Environmental Quality to develop procedures for qualifying the owners of failing septic tanks, underground storage tanks, and contaminated dry cleaning stores, for betterment loans to be provided by private lenders. **FAILED.**

HB1443 Streamlined permitting process for alternative and renewable energy facilities. Requires the Air Pollution Control Board to develop procedures for the expedited review of applications for the construction of a qualified energy generator. The expedited procedures cap the permit fees at \$50 and require processing of an application to be completed within 60 days. A qualified energy generator is a commercial facility located in the Commonwealth with the capacity annually to generate not more than five megawatts of electricity, or its equivalent in fuel, steam, or other form of energy, that is generated or produced from biomass. The measure does not apply to facilities that are subject to a major new source review program required by the federal Clean Air Act. **PASSED.**

HB1466 Environmental impact of renewable energy electric generating facilities. Requires the Department of Environmental Quality to evaluate information provided by state agencies with expertise in natural resource management regarding the potential environmental impacts of a proposed renewable energy electric generating facility. The Department is required to coordinate the development of consensus recommendations to address the facility's potential adverse environmental impacts. The recommendations shall identify specific measures, including additional site studies, to mitigate or minimize these adverse environment impacts. **FAILED.**

HB1533 Television recycling programs; manufacturer fees; disposal ban. Bans the disposal of covered televisions and component parts as solid waste effective January 1, 2009. The bill requires manufacturers of televisions covered by the act to pay a \$5,000 per year state registration fee and report to the Department of Environmental Quality on the weight, in pounds, of televisions sold in the Commonwealth. The Department will use the fees collected to provide reimbursements to localities implementing television recycling programs in compliance with criteria established by the Department. If a locality does not implement a television recycling program, the Department shall initiate a program for residents in that locality. Both the Department and the Office of the Attorney General have authority to enforce the provisions of this act. **CARRIED OVER.**

HB1548 Recyclable construction and demolition debris. Prohibits publicly owned landfills from accepting three or more tons of construction and demolition debris per hauler trip if there are recycling facilities available in the area or there is a construction and demolition landfill in the area. **CARRIED OVER.**

HB1549 Recycling glass containers. Requires all "on-premises" licensees of the Virginia Alcoholic Beverage Control Board to recycle their glass containers, if the locality in which they are located is within 50 miles of a recycling center. A \$50 civil penalty is assessed on anyone who violates this requirement. **FAILED.**

HB1552 Erosion and sediment control plan. Allows any person creating and operating stream restoration banks in more than one jurisdiction to file general erosion and sediment control specifications for stream restoration banks annually with the Virginia Soil and Water Conservation Board. **PASSED.**

HB1567 Nonpoint source pollution; commercial lawn care providers. Expands an existing training program for nutrient management training to include a voluntary program for commercial providers of lawn care or landscaping services to reduce nonpoint source pollution. Businesses that employ at least one individual trained and certified under a nutrient management program are eligible to receive a "Friend of the Bay Award." **CARRIED OVER.**

<http://dls.state.va.us/pubs/summary/2008/sessumtc.htm>

APPENDIX B

EQAC RESOLUTIONS AND POSITIONS NOVEMBER 2007 THROUGH OCTOBER 2008

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<u>Date</u>	<u>Resolution/Position</u>	<u>Page</u>
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County of Fairfax, Virginia

MEMORANDUM

DATE: November 7, 2007

TO: Planning Commission

FROM: Stella Koch, Chairman *Stella M. Koch*
Environmental Quality Advisory Council

SUBJECT: EQAC comments on Green Buildings

We thank the Planning Commission for Comprehensive Plan language that is a good start for encouraging Green Buildings throughout Fairfax County.

We commend you for choosing and agree that the LEED rating system is the appropriate standard to use.

We urge that there be additional measures taken to incentivize Silver, Gold and Platinum LEED certification in Transit Oriented Development areas and that language should be put in the appropriate Area Plans to reflect these goals.

We suggest the following measures to be considered as incentives outside the scope of the proposed Comprehensive Plans changes that would facilitate higher levels of Green Building in TOD or transit areas, to include:

- 1) permit rebates
- 2) tax incentives for energy efficient buildings as rates under LEED or Energy Star Ratings
- 3) density bonuses similar to Arlington of increased FARs as one moves from Silver to Gold to Platinum levels

We also ask that you consider implementing a Green Building Fund that provides you the cash you need to have dedicated staff and is refunded if a building achieves certification.

We thank you for this opportunity to comment and look forward to working with you on this issue in the future.

