Annual Report
on the
ENVIRONMENT
2006

Fairfax County, Virginia
Environmental Quality Advisory Council

December 2006

The cover photo shows a stream in the Kingstowne area of Fairfax County that has been restored. The project is described on page 82 of this report.
The photo has been provided by the
Northern Virginia Soil and Water Conservation District

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on the
ENVIRONMENT

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Fairfax County, Virginia

Environmental Quality Advisory Council

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Printed on recycled paper

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INTRODUCTION

This year's Annual Report on the Environment has been prepared by the Environmental Quality Advisory Council (EQAC). 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 contains chapters on major environmental topics including: land use and transportation; air quality; water resources; solid waste; hazardous materials; ecological resources; wildlife management; and noise, light, and visual pollution. Within each chapter are: a discussion of environmental issues; a summary of relevant data; and a discussion of applicable government programs. Where relevant, discussions of legislative issues are provided. Most of the chapters conclude with recommendations that identify additional actions that EQAC feels are necessary to address environmental issues. In this 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."

This report covers activities affecting the environment in 2005; however, in some cases, key activities from 2006 are also included.

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

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 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 Conservancy
Metropolitan Washington Airports Authority (MWAA)
Metropolitan Washington Council of Governments (COG)
Northern Virginia Conservation Trust
Northern Virginia Regional Commission
Northern Virginia Regional Park Authority
Northern Virginia Soil and Water Conservation District
Reston Association
United States Fish and Wildlife Service
United States Geological Survey
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

In addition, 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 2005 *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

December 4, 2006

Chairman Connolly and Members of the Board:

The Environmental Quality Advisory Council (EQAC) is pleased to present the 2006 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 eight chapters – each chapter addressing a different aspect of the environment. Again this year the chapters are arranged to reflect the order of topics listed in the board of supervisors' Environmental Agenda.

EQAC thanks the board for its continued strong support of environmental programs. We find that every year, Fairfax County's programs continue to improve and advance in their efforts at environmental stewardship. We specifically thank the board for the strong improvements in watershed and stream stewardship reflected by substantial increases for stormwater funding and the commitment to having watershed planning completed and implementation projects begun for all 30 Fairfax County watersheds. In addition we acknowledge the significant improvements to the air quality program. We again thank you for the addition of an Air Quality Program Manager, for leading the region in air quality programs by purchasing wind energy, doing diesel retrofits for county Connector and school buses, for the purchase of hybrid automobiles for county fleets and for actively promoting the county's telework program.

As real estate tax revenues flatten in response to a slowing in the real estate boom of the past few years we would first and foremost ask that you continue to support the depth of environmental programs that have been developed over the last decade. 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. This includes funding of all requests for the Environmental Improvement Program for the upcoming fiscal year. The EIP is a reflection of those non-stormwater programs necessary to implement the Environmental Agenda adopted by the board for this county.

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As was stated last year, all of the above mentioned efforts are important pieces of managing a very large and challenging whole, Fairfax County's environmental legacy. In the light of the Environmental Agenda document and subsequent Environmental Improvement Program we ask that the board also change focus from the discrete programs to the overall picture of the county's environmental management. We think this may be the most significant challenge facing Fairfax County, the integration of these programs in a synergistic fashion. In light of the county's approaching build-out, we ask that you look at this integration of various programs and potential for maximizing efforts. We do not have an adequate green infrastructure plan that looks at connecting the thin green lines, the parks and Environmental Quality Corridors in a way that maximizes our efforts at protection. With the exception of the Tysons Corner and perhaps Merrifield efforts, we have not initiated a hard look at the gray infrastructure (parking lots and other paved impervious surface) throughout the county in terms of re-use, reducing auto reliance and sharing parking. We have just begun the process of creating integrated plans for some segments of the county in terms of building and transportation that focuses on transit and on increasing pedestrian friendly environments. EQAC thanks the board for recent county-led efforts to define transit-oriented development for the Policy Plan and for hiring PBPlacemaking to aid the Tysons Land Use Task Force in creating a publicly acceptable redesign of a true TOD, pedestrian friendly Tysons Corner. We also thank the board for the very necessary Traffic Demand Management RFP, which will include changes in parking requirements for TOD areas. One of the challenges for this county as it diversifies its types of development will be to create regulations that are not countywide but specific for those kinds of development.

To accomplish the above requires the replacement of the county's rather old information system UDIS. We therefore, thank the board for funding the efforts underway to update and replace that system for the county with a highly flexible database that will allow the county to do innovative design and management for all the county's resources. We also thank the county staff for implementing the Integrated Parcel Lifestyle System which will go long way towards understanding how land in the county is being used and how it changes over time. Additionally, we urge that the county integrate the use of 1) planimetric data, which portrays features you can see such as buildings, driveways pools etc., 2) oblique data, which allows the creation of three dimensional images for use in the planning process and 3) models, which, although they are expensive, can analyze the data and create reports and projections. A good and flexible land use planning and data management system would go a long way towards helping the county integrate environmental management with land use and transportation planning in a meaningful way.

In addition, we have three more specific requests.

The county has passed an outstanding lighting ordinance in recent years that protects the night sky and neighborhoods. We feel, however, that this ordinance does not adequately address the issue of glare. We urge the board to request that county staff readdress this issue. It is glare that often pits neighborhoods against lighted

recreational fields and we believe that solutions are available if the county will consider them.

We also recommend the hiring of a soil scientist. The county has a diversity of soil types, some problematic for buildings and infrastructure. The presence of staff with understanding of these issues would be a welcome addition to our resources.

We also wish to raise a concern about resources dedicated to deer management and other wildlife management issues. With needs for increasing wildlife management efforts, we are concerned that simply maintaining the existing level of staff support for these efforts may result in a dilution of these efforts and a reversal of the gains that have been made in deer management. Additional staffing in the county's wildlife management program is needed.

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 2005, but also includes significant actions from 2006 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.

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 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.

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 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.

EQAC would also like 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, 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 fully 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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Progress Report on 2005 Recommendations

I. 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."	Staff anticipates that an analysis of Comprehensive Plan changes will be complete in early 2007. However, the document will lack an evaluation of the interrelationships among the Plan's underlying principles (as recommended by EQAC). Staff believes that this latter point is addressed in Staff's response to Recommendation #1b.	1a & 1b: EQAC encourages staff to proceed on these two recommendations and reiterates its recommendation.	In process.
1b. EQAC recommends that the county assess the state of the county with respect to the PLUS principles set forth in 1975.	Staff supports EQAC's recommendation and plans to bring this recommendation to the attention of the Planning Commission for its consideration. Staff feels that this recommendation presents a possible framework for evaluation of change in the county and addresses that portion of Recommendation #1a dealing with interrelationships among the Plan's underlying principles.		Not yet.
2. EQAC recommends that the county continue to pursue replacing or upgrading the UDIS System, to include the capability of tracking the full lifecycle of each land parcel in the county.	Fairfax County has begun developing an integrated parcel lifecycle system that will allow parcel level data to be captured in a GIS based data warehouse. Work began in 2006 and will continue into calendar year 2007.	EQAC encourages staff to continue with the development of this UDIS replacement and to include the additional capability of tracking each land parcel.	In process.

Land Use & Transportation Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3a. EQAC recommends that the BOS and DPZ continue to consider land use and transportation together when revising the Comprehensive Plan.	This recommendation is being addressed and staff concurs with the need to evaluate the implications of proposed land use changes on transportation facilities during the review of proposed Plan amendments.	The UDIS replacement will improve the county's ability to understand the macro effects of the changes caused by Plan amendments.	In process.
3b. EQAC recommends that the county identify and collect data on a parcel level that allows analysis of the parcel effect on environmental quality.	This recommendation is partially being addressed. However, funding is not currently available to support a comprehensive update of all county planimetric data. Staff recognizes that updating all planimetric data has benefits beyond determining environment impacts. The cost would be an annual average of $404,000 if updated on a four-year cycle.	EQAC believes that the benefits associated with updating the county planimetric data are justified and continues to support this recommendation.	Only partially.
3c. EQAC recommends that the county develop models that allow analysis of the macro effects of land use and transportation decisions.	Staff is working toward evaluating and updating the county's Transportation Plan, working with COG on addressing air quality issues, and continuing to improve the use of TDMs. However, to obtain full benefits from the transportation model for analyses and conducting subarea studies, additional resources of funding and staff are needed.	EQAC reiterates this recommendation.	No.
3d. EQAC recommends that the county adopt new standards to support Low Impact Development as part of the Public Facilities Manual. The county should also encourage Green Building.	This recommendation is in the process of being addresses. Some LID practices are being proposed for the PFM. Staff plans to propose Comprehensive Plan text to the Planning Commission and Board of Supervisors to support green building practices.	The process is underway toward addressing this recommendation, but more needs to be done. EQAC reiterates this recommendation.	Partially in process.

Land Use & Transportation Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
4a. EQAC urges the BOS to continue to aggressively support telecommuting among county staff.	The BOS endorsed the COG goal of 20% of the area's eligible workforce telecommuting by 2005. This goal was met. During 2006, the county will continue to increase the number of teleworkers throughout the county organization.	EQAC commends the BOS and the county staff in achieving its goal of 20% telecommuting by county staff.	Yes.
4b. EQAC commends the BOS for maintaining its leadership role in improving the environment through greater use of teleworking by establishing a program directed at encouraging employers in the county to adopt or expand telework opportunities.	The Fairfax County Employer Services Program, sponsored by the Department of Transportation, assists public and private sector businesses and employees in finding transportation solutions, including telework. In 2005, they made 75 site visits, held 15 Transportation Fairs for county employees, and worked with 16 businesses to develop Transportation Demand Management Programs.	Fairfax County has established a leadership role in teleworking and should continue this role through an aggressive campaign to encourage greater use of teleworking as a transportation solution.	In process.
4c. EQAC recommends that the BOS work with the federal government to encourage an increase in teleworking. EQAC also recommends that the county work with the Virginia congressional delegation to secure resources to establish teleworking sites within the county.	The Fairfax County Board of Supervisors and staff regularly review and comment during funding proposals and legislative initiatives that advance teleworking in the region.	EQAC encourages the continuation of seeking increased funding and support for teleworking.	In process.