SMK:nhk

cc: Board of Supervisors
Anthony H. Griffin, County Executive
Robert A. Stalzer, Deputy County Executive
Kambiz Agazi, Fairfax County Environmental Coordinator
Environmental Quality Advisory Council file: November 2007



County of Fairfax, Virginia

MEMORANDUM

DATE: November 30, 2007

TO: Board of Supervisors

FROM: Stella Koch, Chairman *Stella M. Koch*
Environmental Quality Advisory Council

SUBJECT: EQAC comments on Green Buildings

In regard to the December 3 public hearing on the proposed Plan amendment addressing air quality and green building issues (S07-CW-3CP), I wish to reiterate comments that I transmitted on behalf of EQAC to the Planning Commission in regard to this matter.

We thank the Board of Supervisors for Comprehensive Plan language that is a good start for encouraging Green Buildings throughout Fairfax County.

We commend you for choosing and agree that the LEED rating system is the appropriate standard to use.

We urge that there be additional measures taken to incentivize Silver, Gold and Platinum LEED certification in Transit Oriented Development areas and that language should be put in the appropriate Area Plans to reflect these goals.

We suggest the following measures to be considered as incentives outside the scope of the proposed Comprehensive Plans changes that would facilitate higher levels of Green Building in TOD or transit areas, to include:

- 1) permit rebates
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- 3) density bonuses similar to Arlington of increased FARs as one moves from Silver to Gold to Platinum levels

We also ask that you consider implementing a Green Building Fund that provides you the cash you need to have dedicated staff and is refunded if a building achieves certification.

We thank you for this opportunity to comment and look forward to working with you on this issue in the future.

SMK:nhk

cc: Anthony H. Griffin, County Executive
Robert A. Stalzer, Deputy County Executive
Kambiz Agazi, Fairfax County Environmental Coordinator
Environmental Quality Advisory Council file: November 2007

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution on Revision of Outdoor Lighting Ordinance

December 11, 2007

Whereas, a new Outdoor Lighting Ordinance was adopted by the Board of Supervisors in 2003; and

Whereas, the new ordinance and its 16 page explanatory guidebook won accolades as being one of the best of its kind in the mid-Atlantic region; and

Whereas, it was recognized at the time of adoption that the ordinance would require revisions and/or additions as experience revealed omissions or inadequacies in its provisions; and

Whereas, EQAC has noted in the recommendations of its last three Annual Reports on the Environment the need for such revisions and additions and has recommended to the Board that work on drafting the language for them begin immediately; and

Whereas, the Department of Planning and Zoning has recently advanced this task from “Priority 2” status to “Priority 1” status in its work plan; and

Whereas, discussions between the EQAC “point person” on this issue and the DPZ counterpart indicate that most of the items needing attention are well understood and it should be a relatively simple and straightforward process to draft suitable language for those revisions and additions even though one or two items may be more complex and require more analysis; now therefore

Be it resolved, that EQAC urgently requests the Board of Supervisors to direct the Department of Planning and Zoning to pursue these ordinance revisions with all deliberate dispatch and be able to present a revision package to the Board for its approval at an early date.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution on County Capital Facilities Projects

January 9, 2008

Whereas, in early December county staff briefed the Board of Supervisors Environment Committee on LEED/green building concepts that it plans to introduce into new county capital facilities projects; and

Whereas, green buildings and LEED principles are almost entirely concerned with the building design itself and only minimally with the site; and

Whereas, the Board has recently approved six low impact development (LID) methods for inclusion in the PFM, and county staff, in partnership with the Northern Virginia Regional Commission, is developing an LID supplement to the Northern Virginia Best Management Practices (BMP) handbook which will be considered in the future for adoption, and within which five or six additional LID methods are being considered; and

Whereas, LID methods are almost entirely concerned with design and treatment of the site exclusive of buildings, particularly with the management of stormwater; and

Whereas, the Board has been very receptive to the recommendations of the Tree Commission for preservation of trees and preservation and increase of tree cover on sites subject to development; and

Whereas, as commendable as are these three broad goals individually, there are few county capital facilities projects underway or in the planning stages that adequately integrate the principles embodied in them in the designs; and

Whereas, if the county wishes to have these practices broadly adopted and utilized by the development community it must become the exemplar for them in its own facilities; now therefore

Be it resolved, that EQAC strongly urges the Board of Supervisors to mandate fully integrated application of green buildings, LEED, LID, and tree preservation practices to all of its capital facilities in the planning stages; and

Be it further resolved, that insofar as possible construction plans for capital facilities already in advanced stages of design or under construction be revised to include use of these technologies; and

Be it finally resolved, that LEED Silver certification should be adopted as the county goal for its new capital facilities, and that the County should strive for LEED Gold certification where practical.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution on Sign Regulations

January 9, 2008

Whereas, the Board of Supervisors several years ago appointed a special ad hoc task force to recommend actions to control the proliferation of visually objectionable signage in the county; and

Whereas, some two years later the task force was re-empanelled to again examine the issue and present its recommendations; and

Whereas, in its last several Annual Reports on the Environment EQAC has strongly recommended adoption of and action on the recommendations of the taskforce as well as proposing several additional specific actions; and