Land Use & Transportation Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
5a. EQAC commends the board of supervisors for funding the Non-Motorized Transportation (Trails) Committee [now the Trails and Sidewalks Committee] in FY 2005 and recommends that the BOS continue to provide regular funding to this committee.	In November of 2004, county voters approved a $165 million general obligation bond referendum as part of the board's four-year Transportation Plan. Of the $165 million, $10.8 million was designated to fund pedestrian improvements such as sidewalks and trails. Additionally, $2.0 million was appropriated as part of the FY 2005 budget for streetlight, drainage, sidewalk, trail and walkway projects, $990,000 of which was earmarked for sidewalk and trail construction. Currently, both the Non-Motorized Transportation Committee [Trails and Sidewalks Committee] and the Pedestrian Task Force are developing lists of priority projects.	EQAC recommends that trail projects continue to be funded.	In process.
5b. EQAC recommends that the county focus on improving transit utilization through a systematic plan that focuses on multiple transit options within a community.	This recommendation is being addressed on an ongoing basis. The BOS has directed the Department of Transportation to initiate a number of projects that are relevant to this recommendation.	EQAC recommends that these efforts be continued and reiterates its recommendation.	In process.

II. AIR QUALITY

Air Quality Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. County staff should continue to participate in the regional planning efforts through the Metropolitan Washington Council of Governments in identifying both quantifiable and qualifiable emission reduction measures and strategies to reduce air pollutants so that the Clean Air standards can be attained.	Staff agrees with this recommendation and supports it by participating in regional air quality planning efforts. This recommendation is therefore addressed.	EQAC is pleased that our recommendation has been acted upon in this vital area of air quality.	Yes, and these activities should continue.
2. EQAC is pleased with the work of the county's Air Quality Subcommittee that included a variety of air quality management strategies as shown in the interim report and Clean Air Café menu that was presented to the board's Environmental Committee. EQAC recommends that the board adopt and implement all the recommendations shown in the menu and report.	This recommendation is in the processed of being addressed. Staff agrees with and fully supports EQAC's recommendation to implement the recommendations shown in the interim report and Clean Air Café menu. Staff is continuing the process of implementing more recommendations as funding becomes available.	EQAC is pleased with progress to date. EQAC commends the board and its strong support for air quality and recommends that the board continue to fund air quality projects and initiatives shown in the county's Environmental Improvement Program.	Solid progress – needs to continue.
3. EQAC is pleased to see the air quality outreach effort that the county has started. EQAC recommends that the board continue to fund the air quality outreach program.	Staff will continue the work on this. In 2005, the county became a media sponsor with Clean Air Partners. This is a public-private partnership to build and broaden awareness of how individuals contribute to air pollution and to promote easy and effective voluntary actions to reduce the production of air pollution.	Good progress. EQAC comments the board for this effort.	Significant progress – needs to continue.

III. WATER RESOURCES

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC commends the board for its actions in spring 2005 authorizing one penny of the real estate tax to be dedicated to the stormwater management program. However, since this commitment will require reauthorization every year, EQAC continues to encourage the creation of a more stable funding source for watershed improvement.	This recommendation is being addressed via the annual budget process. There was one cent of the real estate tax in the budget for FY 2007.	EQAC is pleased that the board of supervisors approved the one penny of the real estate tax to be dedicated to the stormwater management program for FY 2007. EQAC continues to encourage the creation of a sustainable and stable funding source for watershed improvement initiatives.	In process via the budget process, but not the stable source EQAC suggests.
2. EQAC is pleased that Fairfax County is investigating and reexamining the current definitions and requirements pertaining to adequate outfall. However, EQAC cannot over emphasize the importance and need for increased monitoring of predevelopment stormwater management controls and taking enforcement action to ensure inadequate controls are corrected prior to construction and if necessary during construction.	The recommendation is being addressed. In a Letter to Industry, dated October 3, 2005, professionals who prepare plans for review and approval were notified of a new requirement to analyze and address adequacy of outfalls during the construction phase. A committee of professionals from the public and private sector developed recommendations for amendments to the Public Facility Manual's provisions for adequate drainage. The board of supervisors adopted the amendments on February 6, 2006. The board approved additional site review and inspection positions for Land Development Services in the FY 2006 budget. These additional positions will assist in identifying issues early in the plan review and inspection phase of construction.	EQAC commends the board of supervisors for adopting amendments to the PFM's provision for adequate drainage. EQAC notes the need for increased monitoring and enforcement to ensure inadequate controls are corrected prior to construction. It is important that the county hire the appropriate number of staff to handle the estimated inspection workload. Hopefully, the increased staff positions will be sufficient. If not, more should be added.	Yes.

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC strongly recommends that Fairfax County continue 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.	Staff notes that effort enumerated in the staff response to a similar recommendation from EQAC in its 2004 Annual Report continue. The additional stormwater management information that is now provided during the zoning process enhances the county's ability to evaluate stormwater management needs and implications during this process. The county continues its multi-year effort to develop watershed management plans for all thirty of the county's watersheds. By the end of 2005, about 60 percent of the county had watershed management plans completed or in development.	EQAC is pleased that the recommendation continues to be addressed and worked on. EQAC notes that land use planning is the single most effective tool for the protection of water resources.	In progress.
4. EQAC commends county staff for investigating and evaluating LID and innovative BMP techniques for inclusion in the PFM. EQAC recommends that the county continue to encourage such innovative measures, that the appropriate staff members are educated on reviewing designs and inspecting projects that incorporate these new techniques and that staff coordinate efforts on developing a process through which these plans are addressed in a timely matter.	Staff agrees with this recommendation and it is in the process of being addressed. In 2005, six LID practices were identified by DPWES for inclusion in the Public Facilities Manual. DPWES will provide appropriate training for review and inspection staff as part of the implementation of the PFM amendments after adoption. DPWES is also working with the Northern Virginia Regional Commission and the Engineers and Surveyors Institute on preparation of a regional manual for LID techniques and practices.	EQAC continues to commend county staff for its work in incorporating LID practices into the PFM and encourages the continuation of this process.	In progress.

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
5. EQAC continues to support the full funding and implementation of the comprehensive countywide watershed management program.	Many efforts in support of EQAC's recommendation are underway in the county, funded by the dedicated penny on the real estate tax. The watershed planning effort will continue. Six LIDs are in the process of being added to the Public Facilities Manual and others will be investigated.	EQAC's recommendation is on the way to being satisfied – if the county continues with its current activities.	In progress, with more to be done.
6. EQAC continues to recommend posting of health warnings for county streams with high fecal coliform and E. coli bacteria levels until an investigation is conducted and the source of the contamination is identified and remediated. EQAC recommends that these investigations be carried out and remediation plans be implemented whenever there are actual threats to public health.	As recommended by EPA, Fairfax County completed its transition in 2005 to using E. coli as our indicator of possible fecal contamination versus using fecal coliform bacteria. Staff does not support the proposal for a sign campaign. One reason is that a stream could be above the DEQ maximum allowance during one sampling period and below it the next time. This would require staff to constantly put up and take down signs. Staff concurs with a public information campaign.	EQAC continues to recommend either posting health warnings at county streams with high bacterial levels OR the creation of an improved public outreach information that is effective in reaching more residents.	No.
7. EQAC notes the MS4 requirement to develop a long-tem watershed monitoring program to verify the effectiveness and adequacy of stormwater management goals and identify areas of water quality improvement or degradations. EQAC recommends a monitoring program to evaluate the effectiveness of stormwater detention facilities.	In calendar year 2006, as part of the MS4 permit requirements, a pilot study will be conducted to determine the effectiveness of various BMP control types. Efforts are ongoing to determine the phosphorous, nitrogen and total suspended solids removal efficiencies of site-specific stormwater Best Management Practices. The results of expanded monitoring of the Kingstowne development on Dogue Creek revealed that the performances of existing BMPs are not meeting expected levels and that further analysis is needed to determine the cause. In 2005, several innovative BMPs were constructed at the Providence District Government Center and Merrifield Fire and Rescue – Station 30. Data were collected on stormwater runoff prior to this construction and will be collected post construction.	The steps taken in 2005 and 2006 partially address EQAC's recommendation. Once analyses are complete of the programs mentioned by staff, EQAC suggests that an improved monitoring program be devised.	Not yet, but progress is being made.

Water Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
8. Dredging of stormwater management ponds creates the need for adequate disposal areas. Homeowners' associations and private pond owners need assistance in the disposal of the materials removed from ponds. Creating spoil disposal/recycling areas in the county should be considered.	Staff concurs that this is an emerging issue that will require considerable evaluation. There are wide-ranging implications and the potential for considerable costs and liability for the county. Criteria need to be developed to justify the use of county funds. More analysis and study needs to be done.	EQAC continues to believe that this issue needs to be addressed and recommends that the county conduct a study to analyze and explore options.	No.
9. EQAC commends the county for its existing stream protection requirements for perennial streams. EQAC encourages the Board of Supervisors to support future protective measures for intermittent and headwater streams such as the establishment of protective buffers on either side of a stream.	Two joint meetings of the Planning Commission's Environment Committee and EQAC were held to discuss options for stream protection prepared by staff. Staff is doing a representative analysis across the county to determine the impacts of applying a 50- or 100-foot buffer around non-perennial streams (with the exclusion of roadside ditches). Staff supports the continuation of these discussions. Staff also notes that establishing and restoring deficient streamside buffers along perennial streams within existing Resource Protection Areas also warrant attention.	EQAC continues to support future protective measures for intermittent and headwater streams. EQAC has been involved in discussions of this with staff and the Planning Commission's Environment Committee and will continue as needed.	No.

IV. SOLID WASTE

There were no Solid Waste recommendations in the 2005 Annual Report

V. HAZARDOUS MATERIALS

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC continues to recommend an aggressive public education campaign on how to properly dispose of household/residential, commercial and industrial hazardous waste. Continuous partnering with the Northern Virginia Board of Realtors and solid waste haulers to distribute information to all new residents in the county is suggested. New residents would be anybody buying or renting a house, townhouse, or condominium. Creative use of other organizations is also encouraged.	This recommendation involves two separate and distinct waste streams (and regulations) that involve hazardous wastes generated by residents and hazardous wastes generated by commercial and industrial establishments. Whenever appropriate, news releases are prepared for every hazardous materials reduction or collection event. In addition to distribution to the media, information is included in "Newslink" and daily E-mail newsletter to county employees. Events include: expanded/mobile household hazardous waste recovery, partnering with Northern Virginia Board of Realtors, partnering with Fairfax Chamber of Commerce, partnering with targeted retail/wholesale/supply outlets, creative use of other organizations and other special events. While most of this recommendation is being implemented, it is difficult to implement asking waste removal companies to include outreach materials in their mailings to their customers.	EQAC continues to recognize outreach and educational efforts made by staff for hazardous materials disposal. These efforts have reached many people and businesses. Staff has worked with creative partnering to assist with this effort. All of the effort could be evaluated as accomplishing the recommendation. EQAC recognizes this fact, but continues to strongly believe, with the growth in Fairfax County, that there are many more residents and businesses to reach, as well as the need to continuously remind those residents and businesses currently complying. These efforts, as well as new ideas, by the staff should be continuous each year.	Yes, efforts have been, and are continuing. EQAC believes these efforts need to be consistent and ongoing.

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
2. EQAC recognizes the county's ability to collect rechargeable batteries at the I-66 transfer station, the I-95 SW 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.	Fairfax County is in the process of implementing a comprehensive rechargeable battery program for county residents and businesses. This plan includes: partnering with the Rechargeable Battery Recycling Corporation to recycle rechargeable batteries, updating the county Web site to add an entire page devoted to proper management of all batteries, a new educational campaign about recycling rechargeable batteries to county residents, initiating discussions within NVRC about developing a regional approach to providing information about recycling electronics and other items that contain toxic components and including battery recycling in all recycling events conducted by the county.	EQAC appreciates staff embracing and implementing this recommendation on recycling rechargeable batteries. We hope this will continue to be implemented. The key to the success of this recommendation will be in the continued implementation at this same or increased level.	Yes.

Hazardous Materials Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC recommends continuing to advertise and educate the public regarding the types of hazardous materials and other environmental situations citizens 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.	The Fire & Rescue Department works through its Public Information Officer, the Office of Public Affairs and the Fairfax Joint Local Emergency Planning Committee to advertise and educate the public in this area. The FRD, OPA and FJLEPC will continue to work together to develop avenues for disseminating educational materials regarding the release of hazardous materials, proper disposal of household hazardous waste and chemical emergency planning. However, resources are very limited and most of the costs have been solely borne by FRD in developing and distributing these materials. Recent budget cuts have resulted in greatly curtailing the efforts to develop additional programs and have caused efforts to focus on maintaining what is currently in place. There is limited funding supporting the efforts of FJLEPC in developing and maintaining its Web site. FRD does not have staffing or resources to be able to support the FJLEPC in this endeavor outside developing Web content. An additional hindrance to fully developing educational programs of this type is that the FRD staff position currently assigned as liaison to the FJLEPC and developing educational outreach programs from hazardous materials is an exempt limited term position. Neither FRD nor the FJLEPC have the budgetary resources to develop, print and market the needed programs/educational materials. The FJLEPC relies on donations to print its brochures regarding proper notification procedures for hazardous materials releases.	EQAC has a member serving on the FJLEPC and is aware of the struggle for funding by the multi-jurisdictional, federally mandated organization. If a chemical release (accidental or intentional) occurs, it is FRD that will be the primary agency involved and will incur costs related to handling the incident. Education to reduce the risks of releases should be recognized as a necessity in the county's budget. It should not only be recognized as a potential cost savings for the FRD, but a pro-environment investment. EQAC strongly recommends the county address this need in the next budget.	Yes, as far as is possible without funding support.

VI. ECOLOGICAL RESOURCES

Ecological Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the county BOS develop and implement a countywide natural resource management plan. Two tasks should be done first: complete a countywide baseline natural resource inventory and adopt a unified natural resource conservation policy.	Staff concurs with EQAC's recommendation. A comprehensive survey and mapping of vegetation ecosystems that occur in Fairfax County is needed. Satellite imagery (2002/2003) will be used to map the county based on the National Vegetation Classification System. This effort is expected to be complete in 2007. The Fairfax County Park Authority adopted a Natural Resource Management Plan for Park Authority lands in 2004; however, insufficient funding exists to implement this plan. Another effort relating to natural resource management is the development of watershed management plans.	This is a long-standing EQAC recommendation. EQAC notes that efforts are underway that support EQAC's recommendation. However, inadequate funding exists to implement the Natural Resource Management Plan. EQAC supports these efforts and reiterates its recommendation.	Improved progress, but more needs to be done.
2. EQAC recommends continued support for the public-private partnership with the Northern Virginia Conservation Trust and further recommends the existing three-year agreement be extended.	Staff agrees with EQAC that NVCT has proven its value to the county. Funding was appropriated to the NVCT for FY 2006 for $258,120. Staff supports contributory agency status for NVCT. No further action is required. The Board of Supervisors will determine on a year-to-year basis the funding that can be allocated to NVCT.	EQAC commends the BOS for creating the original public-private partnership with NVCT. The BOS is funding NVCT past the term of the original three-year MOU. However, a new MOU was not put into place. EQAC supports a continuing partnership with NVCT, and believes that a multi-year MOU is the best avenue to accomplish this.	Program funded, but no MOU.

Ecological Resources Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC recommends that the BOS continue to support proposals to amend Virginia State Code §15.2-96 1, allowing the county to enact tree preservation ordinances.	Staff concurs that the county should continue to pursue new tree preservation legislation or amendments to existing Virginia State Code § 15.2-961 at the Virginia General Assembly. Efforts to place a strong emphasis on tree preservation have failed to date.	EQAC is extremely disappointed that the efforts to enact tree preservation ordinances have failed. EQAC continues to recommend that the BOS continue to pursue legislation that would allow a tree preservation ordinance.	No.
4. Fairfax County no longer has soil science expertise on the county staff. However, the BOS did provide funding to the Northern Virginia Soil and Water Conservation District for mapping of the county's soils. EQAC recommends that the board of supervisors continue the agreement with NVSWD to provide soil scientist expertise	Staff concurs that the expertise of the soil scientist is needed in the county beyond the completion of the soil survey update. Funding the current soil scientist position within NVSWCD is cost-efficient for the county. If the expertise of a soil scientist were to be continued, a funding allocation would be needed in the FY 2008 budget.	EQAC reiterates its recommendation and supports funding for the soil scientist position in NVSWCD.	No.

VII-1. IMPACTS OF DEER IN FAIRFAX COUNTY

Deer Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the board of supervisors continue to implement and monitor the comprehensive deer management program as set forth in the November 1998 Integrated Deer Management Plan and refined by the Deer Management Committee in the summer of 1999 and in subsequent meetings.	The list of parks selected in the summer of 2005 as potential sites for deer reduction totaled 25. While this list has grown annually, the staffing and budget have both decreased. As a result, past gains have been lost in some locations. Based on the number of dead deer picked up by the Virginia Department of Transportation, the county's deer population is approaching a record high, which may exceed the 1966 level. A marked improvement is observed in the understory in parks where deer populations have been reduced to desired density levels. While it will take years for the habitat to rebound, these early precursors are encouraging.	EQAC notes with concern the lost of gains in the deer management program. This loss is due to inadequate staffing and budget. Where gains have been maintained, the parks show evidence of habitat rebound.	In process, but needs increased staffing and budget.
2. EQAC strongly commends active participation of the Fairfax County Park Authority in the deer management program.	This recommendation continues to be addressed. The Park Authority continues to work within the guidelines of its Wildlife Conflict Resolution Policy to reduce and mitigate the impact of an overabundant deer population. The effect of increasing demands using limited resources appears to have diluted the overall effort and gains made have been lost in some locations.	EQAC notes with concern the lost of gains in the deer management program. This loss is due to inadequate staffing and budget. Where gains have been maintained, the parks show evidence of habitat rebound.	In process, but needs increased staffing and budget.
3. EQAC believes the deer management program must address increased attention to the problems associated with owners of small private properties who are suffering serious impacts from deer.	The Virginia Department of Game & Inland Fisheries will issue permits to property owners experiencing damage from any wildlife, but many residents are not aware of this program. Starting in the fall of 2005, DGIF adopted a regulation allowing crossbows to be used during legal hunting seasons. Public education efforts will be expanded to include information on these changes. Efforts to adapt regulations and state code sections to further address problems by these landowners are ongoing.	County staff should be prepared to update residents who contact the county with regard to deer problems and any new rules should be made available on the relevant section of the county's Web site.	In process.

Deer Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
4. EQAC believes the management program must accomplish: (1) Immediate, sustained reduction of deer population. (2) Ongoing monitoring of availability of methods for maintaining population limits. (3) Consideration of development and its effects on ecosystem health and biodiversity.	The deer management program continues to reduce local herds to levels consistent with long-term carrying capacity of remaining habitats. Managed hunts, sharpshooting, and private/public partnerships are combined to apply the necessary control pressure to first stabilize and then reduce deer herds. Fairfax County continues to monitor developments and progress of non-lethal methods of deer herd control. Funding for this program competes with other police priorities, thus making progress challenging.	This recommendation continues to be addressed, but additional resources are needed.	In process, but additional resources are needed.
5. EQAC strongly recommends that the board of supervisors continue to provide for a vigorous and enhanced program of public education as is now being done by the Division of Animal Services and on the county's Web site.	Educational efforts have been underway since the start of the Deer Management Program. Efforts include programs on Channel 16, publications available in the Fairfax County library system, interactive displays at Celebrate Fairfax, and programs by the Fairfax County Wildlife Biologist.	This recommendation continues to be addressed.	Yes.
6. EQAC endorses ongoing public input into the Deer Management Plan.	The county's Web page devoted to deer management issues continues to be updated and expanded. This site provides a wealth of information to residents about the issue and the efforts being undertaken to deal with the associated problems. Residents are able to send e-mail through this site to voice their opinions or to ask questions. Input is also received from residents via telephone, e-mail or conversations at meetings of special interest groups, civic associations, professional conferences, garden clubs or other public gatherings.	This recommendation continues to be addressed.	Yes.

VII-2. IMPACTS OF GEESE IN FAIRFAX COUNTY

Geese Management Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC finds the current programs are effective and should be continued.	The Animal Services Division concurs with EQAC's recommendation and intends to continue and expand the current programs. However, GeesePeace personnel notified the Animal Services Division that they would be unable to continue the program partnership with Fairfax County. While the Animal Services Division desires to continue a goose management program, it is unclear what the new program will encompass.	EQAC continues to support continuation and expansion of current efforts. Since termination of the partnership with GeesePeace, the BOS should ensure that adequate county funding is provided.	Yes, but additional resources may be needed.
2. EQAC feels that the current programs need to be replicated in many other areas of the county.	A new program will require a fresh look at the mechanics of this process. Subject to the design of a new program, efforts will be directed to expand the number of trained volunteers and of cooperating property owners.	A new program needs to be undertaken. Some additional resources will be needed to bring it to the desired level.	No.
3. EQAC recommends enhanced public education outreach to sensitize Fairfax County residents to the pollution problems caused by geese and the programs available for addressing them.	The Animal Services Division will be working in cooperation with state and federal officials to gather data on the effects of resident goose populations upon local tidal marshlands in Fairfax County. This information will be provided to the public through existing methods. The division has worked with Channel 16 to produce programming, which covers Canada geese, and the issues related to them.	This part of the program is being pursued at a level consistent with the funding available. Some additional resources will be needed to bring it to the desired level of outreach.	In process.
4. EQAC recommends enhanced public outreach to acquaint Fairfax County residents with the destructive role excessive goose populations play in our marshland habitats.	The Animal Services Division is presently developing a goose management program to replace the program formally known as GeesePeace. The Fairfax County Wildlife Biologist provides information about all available options and programs to property owners through telephone and e-mail contacts. A new Web site will be developed to better convey current information and available management options.	This part of the program is being pursued at a level consistent with the funding available. Use of various media to provide educational material to the public has been excellent. However, some additional resources may be needed to bring these activities to the desired level.	In process.