Whereas, to date no action has been taken to implement any of these various recommendations; and

Whereas, there have been recent negotiations between the county and VDOT that could lead to an agreement broadly empowering the county to remove or sanction signage illegally placed in VDOT rights-of-way; and

Whereas, the county already has the power to remove and/or sanction signs that are posted outside of the VDOT rights-of-way; now therefore

Be it resolved, that EQAC urgently requests the Board of Supervisors to initiate action to adopt the earlier task force and EQAC recommendations and to incorporate them, as appropriate, into the Ordinances governing the county, and

Be it further resolved, that the negotiations with VDOT regarding empowerment of the county to deal vigorously with improperly placed signage in VDOT rights-of-way be brought to an early and successful conclusion; and

Be it finally resolved, that EQAC believes rigorous application of civil penalties will lead to better compliance with enacted ordinances.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution on the Wildlife Management Program

January 9, 2008

Whereas, as a result of recommendations by EQAC and the Deer Management Committee (formed in 1999 within the County Executive's office), the Wildlife Management Program, under the leadership of the County Wildlife Biologist, was implemented in 1999 and 2000; and

Whereas, the County Wildlife Biologist role was envisioned as somewhat like that of the Environmental Coordinator, i.e., as a function that could interact broadly with a variety of county and outside agencies to address and provide leadership for implementation of program goals, including major interactions with, among others, Fairfax County Park Authority, Northern Virginia Regional Park Authority, Fairfax County Health Department, Virginia Department of Game and Inland Fisheries, Virginia Department of Natural Resources, U.S. National Park Service, U.S. Department of Agriculture, U.S. Fish and Wildlife Service; and

Whereas, sometime later the program was placed within the Police Department Patrol Bureau apparently because that is where the Animal Control Section is located, and various additional functions have been incorporated such as the goose program; and

Whereas, the only real operational interaction of the Wildlife Management Program with the Fairfax County Police Department is with the Special Operations Tactical Team in the Operations Support Bureau which supplies sharpshooters for deer-herd culling operations in county parks; and

Whereas, the recent reorganization of the Animal Services Division of the Police Department has further impaired the ability of the Wildlife Management Program to function as intended; and

Whereas, the most appropriate location for the Wildlife Management Program would be somewhere within the Office of the County Executive with the County Wildlife Biologist as program manager, where its broad coordinative functions could be most effectively performed, while an alternate, but less desirable possibility, would be as part of the Park Authority's Resource Management Division; now therefore

Be it resolved, that EQAC finds the current organizational arrangement significantly impairs the ability to effectively conduct the Wildlife Management Program and believes that the program functions and personnel should be relocated elsewhere in the county structure and at a level consistent with the broad range of required coordinative functions; and

Be it further resolved, that EQAC requests that the County Auditor retrieve and inventory all equipment purchased on the budget of the Wildlife Management Program so that it can be relocated along with the personnel and operational functions.



County of Fairfax, Virginia

MEMORANDUM

DATE: January 9, 2008

TO: Board of Supervisors
FROM: Stella Koch, Chairman *Stella M. Koch*
Environmental Quality Advisory Council

SUBJECT: Consideration of establishment of regulations for the protection and/or reforestation of stream buffers upstream of existing Resource Protection Areas

On November 26, 2007, the Board of Supervisors' Environmental Committee received a presentation from staff regarding options and considerations for the establishment of requirements for the protection and/or reforestation of riparian buffers upstream of existing Resource Protection Areas. At that meeting, staff was requested to return to a future committee meeting to continue this discussion.

EQAC commends the Board for consideration of establishment of protection/reforestation requirements along headwaters reaches of streams (intermittent and ephemeral streams) and notes that such an effort would complement a Policy Plan amendment addressing headwater stream and buffer area protection/restoration that is under consideration at this time. We look forward to working with the board and staff on this issue.

SMK:nhk

cc: Anthony H. Griffin, County Executive
Robert A. Stalzer, Deputy County Executive
Jimmie D. Jenkins, Director, Department of Public Works and Environmental Services
James P. Zook, Director, Department of Planning and Zoning
EQAC file, January 2008

Environmental Quality Advisory Council (EQAC)
c/o Department of Planning and Zoning
Planning Division
12055 Government Center Parkway, Suite 730
Fairfax, Virginia 22035-5509
Phone 703-324-1380
Fax 703-324-3056
www.fairfaxcounty.gov/eqac/

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution Concerning a Proposed Policy Plan Amendment Addressing Headwater Stream Protection/Restoration

January 9, 2008

Whereas, Fairfax County has a long history of stream valley and watershed protection; and

Whereas, in 1975 Fairfax County initiated an Environmental Quality Corridor (EQC) policy that would set aside stream valley buffers for protection; and

Whereas, in 1981 Fairfax County created detailed criteria and then revised such criteria in 1990 for the implementation of the EQC policy that have been operational since then; and

Whereas, the EQC Policy has resulted in thousands of acres of stream valley land protected and remaining in a natural vegetated buffer state; and

Whereas, in 1982, Fairfax County downzoned 64 square miles of the Occoquan watershed from one acre to five acre per lot zoning to protect drinking water supplies; and

Whereas, in 1993 Fairfax County adopted a Chesapeake Bay Preservation Ordinance in which lands adjacent to the perennial portion (as delineated by USGS maps) of streams were designated as Resource Protection Areas; and

Whereas, such RPA designation resulted in 520 linear miles of stream valley buffers being protected under this ordinance; and

Whereas, in 2003 the Chesapeake Bay Preservation Ordinance was amended and strengthened; and

Whereas, in 2002 and 2003 Fairfax County DPWES staff surveyed all Fairfax County streams to ascertain perenniality and created a map showing such perennial segments; and

Whereas, in 2004, the Fairfax County Board of Supervisors adopted this map as guidance for RPA delineation, which resulted in an additional 340 miles of perennial stream buffers being protected; and

Whereas, Fairfax County now has approximately 860 miles of perennial stream segments protected under the Chesapeake Bay Preservation Ordinance; and

Whereas, the upstream intermittent and ephemeral portions of Fairfax County streams, although ecologically very important, lack such protection; and

Whereas, in 2005 subsequent to the adoption of the new Chesapeake Bay Preservation Ordinance requirements and the perennial stream map, the Planning Commission Environment Committee, EQAC, and staff began discussions on how to further protect Fairfax County streams; and

Whereas, the Planning Commission Environment Committee has focused its discussion at this time on Comprehensive Plan Policy; and

Whereas, that discussion, subsequent analysis, and work have resulted in two specific options for changes to the Policy Plan for consideration in 2008 by the Planning Commission and the Board of Supervisors as follows:

Option 1 would provide general policy support for the protection and, where applicable, restoration of stream channels and associated vegetated riparian areas upstream of Resource Protection Areas and Environmental Quality Corridors. Under this option, there would be no changes to the Environmental Quality Corridor policy. There would be no minimum buffer widths established; rather, buffer width commitments would be negotiated during the zoning process.

Option 2 would expand the Environmental Quality Corridor policy such that it would explicitly encourage the inclusion of areas upstream of floodplains and Resource Protection Areas. Under this option, minimum buffer area widths would be determined through the application of the EQC delineation criteria; criteria relating to the inclusion of steeply sloping areas adjacent to streams (slopes of 15% or greater) and to the application of a minimum buffer width formula would largely determine the EQC boundaries. There is less flexibility in this option for negotiations during the zoning process.

Whereas, EQAC supports the general goals of BOTH Options but would prefer to offer a third option;

Therefore, be it resolved that EQAC thanks the staff and Planning Commission for their work on proposals to further protect Fairfax streams these last several years.

Be it further resolved that, with respect to the Policy Plan amendment, EQAC recommends:

- 1) The formation of a parallel intermittent and ephemeral stream protection strategy with the same philosophy as the EQC policy and with clear guidelines for buffer delineation in these areas.
- 2) This policy would additionally provide for flexibility in negotiating individual lot buffer protection and restoration commitments during the zoning process.



County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

Board of Supervisors
County of Fairfax
12000 Government Center Parkway
Fairfax, VA 22035

January 29, 2008

Chairman Connolly and Members of the Board:

On November 7, 2007, members of EQAC met with the Fairfax County Park Authority's Executive Committee to discuss issues of mutual interest and concern. Included was a discussion of Park Authority budget needs to support its Natural Resource Management Plan implementation activities. At EQAC's January 9, 2008 meeting, EQAC authorized me, by a unanimous vote of members present, to send this letter to you as a follow-up to that meeting.

EQAC wishes to stress its continued support for the resources necessary, including staff, to support implementation of the Park Authority's Natural Resource Management Plan. As noted in our *Annual Report on the Environment*, it is our view that some of these resource needs could possibly be met through internal resource allocations within the Park Authority; however, we also recommend that the Board of Supervisors provide additional funding and some staff positions for this effort.

I thank you for your consideration of the Park Authority's natural resource management needs and for your continued commitment and dedication to environmental protection and restoration efforts in Fairfax County.