VII-3. WILDLIFE BORNE DISEASES OF CONCERN IN FAIRFAX COUNTY

Wildlife Borne Diseases Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. EQAC recommends that the BOS provide continued active support to the reorganized Stream Monitoring Program in which the Stream Protection Strategies Program of the DPWES will perform sample collection and field testing and the Health Department will perform lab testing and analysis functions. EQAC recommends that the county staff ensure the posting of advisories on the county Web site when polluted waters are identified.	Fairfax County changed from using fecal coliform bacteria to E. coli as an indicator of possible fecal contamination. This combined with updated procedures to determine E. coli levels will increase the precision of the results and reduce the amount of human error. The county's Annual Report on Fairfax County's Streams (including biological stream monitoring results) is available for download from the county's Web site. News releases for local and regional newspapers on information related to the annual report and stream advisories will be prepared by the county's communication staff. The news release will be posted on the county's Web site.	The reorganized stream monitoring program appears to be working well and more efficiently than before.	Yes.
2. The Health Department should continue and enhance its excellent public education programs.	This recommendation is continuing to be implemented and enhanced as EQAC has recommended. During the summer of FY2005-FY2006, the West Nile Virus program distributed over 175,000 pieces of educational information material to residents.	This recommendation is being very satisfactorily addressed.	Yes.

Wildlife Borne Diseases Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. The Police Department should continue its animal control program and, in conjunction with the Health Department, expand public education initiatives in key areas such as rabies and wildlife contributions to pollution of surface waters.	The Animal Services Division routinely provides the public with information on rabies and other wildlife borne diseases. Rabies is addressed on the Animal Services Web page. Both the Health Department and the Animal Services Division participate in the Animal Control Regional Roundtable. This is a group compiled of representatives from the animal control departments and health departments of various jurisdictions throughout the region. This group has chosen to expand the topics of discussion beyond rabies to include all wildlife diseases.	This recommendation is being very satisfactorily addressed.	Yes.
4. EQAC recommends that the BOS provide active support for the Disease Carrying Insects Program that assesses the epidemiology and abatement of insect vector-borne diseases such as West Nile Virus. EQAC also recommends that the BOS monitor this program.	This recommendation is being addressed. The BOS has provided and continues providing support for the Disease Carrying Insects Program. The Health Department provided periodic reports on the program and the Health Department periodically informs the BOS in more direct manners.	This program appears to be progressing satisfactorily.	Yes.

VIII-1. NOISE

Noise Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. Continue to support airport noise compatible (day and night) and compatible land use planning near airports in the county. Proposals for rezonings for residential development should not be supported in areas with projected noise impacts of DNL 60 dBA or greater.	This recommendation has been addressed. Comprehensive Plan policy recommends against new residential development inside the DNL 60 dBA noise contour.	The recommendation has been addressed.	Yes.
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.	This recommendation has not been addressed and is not in progress. Pursuit of EQAC's recommended educational efforts would be desirable but would need to be considered in terms of overall resources available for this and other demands on staff resources.	EQAC continues to recommend a public education program.	No.
3. Encourage the use of opportunities provided by the Virginia Department of Transportation (VDOT) that allow for third party contributions to noise barrier construction when the VDOT cost criteria preclude VDOT's construction of such barriers.	VDOT adopted a Noise Abatement Policy based upon Federal Highway Administration regulations. The State Noise Abatement Policy provides opportunity for third party funding when the cost of a noise abatement measure exceeds VDOT's cost effectiveness ceiling but the measure otherwise satisfies the criteria contained in this policy.	Fairfax County should continue to use its proffer authority with developers to provide noise abatement measures and/or funding mechanisms to provide noise abatement measures consistent with VDOT noise abatement specifications. Fairfax County should also continue to coordinate with VDOT to determine where sound walls are already planned as part of a VDOT road construction project, which may offset abatement costs for the developer and/or VDOT.	In process.

Noise Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
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.	Narrow bands of trees are ineffective as noise barriers and only provide psychological benefit. For a vegetated area to have a significant impact on noise, it must be dense enough so that it cannot be seen through and wide enough to provide a significant benefit. Staff agrees with EQAC's recommendation to preserve and plant trees where possible adjacent to highways, generally in addition to, rather than instead of, more traditional structural barriers.	EQAC supports retention and planting of noninvasive vegetation.	In process.
5. 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.	Staff concurs with this recommendation and is addressing it on a continuing basis as NEPA-related documents are issued. For example, staff provided reviews of Draft and Final Environmental Impact Statements for proposed new runways at Washington Dulles Airport and reviewed Environmental Impact Statements (including sections on noise) for the Tri-County Parkway and Battlefield Bypass.	EQAC supports the staff in reviewing NEPA-related documents as they are issued.	Yes.

VIII-2. LIGHT POLLUTION

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1a & 1b. EQAC recommends that the Board of Supervisors ensure that the Fairfax County Public Schools and the Fairfax County Park Authority fully comply with the new [outdoor lighting] ordinance and consistently follow the recommendations of the Illuminating Engineering Society of North America. EQAC further strongly recommends that the Board of Supervisors appoint a small independent task force to develop recommendations and specifications for athletic field lighting throughout the county, and that these be used to amend the ordinance.	1a. It is the policy of Fairfax County Park Authority to ensure that all new and replacement lighting projects comply with the county's new Outdoor Lighting Ordinance, and follow the recommendations of the Illuminating Engineering Society of North America. In November 2004, the Park Authority commissioned an independent technical consultant to (1) research currently available lighting systems, (2) provide a comparative analysis, (3) provide a report summarizing the study and findings, and (4) develop generic technical specifications for athletic field lighting projects. The resulting draft report was presented at a public meeting on November 17, 2005. The Park Authority believes that this study was developed and conducted in a professional manner. Therefore, it does not see a need for another study. 1b. Fairfax County Public Schools is compliant with the new lighting ordinance, both for new projects and for fixtures being replaced for maintenance reasons.	The new Outdoor Lighting Ordinance, while excellent in most respects, has one major deficiency. At the time of adoption, good standards for glare (as opposed to illumination on the ground) did not exist and were not included in the ordinance. EQAC believes that the study done for the Park Authority is flawed. For example, it does not adequately address glare. The failure to address glare is a problem with the lighting fixtures of the Fairfax County Public Schools.	No.

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
2. EQAC recommends that the board of supervisors direct that exterior lighting fixtures installed on Fairfax County facilities and properties be consistent with the new [outdoor lighting] ordinance. EQAC recommends that the board of supervisors direct that all older lighting fixtures under county control that do not meet the above standards be replaced on a phased basis.	All new exterior lighting fixtures installed on Fairfax County facilities and properties are required to, and will adhere to, the new ordinance. The retrofitting of the 500 to 600 older exterior lighting fixtures located at county facilities is not being pursued at this time as a stand-alone initiative. There are no funds available for the initial conversion of these existing light fixtures. However, if existing facilities are modified or renovated, these existing exterior lights will be upgraded to current standards.	EQAC still believes that a phased replacement of nonconforming light fixtures is warranted. Replacing nonconforming fixtures with conforming fixtures as these fixtures are modified or renovated will help.	Yes for new fixtures, but only partially for existing fixtures.
4. EQAC recommends that the Board of Supervisors continue to monitor and evaluate the effectiveness of the recently enacted Outdoor Lighting Ordinance to determine any areas in which enhancements and modifications may be needed.	The new ordinance became effective on June 17, 2003. County staff monitors the effectiveness of these standards and have found that the outdoor lighting regulations are overall effective in controlling glare and reducing light levels in certain commercial developments. Staff recommends that a comprehensive review of these lighting standards be conducted within the next several years.	This recommendation is being very satisfactorily addressed. However, EQAC notes that glare needs to be covered by an amendment to the ordinance.	Yes, but glare needs to be addressed.

Light Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
5. EQAC recommends that the Board of Supervisors support county staff efforts to develop any additional technical information that may be needed for the education of architects, contractors, electricians and builders as to what the county permits and does not permit in the field of illumination and the technology available for compliant installation.	A booklet entitled "A Guide to Fairfax County's Lighting Standards" was prepared by staff and distributed in September 2003. This booklet provides an overview of the outdoor lighting standards.	This recommendation continues to be very satisfactorily addressed.	Yes.

VIII-3. VISUAL POLLUTION AND URBAN BLIGHT

Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
1. 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.)	Va. Code Ann. § 15.2-2209 specifically provides that designation of a specific zoning violation for a civil penalty shall be in lieu of criminal sanctions, except for a violation resulting in injury to persons, and precludes prosecution of that specified violation as a misdemeanor in a criminal case. The BOS is considering entering into an agreement with the Commonwealth Transportation Commissioner which would permit the county to enforce the provisions of Va. Code Ann. § 33.1-373, which prohibits advertising in the public rights-of-way.	It is encouraging that the BOS is considering establishing an agreement with the Commonwealth Transportation Commissioner that would permit the county to enforce the provisions of state law regarding signage unlawfully placed in the right-of-way. EQAC encourages this approach.	No.
2. EQAC strongly urges the BOS to again consider the Fairfax County Sign Task Force report and either implement its findings or reconstitute the task force to find alternatives that are more palatable to the board and the citizens of the county.	The Virginia General Assembly did adopt an amendment to Virginia Code as recommended by the task force that provides authority for Fairfax County to enter into an agreement with the Commonwealth Transportation Commissioner to enforce the section of the Virginia Code that prohibits advertising within the limits of any highway. However, this enforcement agreement will not apply to political signs and special event signs that may remain in the right-of-way for no more than three days after the election or special event.	EQAC reiterates its support of the general premises underpinning the task force recommendations.	Partial.

Visual Pollution Recommendations	Action taken by Agency or Department	EQAC Comments	Completed
3. EQAC supports the general premise underpinning each of the Fairfax County Sign Task Force's recommendations, but believes that before the county seeks any amendments to the Code and introduces new programs of its own, a study should be performed to determine the impact on existing programs, staffing, and budget, and that a cost benefit analysis be performed to determine the extent to which the proposed amendments or additions would contribute to reducing visual pollution in a cost-effective manner.	As part of the development of this sign enforcement program, staff will identify the impacts on existing programs, staffing and budgetary considerations. This information will be presented to the board of supervisors. A cost benefit analysis for a sign removal program may be conducted upon the conclusion of the first year of the program.	EQAC reiterates its recommendation.	In process.

CHAPTER I

LAND USE AND TRANSPORTATION

I. 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 growth[2], yet congestion has still increased. This is due to increased per capita vehicle mileage that puts severe strains on the transportation infrastructure. The cost of congestion in the region was estimated at $667 per person in 2001, up from $320 in 1991.[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 region from using 75 million gallons of gasoline each year.[4] Public transit is clearly an important part of the future.

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[1] Fairfax County Comprehensive Plan, 2003 Edition, Land Use Chapter
[2] "Where We are Growing", Southern Environmental Law Center, 2002
[3] Texas Transportation Initiative, 2003 Urban Mobility Study
[4] Washington Metropolitan Area Transit Authority, www.wmata.com/about/metro_matters/MMfactsheet.pdf

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. This year 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.

Due to a variety or 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. With increased population and density in the county, the two domains need to be brought closer together. Land use decisions directly effect 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 that 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.

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

[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, at http://www.greenbelt.org/downloads/resources/report_smartinfill.pdf

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 Condominiums[8] 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:

- 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.

[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

This induces disproportionate transportation needs that can lead to congestion and the associated increase in air pollution and vehicular waste. Tools and analysis such as **Transportation Demand Management** are being used to plan and focus transportation needs across multimodal systems and to provide mixed use services in close proximity to the density. TDM is a key component to manage this macro effect.

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 Metro 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 then 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

Technology has become an important tool for understanding the impact of development and to plan for changes. Fairfax County has created an impressive Information Technology infrastructure to help understand the county and the 395 square miles of land it contains. The Geographical Information System provides a capability to "see" the county through maps, imagery and other geospatial data. 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 basic 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—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 make projections about the future—these are becoming increasingly important.

Over the past several years, EQAC has advocated for an enhanced IT capability for tracking land use. Last year, working with staff, EQAC recommended that the county adopt a new parcel-based system that would track the full lifecycle of each parcel in the county. This new system, called the Integrated Parcel Lifecycle System, is now being implemented. This is an important step towards better understand how land in the county is used and how it changes over time.

This information managed by IPLS includes population and housing unit estimates and forecasts, which are 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.

As staff considered the IPLS requirements, an informal survey was conducted of the GIS users who would benefit from the parcel based system and additional data about the parcels. Over 38 users from across the county responded indicating a critical need for the system and more data. Some examples:

- Board of supervisors—resident concerns and land use issues
- Parks—development planning, natural and cultural resource inventory
- Department of Planning and Zoning—evaluation, enforcement, appraisal, plan reviews
- Public Safety—planning for fire and rescue, hazardous spill impacts, crime mapping, improved dispatch
- Public Works—project design and evaluation, stormwater runoff calculation, flood and dam breach emergency plans, solid waste services
- Transportation—pedestrian planning, VDOT permit applications

These uses 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.

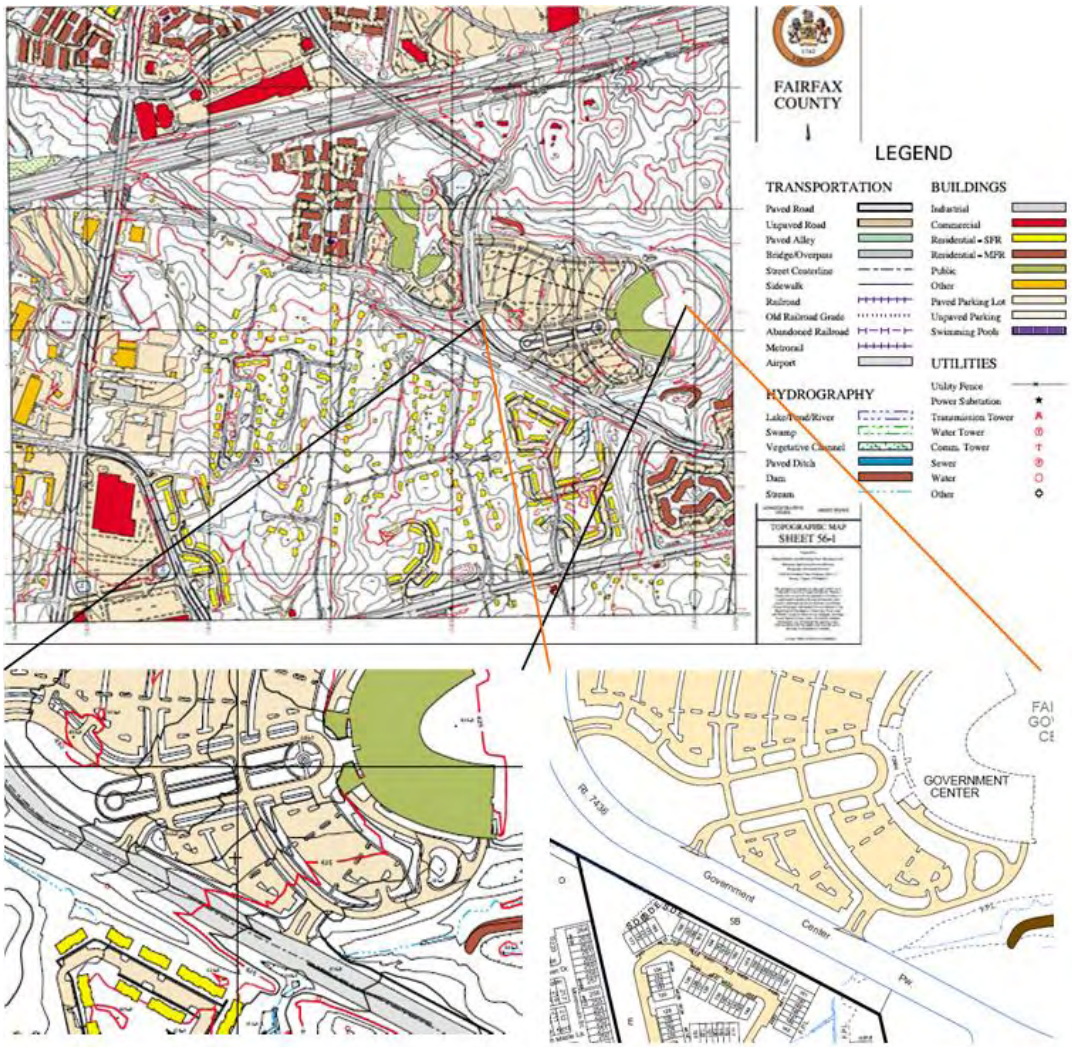
EQAC commends the county for its leadership in adopting technology and, more importantly, for using it to improve service. With the IPLS system underway, EQAC is focusing on the data, models and applications that will improve the county's land use and transportation planning capability. The three areas EQAC is most concerned with are:

- 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.
- Models—leveraging planimetric and oblique data with models that analyze the data and provide valuable information.

1. 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 I-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 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.

2. 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 I-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.

3. Models and Projections

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.

4. Land Use Information Accessibility Advisory Group

The Land Use Information Accessibility Advisory Group was chartered with the mission to review the availability and accessibility of land use information on the county's Web site. As a result of this review, the advisory group will advise the board of supervisors, the county executive and county staff on short and long term solutions to improve the availability of land use information to the public. The advisory group began meeting in April 2006 and has had the opportunity to meet with county staff to see how land use information is currently being disseminated on the Internet. Through these meetings, the group has made suggestions for improving the various information portals, some of which have already been incorporated. These have included making searches for permits issued or rezoning requests more efficient (e.g. searching by address rather than by Tax ID number), or the ability to search within proximity of an address. Future improvements are likely to include enhancements to the county's "My Neighborhood" application that is currently on the county's GIS Web site, or the integration of GIS into other Web applications such as LDSNET. The Land Use Information Accessibility Advisory Group will be finalizing its recommendations in the beginning of 2007.

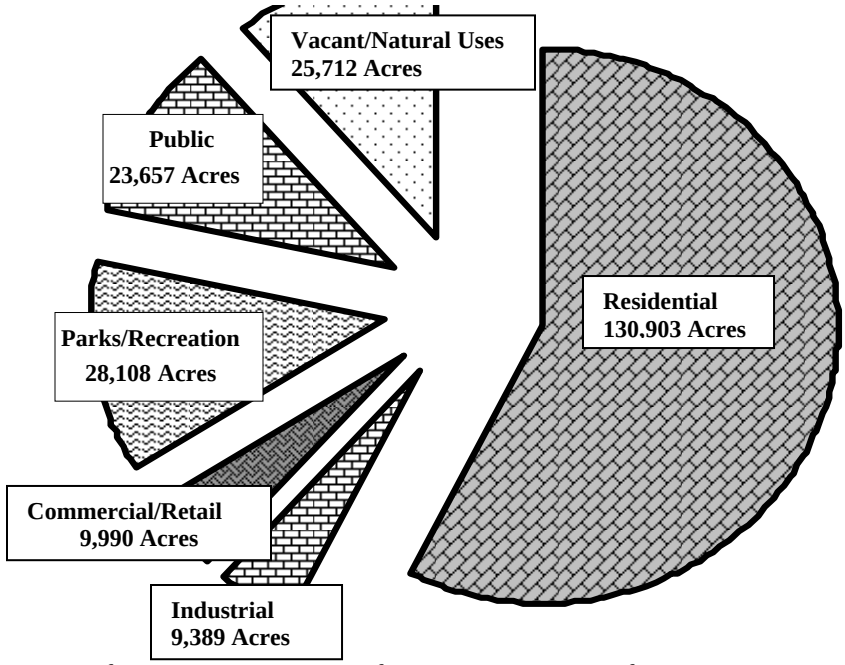
B. LAND USE

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?