Respectfully submitted,

Stella M. Koch, Chairman
Environmental Quality Advisory Council

cc: Fairfax County Park Authority Board
Timothy K. White, Acting Director, Fairfax County Park Authority
EQAC file: January 2008

Environmental Quality Advisory Council
c/o Department of Planning and Zoning
12055 Government Center Parkway, Suite 730
Fairfax, Virginia 22035-5509
Phone 703 324-1380
FAX 703 324-3056
www.fairfaxcounty.gov/eqac

POSITION STATEMENT FORM

GENERAL SUBJECT AREA -- TITLE OF PROPOSAL

ZONING- ADEQUATE PUBLIC FACILITIES ORDINANCE

PROPOSAL:

Support legislation to give localities authority to adopt an adequate public facilities ordinance. Legislation should permit localities to adopt provisions in their subdivision ordinances for deferring the approval of subdivision plats or site plans when they determine that existing schools, roads, public safety, sewer or water facilities are inadequate to support the proposed development. The legislation should also provide that an expressed purpose of zoning ordinances is to protect against an undue rate of development in relation to existing or available public facilities. Such legislation should not require the localities to construct the necessary infrastructure within a time frame established by the General Assembly.

SOURCE:

Environmental Quality Advisory Council, August 13, 2008

BACKGROUND:

In Virginia, local government lacks authority to manage the pace and timing of development that has been approved, even when there are inadequate public facilities to serve the new development. In recent legislative sessions, numerous attempts to authorize adequate public facilities ordinances have not been successful. See for example HB208 and HB 1297 in the 2008 Session. HB 1297 identifies this authority for localities such as Fairfax County that are subject to the provisions of the Chesapeake Bay Preservation Act.

The Board of Supervisors' Environmental Agenda commits to pursuing "state enabling legislation to ensure adequate infrastructure is in place for new developments".

RECOMMENDATION:

POSSIBLE SUPPORT OR OPPOSITION BY ORGANIZATIONS:

Members of the Virginia legislature who have sponsored or co-patroned adequate public facilities ordinance authorizing legislation include Delegates Cole and Frederick.

The Virginia Coalition of High Growth Communities (an organization comprised of at least 25 jurisdictions within Virginia, including Fairfax County) has in the past supported authorization for an adequate public facilities ordinance.

Numerous civic and environmental associations have in the past supported adequate public facilities legislation. Some of these organizations include the Virginia Conservation Network, The Virginia Chapter of the Sierra Club, the Virginia Municipal League, and the Virginia Association of Counties.

Opposition will probably come from certain segments of the business community, especially developers. The Fairfax Chamber of Commerce and the Northern Virginia Association of Realtors have opposed such types of legislation in the past.

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POSITION STATEMENT FORM

GENERAL SUBJECT AREA -- TITLE OF PROPOSAL

GREENHOUSE GAS EMISSIONS – MANDATORY REPORTING

PROPOSAL:

Support legislation that would require that the State Air Pollution Control Board adopt regulations requiring the reporting of greenhouse gas emissions from stationary sources. This would apply to those sources that emit greenhouse gases and that are already required to report emissions of other air pollutants. Legislation could also require those same parties to report greenhouse gas emissions from fleets of motor vehicles. Legislation should require the DOT to provide the DEQ with data necessary to maintain a greenhouse gas emissions inventory for individual road segments throughout the Commonwealth. The legislation should authorize the establishment of a voluntary program allowing persons to register voluntary reductions in direct or indirect emissions of greenhouse gases.

SOURCE:

Environmental Quality Advisory Council, August 13, 2008

BACKGROUND:

In Virginia, reporting of greenhouse gas emissions is not currently required. In the 2008 legislative session, attempts to authorize reporting requirements (HB1230 and SB234) were not successful. SB234 was approved in the Senate by a 25-15 vote but was left in the House of Delegates' Committee on Commerce and Labor (as was HB1230). EQAC's proposal is to support legislation that may be considered in the 2009 session similar to what had been proposed in 2008.

The Board of Supervisors supported SB 234 last year.

On July 16, 2007, Fairfax County, with other large counties from across the country, joined the Sierra Club in announcing the creation of the Cool Counties Climate Stabilization Declaration, a major new initiative to combat global warming. The counties — led by Fairfax County, King County, Wash., and Nassau County, N.Y. — pledge to reduce global warming emissions 80 percent by 2050, an achievable average annual reduction of 2 percent. The Cool Counties Climate Stabilization Declaration also urges the federal government to adopt legislation requiring an 80 percent emissions reduction by 2050 and calls for fuel economy standards to be raised to 35 miles per gallon within a decade.

On July 9, 2008, the Metropolitan Washington Council of Governments (COG) released a draft National Capital Region Climate Report that includes significant greenhouse gas reduction goals for the region as well as 78 recommendations to help area leaders and citizens meet the targets. Due to the region's strong employment and population growth, COG calculates that man-made greenhouse gas emissions, which cause climate change, will increase 33 percent by 2030 and 43 percent by 2050 under a business-as-usual approach. In order to have a meaningful impact in the fight against climate change, COG's Climate Change Steering Committee, which authored the report, recommends policies that will reduce regional greenhouse gas emissions. The report's main recommendations highlight energy use, transportation and land use.

RECOMMENDATION:

POSSIBLE SUPPORT OR OPPOSITION BY ORGANIZATIONS:

In the 2008 legislative session, SB234 was approved by a 25-15 Senate vote. The patron of the bill was Senator Whipple, and the bill was supported by many Senators from Northern Virginia. The chief patron of HB1230 was Delegate Vanderhye; eight other delegates were patrons of this bill.

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ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution Related to the Conservation of Trees During the Land Development Process

September 10, 2008

WHEREAS, the Commonwealth of Virginia has enacted legislation which allows for conservation of trees during the land development process in localities belonging to a non-attainment area for air quality standards; and,

WHEREAS, the Board of Supervisors has established a tree canopy goal of 45%, which requires that Fairfax County increase its canopy levels by a significant amount by the year 2037; and,

WHEREAS, without a local enabling ordinance the preservation of existing trees and their associated environmental benefits will continue to be overlooked in favor of planting new trees, which can take many decades to provide the same level of air and water quality benefits that are provided by existing trees; and,

WHEREAS, it is necessary to strengthen the capability of the County to carry out provisions of the Tree Action Plan in order to conserve and manage the urban forest resources of the County; and,

WHEREAS, the proposed amendments to “The Code of Fairfax County” and the proposed new chapter, Chapter 122, and the changes to the Public Facilities Manual appropriately address the issues of tree preservation during rezonings and during by-right development;

NOW THEREFORE BE IT RESOLVED, that the Environmental Quality Advisory Council recommends the approval by the Fairfax County Board of Supervisors of the proposed amendments to the Public Facilities Manual and The Code of The County of Fairfax, Virginia related to the Conservation of Trees During the Land Development Process.

On July 9, 2008, the Metropolitan Washington Council of Governments (COG) released a draft National Capital Region Climate Report that includes significant greenhouse gas reduction goals for the region as well as 78 recommendations to help area leaders and citizens meet the targets. Due to the region's strong employment and population growth, COG calculates that man-made greenhouse gas emissions, which cause climate change, will increase 33 percent by 2030 and 43 percent by 2050 under a business-as-usual approach. In order to have a meaningful impact in the fight against climate change, COG's Climate Change Steering Committee, which authored the report, recommends policies that will reduce regional greenhouse gas emissions. The report's main recommendations highlight energy use, transportation and land use.

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ENVIRONMENTAL QUALITY ADVISORY COUNCIL

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APPENDIX C

FAIRFAX COUNTY ENVIRONMENTAL EXCELLENCE AWARDS

The Fairfax County Environmental Excellence Awards have been established to recognize county residents, organizations, businesses and county employees who unselfishly dedicate time, energy and expertise for the betterment of the environment in support of countywide environmental goals and initiatives. Award recipients are selected by the Environmental Quality Advisory Council, and the awards are presented each fall during a meeting of the Fairfax County Board of Supervisors.

The recipients of the 2007 Environmental Excellence Awards were:

County Resident Awards:	Chet McLaren
Organization Award:	Katherine K. Hanley Family Shelter Project Management Team
Business Award:	“Jack-the-Ripper” Certified Arborists, Inc.

Chet McLaren has been EQAC’s Braddock District representative since 2002. He represents EQAC on the Fairfax County Tree Commission and has authored portions of the Land Use & Transportation and Ecological Resources chapters of this report. He has been recognized for the leadership roles he has taken on a wide range of civic and environmental organizations, including EQAC. He has served on the Fairfax County Park Authority Board, the Park Authority’s Advisory Board, the Wakefield Park Master Plan Committee, the Trails and Sidewalks Committee, the Upper Accotink Watershed Education Committee and the North Springfield Civic Association Board. As noted in his nomination, “Chet embodies everything the award strives to recognize. He has become [a] local source and advisor for emerging environmental concerns in the Braddock District as well [as] a friend of the many various environmental groups in the area. He is living proof that dedication, passion and a little elbow grease goes a long way in improving our local environment.”

As noted in the nomination materials for the Katherine K. Hanley Family Shelter Project Management Team, the shelter is the county’s newest homeless shelter and the first such shelter in the country to be recognized by the Green Building Initiative’s Green Globes environmental assessment and rating system for commercial buildings. The project was the first to be certified by the Green Building Initiative in the Commonwealth of Virginia. Environmental features that have been incorporated in the design of the facility include:

- Minimization of the facility’s footprint, thereby conserving natural features around the site.
- Use of energy efficient appliances and systems.

- Building materials chosen for minimal environmental impact, high recycled content and increased life cycle.
- Provision of a healthy interior environment through the use of finishes with low emissions of volatile organic compounds.
- Use of materials from nearby areas to reduce costs and environmental impacts of hauling.
- Use of natural landscaping to reduce irrigation needs.
- Use of several independent zones for the heating, ventilation and air conditioning system to save energy and costs.
- Use of low-emissivity windows, which lowers heat flow through the windows and saves energy.
- Provision of preferred parking for carpoolers.
- Provision of bicycle racks and an off-site trail.