Land use in Fairfax County is analyzed yearly via the Urban Development Information System and, going forward, will be captured in the Integrated Parcel Lifecycle System. This section uses 2004 data from UDIS. 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 I-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

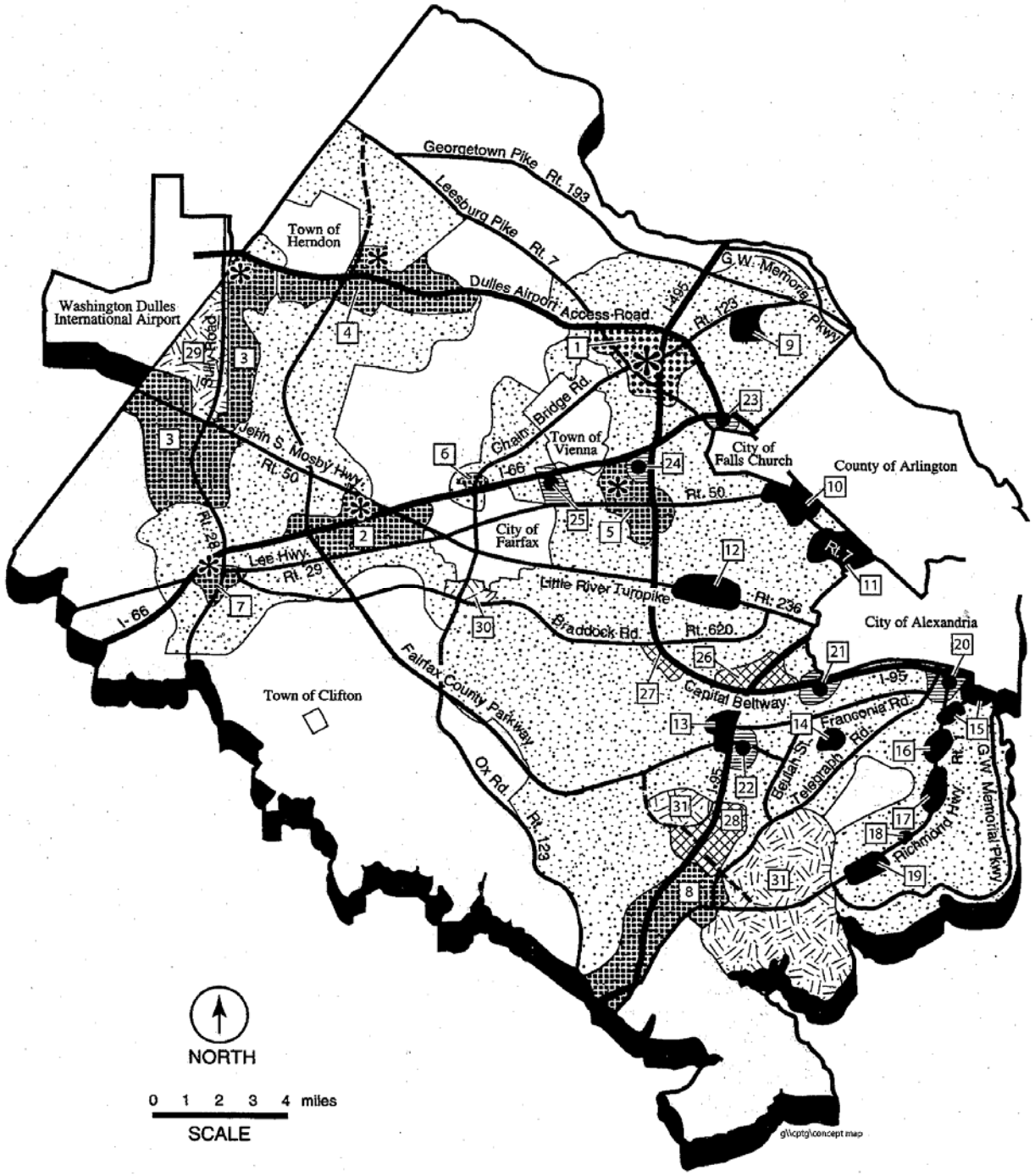
The Fairfax County Comprehensive Plan is a guide for making land use decisions in Fairfax County. Major Plan revisions took place in 1975 and 1991. The 1991 Plan, that is the foundation for the current 2003 edition, was developed around 18 Goals for Fairfax County (a 19th goal was added later). The 2003 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 1-4). 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.

Figure I-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 Dorn 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

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.

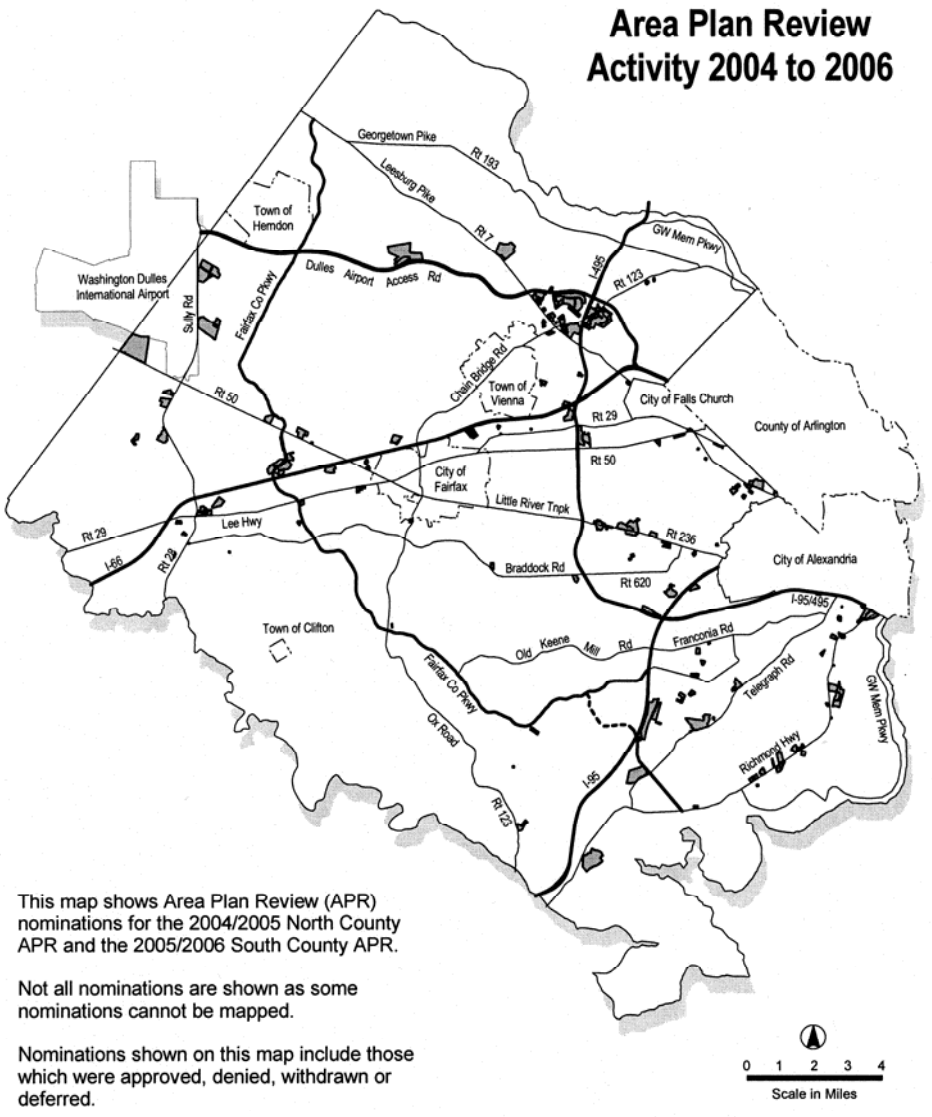
The APR task force for each district is appointed by the district supervisor. Each task force reviews proposed changes at a public hearing and submits a recommendation to the Planning Commission. This is accompanied by a staff recommendation that may or may not concur with the task force recommendation.

Figure I-5 provides an overview of the Area Plan Review activity for the most recent North County and South County APR processes. The 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.

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.

Figure I-5.



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 I-1. In 2004, with only approximately 11% 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 I-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 I-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 I-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 is shown in Table I-3. All vacant and natural land will be developed or become parkland. The ratios between the types will change, with the residential increasing to 63 percent overall.

The table also includes an estimate of the vacant or underutilized acreage within each type. "Because of the complexities involved in determining whether nonresidential land is underdeveloped, estimates of underdeveloped acreage are only made for residential land."[10]

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. For purposes of

[10] Fairfax County Demographic Reports, 2004

Table I-3 Planned Land Uses				
Land Use	**Planned Acreage**	**Percent of Total Land in the County**	**Vacant/Underutilized Land**	**Vacant Land as a percent of Planned Acreage**
Residential	143,496	63.0 percent	22,505	15.7 percent
Industrial	8,290	3.6 percent	2,326	28.1 percent
Commercial	5,259	2.3 percent	710	13.5 percent
Public Facilities and Mixed Use	26,725	11.7 percent	1,356	5.1 percent
Parks, Recreation, Floodplains	43,852	19.3 percent	3,779	8.6 percent
Vacant and Natural	-	-		
TOTAL	227,622	100.0 percent	30,676	13.5 percent
Source: Fairfax County Demographic Reports, 2004				

allowing for a comparison of existing and planned development levels, Table I-4 shows the "existing conditions" for both nonresidential and residential development as they existed in Fairfax County in the years 1990, 1994 and 2002.

Residential and nonresidential growth in Fairfax County is expected to continue, and the county's Comprehensive Plan anticipates and guides this growth. Table I-5 presents one potential Comprehensive Plan "buildout" scenario based on Comprehensive Plan options that would serve to maximize residential development (as opposed to options that would maximize nonresidential development) in mixed use employment centers. This scenario is presented applying Comprehensive Plan guidance as it existed in 1989, 1991, 1995 and 2003. Prior to the Area Plan revisions in 1991, nonresidential potential could not be quantified due to lack of specific nonresidential development intensity guidance in the Comprehensive Plan; as such, nonresidential Plan capacity information is not provided for the year 1989.

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 I-5, 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 I-5 have increased since 1991.

Table I-4 Existing Land Uses in Fairfax County: 1990, 1994 and 2002			
Land Use	**1990**	**1994**	**2002**
Nonresidential (figures given in square feet of floor space, rounded to the nearest million)			
Office	67,000,000	75, 000,000	98, 000,000
Retail	33, 000,000	39, 000,000	47, 000,000
Institutional	29, 000,000	31, 000,000	37, 000,000
Industrial	34, 000,000	36, 000,000	40, 000,000
Total Nonresidential	**163,000,000**	**182,000,000**	**221,000,000**
Residential (figures given in dwelling units, rounded to the nearest hundred)			
Single Family Detached	163,000	169,700	184,200
Single Family Attached (e.g., Townhouses)	67,300	74,600	90,500
Multifamily	72,100	77,700	96,000
Total Residential	**302,500**	**322,000**	**370,600**
Source: Fairfax County Department of Planning and Zoning, 2004			

Table I-5 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				

The increase in buildout planned residential development levels, under the scenario presented in Table I-5, is summarized in Table I-6:

Table I-6
Residential Development : Plan Build Out, 1989-2003

Land Use	1989 Plan	1991 Plan	1995 Plan	2003 Plan	1989 - 2003 Change	1989 - 2003 Percent Change
Single Family Detached	216,100	212,200	212,800	215,200	(900)	**-1 percent**
Single Family Attached	78,600	82,700	86,200	88,900	10,300	**13 percent**
Multifamily	83,200	114,400	140,600	153,500	70,300	**84 percent**
Total	**377,900**	**409,300**	**439,600**	**457,600**	**79,700**	**21 percent**

Table I-6 clearly shows that the 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.