The Project Management Team is comprised of the Fairfax County Department of Public Works and Environmental Services and Wisnewski Blair & Associates, Ltd.

The nomination for “Jack-the-Ripper, Inc.” Certified Arborists noted that this firm “has demonstrated a sustained and ongoing commitment to sound environmental business practices for twenty years.” The firm’s Web site highlights this commitment, noting that “When we see a scruffy looking public area, we clean it up. We especially enjoy saving road side trees that have been neglected.” The firm has incurred considerable expense for the upkeep and maintenance of beautification efforts at several sites in the Great Falls, McLean and Vienna areas. The firm has saved landmark trees including large oaks at the McLean Post Office and at Louse Archer Elementary School as well as a grove of trees at Flint Hill Elementary School. The firm was honored with a Fairfax County Friends of Trees Award at the 2008 Earth Day/Arbor Day ceremony in recognition of its efforts.

EQAC congratulates all award recipients.

In past years, Environmental Excellence Awards have been awarded to the following people and organizations:

2007

County Resident Awards:	Scott Birdwell Eleanor Quigley and Penelope Firth
Organization Awards:	Great Falls Citizens Association Invasive Management Area Volunteers
County Employee Award:	Judy Fincham

2006

County Resident Award:	Ken Andrews
Organization Award:	Northern Virginia Soil and Water Conservation District
Business Award:	Wetland Studies and Solutions, Inc.

2005

County Employee Award: Janet Rahman

2004

County Resident Award: Ned Foster
Organization Award: Reston Association

2003

County Resident Award: Joseph Chudzik
Organization Award: Students Against Global Abuse
County Employee Award: Noel Kaplan

2002

County Resident Award: Charlie Creighton
Organization Award: Hickory Farms Community Association

2001

County Resident Award: Chris Koerner
Organization Award: Bailey's Beautification Alliance

2000

County Resident Award: Norma Hoffman
Organization Award: Friends of Sugarland Run
County Government Employee Award: Gary Roisum

The nomination period for the Environmental Excellence Awards occurs during the spring of each year. EQAC encourages interested individuals, organizations, county employees and businesses to submit nominations.

APPENDIX D

ACRONYMS AND ABBREVIATIONS USED WITHIN THE 2008 ANNUAL REPORT

A&F	Agricultural and Forestal
ACM	Assessment of Corrective Measures
ANS	Audubon Naturalist Society
APHIS	Animal Plant Health Inspection Service (federal)
APC	Aviation Policy Committee (regional)
APR	Area Plans Review
BMP	Best Management Practice
BOS	Board of Supervisors (county)
CAAN	Citizens for the Abatement of Airport Noise
CADD	Computer-Aided Design and Drafting
CAIR	Clean Air Interstate Rule (federal)
CAP	Corrective Action Plan
CBOD₅	Chemical and Biological Oxygen Demand (5-day test)
CBPA	Chesapeake Bay Preservation Act (state)
CCTV	Closed circuit television
CDC	Centers for Disease Control and Prevention (federal)
CDF	Citizens Disposal Facility
CESQG	Conditionally Exempt Small Quantity Generator
CFI	Covanta Fairfax, Inc.
CFL	Compact fluorescent light
CFR	Code of Federal Regulations
cfu	Colony forming unit
CO₂	Carbon Dioxide
COG	Metropolitan Washington Council of Governments (regional-Also cited as MWCOG)
CSI	Clean Streets Initiative
CSXT	CSX Transportation
CTB	Commonwealth Transportation Board (state)
CTO	Certificate to Operate
CY	Calendar Year
dB	Decibel
dBA	Decibel (A-weighted level scale)
DCR	Department of Conservation and Recreation (state)

DDT	Dichloro-Diphenyl-Trichloroethane
DEET	N,N-diethyl-meta-toluamide
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality (state—also VDEQ and VA DEQ)
DNA	Deoxyribonucleic Acid
DNL	Day-Night Average Sound Level
DO	Dissolved Oxygen
DPWES	Department of Public Works and Environmental Services (county)
DPZ	Department of Planning and Zoning (county)
Dscm	Dry standard cubic meter
DU/AC	Dwelling Units per Acre
E&S	Erosion and Sediment
E/RRF	Energy/Resource Recovery Facility
ECC	Environmental Coordinating Committee (county)
EHD	Epizootic hemorrhagic disease
EIP	Environmental Improvement Program (county)
EPA	Environmental Protection Agency (federal—also USEPA)
EQAC	Environmental Quality Advisory Council (county)
EQC	Environmental Quality Corridor (county)
ERC	Employee Recycling Committee (county)
FAA	Federal Aviation Administration
FAR	Floor Area Ratio
FCB	Forest Conservation Branch (county)
FCDOT	Fairfax County Department of Transportation
FCPA	Fairfax County Park Authority
FCPD	Fairfax County Police Department
FCPS	Fairfax County Public Schools
FJLEPC	Fairfax Joint Local Emergency Planning Committee (regional)
FY	Fiscal Year
GIS	Geographic Information System
Hazmat/HazMat	Hazardous Materials
HB	House Bill (state)
HHW	Household Hazardous Waste
HID	High intensity discharge
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
IAQC	Interstate Air Quality Council (regional)
ICPRB	Interstate Commission on the Potomac River Basin (regional)
IESNA	Illuminating Engineering Society of North America
IHS	Insurance Institute for Highway Safety