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 I-6. Major portions of the Beltway, I-66 and the Fairfax County Parkway already have a failing LOS.

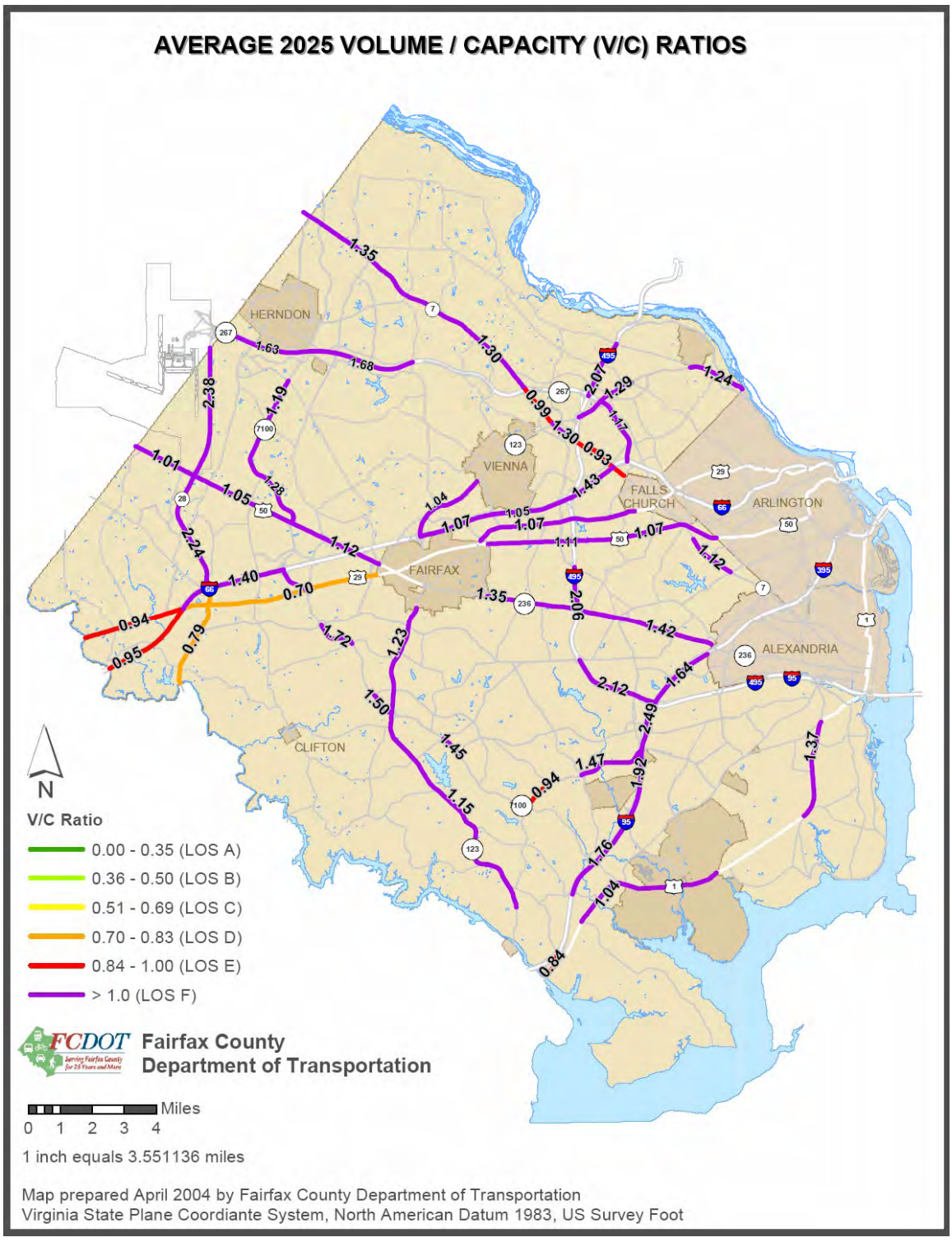
Projected V/C ratios for 2025 are shown in Figure I-7. This information considers population growth and settlement projections. Comparing the current V/C ratio map with the future V/C ratio map provides many insights into how the transportation infrastructure grows with population. Some observations:

- 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 I-6.

Source: Fairfax County Department of Transportation

Figure I-7.


AVERAGE 2025 VOLUME / CAPACITY (V/C) RATIOS
HERNDON
VIENNA
FALLS CHURCH
ARLINGTON
FAIRFAX
CLIFTON
ALEXANDRIA
N
V/C Ratio
0.00 - 0.35 (LOS A)
0.36 - 0.50 (LOS B)
0.51 - 0.69 (LOS C)
0.70 - 0.83 (LOS D)
0.84 - 1.00 (LOS E)
> 1.0 (LOS F)
FCDOT
Fairfax County
Department of Transportation
Miles
0 1 2 3 4
1 inch equals 3.551136 miles
Map prepared April 2004 by Fairfax County Department of Transportation
Virginia State Plane Coordiante System, North American Datum 1983, US Survey Foot

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.[11] 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 I-7), with another 17 percent working in the District of Columbia. Similarly, most of the workers in Fairfax County live in Fairfax County (see Table I-8); 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. Metro is a good example of denser transportation in a smaller footprint.

[11] http://www.smartergrowth.net/vision/regions/region.html

Table I-7 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[12]		

Table I-8 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 Metro right of way is a much thinner with a higher peak capacity. As the

[12] 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 VDOT 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 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.

An example of a coordinated project is the Columbia Pike Transit Alternatives Analysis (Pike Transit Initiative), which is a study that was sponsored by the Washington Metropolitan Area Transit Authority in conjunction with Arlington County and Fairfax County. The study analyzed alternatives for a new high-capacity and environmentally friendly transit service along Columbia Pike from the Pentagon/Pentagon City area to Baileys Crossroads. Working closely with local jurisdictions, neighborhoods and community groups, the study team developed a preferred transit investment for the corridor that will support the county's redevelopment initiatives.

The Pike Transit Initiative describes the preferred "modified streetcar" alternative – an initial streetcar line with supporting bus service – recommended by the study team to be carried forward into the next phase of the project development process. On April 26, 2006, the Arlington County Board unanimously endorsed the Modified Streetcar Alternative as the preferred transit alternative for the Columbia Pike corridor. The Fairfax County Board of Supervisors also endorsed the Alternative on May 1, 2006. These actions permit the project to advance into the next phase of development, which includes environmental documentation, development of a financial strategy and conceptual system design.

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 Metro 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 Metro, the Virginia Department of Transportation and the county's Department of Transportation, and will review and provide comments during the Dulles Corridor rapid transit stations access planning process. In addition, the FCDOT is conducting a study to inventory and improve bus stop access and safety. The county's Pedestrian Program Manager should review and comment on Metro station studies and the related rezoning and special exception applications to improve the pedestrian access and safety to those facilities. Convenient and safe pedestrian access will encourage more people to use transit facilities, therefore reducing vehicular usage and related pollution in the environment.

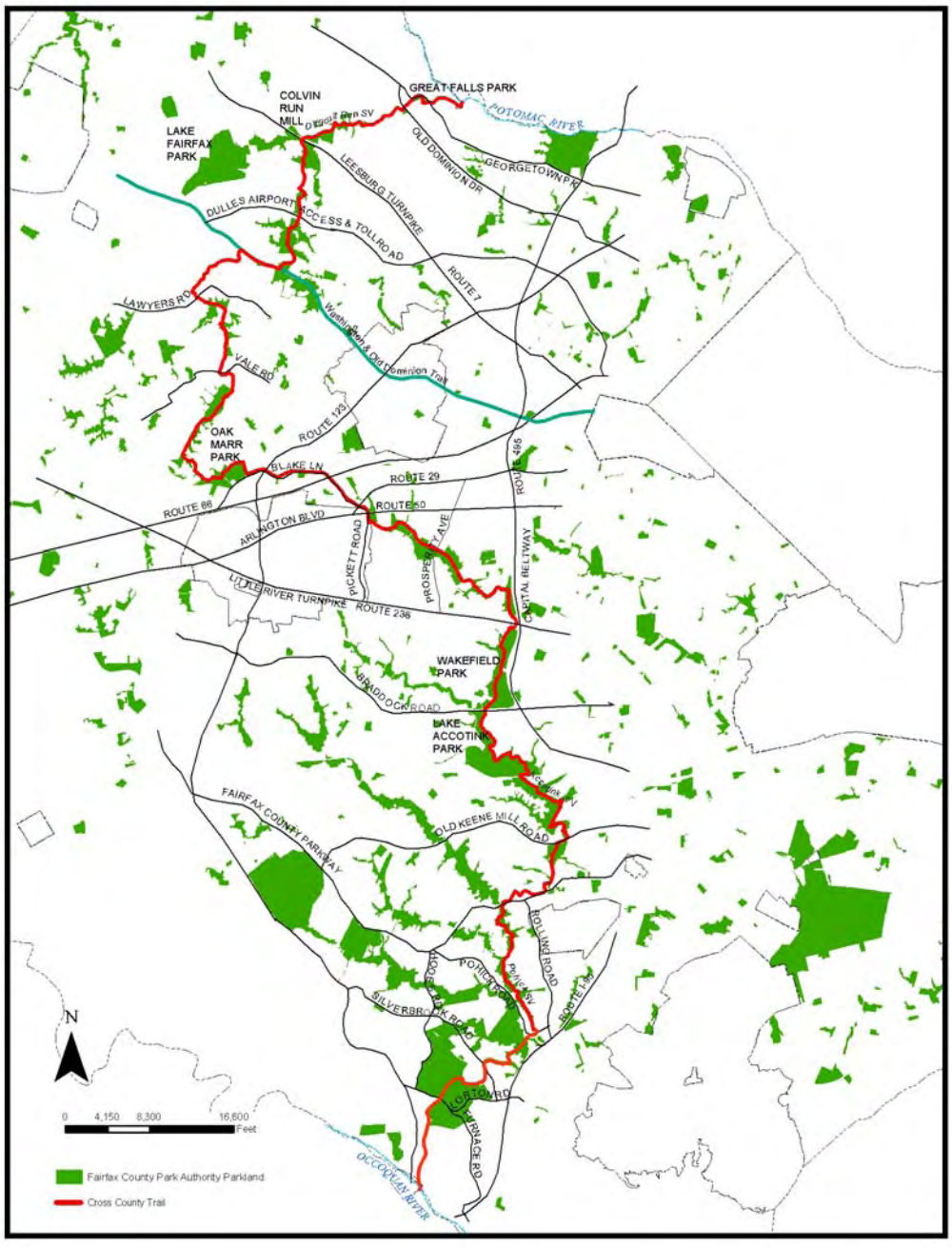
In the past, the board of supervisors has provided funding to the Trails and Sidewalks Committee by magisterial district for trail projects. Such funding has been limited due to budget reductions. However, in 2004, county voters approved a $165 million General Obligation Bond Referendum as part of the board's four-year Transportation Plan. Within the Plan, $10.8 million was designated to fund countywide pedestrian improvements such as sidewalks and trails, improvements for bus stops and crosswalks and pedestrian improvements for the Richmond Highway Initiative.