IPLS	Integrated Parcel Lifecycle System
IT	Information Technology
kBTU/SF	Thousands of British Thermal Units per square foot
kWh	Kilowatt hours
LDS	Land Development Services function of the Department of Public Works and Environmental Services (county)
LED	Light-emitting diode
LEED®	Leadership in Energy and Environmental Design
LEPC	Local Emergency Planning Committee
LFG	Landfill gas
LFGTE	Landfill gas to energy
LID	Low Impact Development
LIS	Legislative Information System (state)
LOS	Level of Service
MCL	Maximum Contaminant Level
mgd	Million gallons per day
mg/l	Milligrams per liter
MLC	McLean Land Conservancy
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Storm Sewer System
MSW	Municipal Solid Waste
MW	Megawatts
MWAA	Metropolitan Washington Airports Authority (regional)
MWAQC	Metropolitan Washington Air Quality Committee (regional)
MWCOG	Metropolitan Washington Council of Governments (regional – also cited as COG)
NAAQS	National Ambient Air Quality Standards
NEST	Neighborhood Ecological Stewardship Training (county)
NiCad	Nickel-Cadmium
NMPCPCP	Noman M. Cole, Jr. Pollution Control Plant (county)
NOx	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRMP	Natural Resource Management Plan
NTU	Nephelometric Turbidity Unit
NVCT	Northern Virginia Conservation Trust
NVCWP	Northern Virginia Clean Water Partners (regional)
NVRC	Northern Virginia Regional Commission (regional)
NVRPA	Northern Virginia Regional Park Authority
NVSWCD	Northern Virginia Soil and Water Conservation District

NVUFR	Northern Virginia Urban Forestry Roundtable
NWR	National Wildlife Refuge
OWML	Occoquan Watershed Monitoring Laboratory
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PFM	Public Facilities Manual (county)
PM 2.5	Particulate Matter less than 2.5 microns in diameter
PLUS	Planning Land Use System (county)
ppm	Parts per million
PRM	Principal Recyclable Material
QA/QC	Quality Assurance/Quality Control
RBRC	Rechargeable Battery Recycling Corporation
RIF	Reduction in force
RDOC	Recycling Drop Off Center
RPA	Resource Protection Area
SARA	Superfund Amendments and Reauthorization Act of 1986 (federal)
SB	Senate Bill (state)
SCRAP	Schools/County Recycling Action Partnership
SDWA	Safe Drinking Water Act (federal)
SIP	State Implementation Plan
SO₂	Sulfur Dioxide
SOCs	Synthetic Organic Compounds
SWANA	Solid Waste Association of North America
SWM	Stormwater Management
SWMP	Solid Waste Management Plan (county)
TCC	Transportation Coordinating Council (regional)
TDM	Transportation Demand Management
TMDL	Total Daily Maximum Load
TOD	Transit Oriented Development
TPB	Transportation Planning Board (regional)
TTHM	Total Trihalomethanes
UDIS	Urban Development Information System
UFMD	Urban Forest Management Division (county)
UOSA	Upper Occoquan Sewage Authority
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency (also EPA)
USGS	United States Geological Survey
V/C	Volume to Capacity Ratio
VA DEQ	Virginia Department of Environmental Quality (also DEQ and VDEQ)
VDACS	Virginia Department of Agriculture and Consumer Services

VDEQ	Virginia Department of Environmental Quality (also VA DEQ and DEQ)
VDGIF	Virginia Department of Game and Inland Fisheries
VDOF	Virginia Department of Forestry
VDOT	Virginia Department of Transportation
VIMS	Virginia Institute of Marine Science
VOC	Volatile Organic Compound
VOF	Virginia Outdoors Foundation
WMATA	Washington Metropolitan Area Transit Authority
VPDES	Virginia Pollutant Discharge Elimination System
VRE	Virginia Railway Express
VSMP	Virginia Stormwater Management Program
VTRC	Virginia Transportation Research Council
WID	Watershed Improvement District
WTP	Water treatment plant
ZOAWP	Zoning Ordinance Amendment Work Program (county)