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 6 years of work the Cross County Trail (Figure I-8) was completed in December 2005 for a ribbon cutting ceremony. This milestone trails project was celebrated with the event Trailfest on May 6, 2006 with more than

Figure I-8: Cross County Trail



Source: Fairfax County Park Authority

10,000 residents participating in the day-long festivities. Steps toward the completion during 2005/2006 included:

- Completing the Accotink Stream Valley trail from Americana Park to King Arthur Drive, covering more than a mile of trail and three stream crossings.
- Installing three fiberglass bridges, one installed with volunteer labor.
- Adding stone to sections of the trail.
- Installing more than 80 mile and half-mile markers.
- Opening the Laurel Hill Greenway section of the CCT well ahead of project schedule.

It is difficult to predict how many commuters will use the trail, but the trail's completion makes possible connections to Metro 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.

In addition to the CCT, trails greater than a mile in length were opened in Stratton Woods Park; an additional link was opened within the Middleton Farm/Horsepen Run Stream Valley system: and a segment of trail was opened in Indian Run Stream Valley.

The Fairfax County Pedestrian Task Force started work in 2004 with a mission to develop a plan for implementing safe and effective pedestrian facilities and to develop a coordinated and collaborative education/outreach program. The task force's final report was presented to the board of supervisors on January 23, 2006. The report targeted a list of priority safety education and capital improvement recommendations. In the report, the task force said its work is intended to foster an improved environment for pedestrians in the future and lay the foundation for realistic future improvement programs to benefit all Fairfax County residents. The task force said in the report that it is hoped that in the near future Fairfax County can: (1) continue to reduce the number of pedestrian/vehicle collisions and their associated deaths and injuries; (2) provide residents a safe, accessible and practical alternative to using a car for local trips; and (3) allow children living within walking distance of their schools to have safe walking routes to school. The final report is available at: www.fairfaxcounty.gov/fcdot/pedestrian.htm.

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 in 2005. By the end of 2005, the county had met its goal of 1,000 teleworkers (a number that is based on the Council of Government's goal of 20 percent of the regions' eligible workforce teleworking by 2005). By meeting this goal, it is estimated that county teleworkers potentially saved 59,000 commuting hours and 1.8 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.

c. Community Residential Services Program

This program partners with multi-family complexes, area developers and civic organizations to facilitate the creation and implementation of Community Transportation Programs. These programs have been shown to increase the attractiveness of a residence and impact decisions on where to live. The Community Residential Program promotes telecommuting and the use of mass transit, carpools, vanpools, biking and walking instead of drive-alone commuting.

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 Metro 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 outlines projects that have combined elements of land use and transportation via special studies or revitalization districts that incorporate mixed use and transit oriented development.

The establishment of Urban Centers, Suburban Centers and Transit Station Areas (as shown in the Concept Map for Future Development) in critical locations in the county is a fundamental prerequisite to achieving many of those objectives. Significant effort is now focused on the Tyson's Corner Urban Center, where plans call for four additional Metro stations. By preparing and planning for future development, the county is making progress towards integrating land use and transportation.

a. Tysons Corner Urban Center

Over the last several decades, Tysons Corner has evolved from a rural crossroads into a substantial suburban business center. The Comprehensive Plan recognizes Tysons Corner as the only area in Fairfax County that is classified as an Urban Center. The Comprehensive Plan envisions a Tysons Corner Urban Center that contains a mixture of high density office, retail and residential uses and parks (including urban parks and active recreation facilities) in a pedestrian-oriented urban environment.

In May, 2005 the board of supervisors appointed a coordinating committee, now known as the Tysons Land Use Task Force, for Tysons Corner. Its mission is to coordinate community input and make recommendations to update the 1994 Tysons Corner Comprehensive Plan to incorporate the four planned Metro stations into the Plan and achieve the following:

- Promote mixed use.
- Better facilitate transit-oriented development.
- Enhance pedestrian connections throughout Tysons Corner.
- Increase the residential component.
- Improve the functionality of Tysons Corner.
- Provide for amenities and aesthetics, such as public space, public art and parks.

The Tysons Land Use Task Force has produced three significant reports so far:

- An update to the Major Planning Objectives for Tysons Corner.
- A Community Outreach Report that solicited input from a broad spectrum of Tysons Corner stakeholders and identified community values, issues and concerns to be considered in developing principles and concepts for change.
- A set of Guiding Planning Principles for shaping and evaluating alternative land use scenarios.

The task force also solicited assistance from a world class urban planning firm to develop alternative land use designs following the guiding planning principles. The board of supervisors fully supported the task force with the

hiring of the consultant; this process will bring experience from across the world to bear on the Tysons Corner plan.

At the same time, the state is moving forward with building rail through Tysons Corner to Dulles. These two projects are closely related, but are not working together because they report to two different authorities. The county is responsible for land use and the state is responsible for transportation. Recently, the county encouraged the state to consider a tunnel through Tysons Corner instead of the proposed aerial route. This had many advantages, such as improved opportunities for land use planning, better overall transportation throughput by separating rail pillars from the street grid and less impact on the existing infrastructure during construction. The Governor decided against the tunnel due to possible delays to the construction schedule and concerns raised at the federal level regarding additional project reviews.

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 Fairfax County Comprehensive Plan integrates land use and transportation planning for the area from Tysons Corner to Dulles Airport based on the expectation that rail service through Tysons Corner to Dulles Airport will be constructed.

The Dulles Metrorail is a new 23-mile Metrorail line, extending service from the existing Orange Line at the East Falls Church station to Route 772/Ryan Road in Loudoun County. The project environmental reviews are completed and the Virginia Department of Rail and Public Transportation has begun the preliminary engineering process. Construction is expected to start in 2007.

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.

The 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 Metro 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.
- Comprehensive transportation planning to include transit oriented development, street grids, pedestrian access, mass transit.

d. Transit Station Areas

The county contains six Metro transit stations with four more slated for Tysons Corner and additional stations stretching through Dulles Airport along the Orange Line. These Metro stations are evolving into the transportation hubs for the county. Redevelopment can be seen at each Metro station. At both the Vienna and Dunn Loring-Merrifield Metro 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 Metro include:

- Metro 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 Metro 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 Metro 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 then 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.

- Moving forward with the Integrated Parcel Lifecycle System to replace UDIS and integrate land use data into the county's award winning GIS system.

- 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 notes the county's success with telework and recommends that the county build upon this success. EQAC encourages the county to publicize this success 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. The county should provide guidance regarding its best practices.

2. Improve Transit Utilization

EQAC recommends that the county focus on improving transit utilization through a systematic plan that focuses on 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 will provide the 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 also encourages the county to continue to enhance and expand the data warehouse.

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.

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:

a. Evaluate the State of 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 1995-2005 and assess impacts through 2025. 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.

b. Assess the state of the county with respect to the Planning Land Use System Principles set forth in 1975 and the reality 30 years later. The PLUS Principles and planning approach were designed to achieve the following:

    - To increase local employment (in a period when Fairfax County was still primarily a bedroom suburb on the fringe of the urban core).
    - To decrease reliance on the private automobile by reducing the length of work trips and making mass transit facilities more easily accessible.

- To reduce pressure for development in environmentally sensitive areas.
- To preserve stable neighborhoods.
- To lower costs by more efficient provision of public services.

The Comprehensive Plan provides guidance to balance these competing goals. This assessment will 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.

2. Data and Modeling

a. EQAC recommends that the county acquire the expanded set of planimetric data and continue to acquire oblique imagery. EQAC understands the costs associated with data acquisition and management, but believes the benefits are justified. 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.

b. EQAC recommends that the county begin leveraging three-dimensional models into 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 overlain 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. The county should also require Transportation Demand Management studies and plans for significant new development projects.

3. Encourage Better Environmental Practices

EQAC recommends that the county adopt ordinances, incentives and proffers that encourage Green Building and energy conservation practices.

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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

Walkable Communities:
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

CHAPTER II

AIR QUALITY

II. AIR QUALITY

A. ISSUES AND OVERVIEW

1. Introduction

Over the last several years, Fairfax County has demonstrated its commitment to being an active partner in improving the region's air quality. In the past, the Environmental Quality Advisory Council recommended that county staff become more involved in regional planning efforts and that recommendation has been followed. In February 2003 the county executive issued a "Declaration on Air Quality Leadership". Then in the spring of 2003, the Environmental Coordinating Committee chartered an Air Quality Subcommittee composed of cross-agency staff members and tasked them with developing an air quality management plan for the county in cooperation with EQAC. County staff proceeded with this effort and in February 2004 the AQS held a public meeting to present and discuss their conceptual recommendations. Using the county residents input, the committee developed the 2004 Air Quality Protection Strategy Recommendations Report along with a Clean Air Café Menu. These April 19, 2004 documents were presented to ECC, EQAC and the environment committee of the board of supervisors. While EQAC understands that not all of the recommendations can be implemented immediately, EQAC encourages the board of supervisors to implement all of the recommendations in the report. EQAC is pleased with these efforts taken by the BOS and county staff to promote and encourage clean air initiatives and practices. Below is a list of some of the recommendations that have already been implemented. Several of the recommendations were even included as part of the commonwealth of Virginia's Air Quality Severe Area State Implementation Plan submitted March 1, 2004 to meet the Clean Air Act requirements. These efforts clearly demonstrate the board's leadership and commitment to the idea of clean air excellence. Unless otherwise noted, the information shown below was current as of August 2006.

- Diesel retrofits: To date the board of supervisors has approved reprogramming of the electronic controls on certain school bus engines and installation of diesel oxidation catalysts on school buses and other diesel powered county equipment. A contract for the school buses was awarded in April 2004 and the last bus was completed in February 2005. In all, 1,012 buses were retrofitted which is projected to reduce NO_x emissions by 175 tons and hydrocarbon emissions by 30 tons over the remaining life of the buses. Another contract was awarded in June 2005 to install diesel oxidation catalysts on over 100 heavy-duty trucks and this work was finished in February 2006. The next planned diesel oxidation catalyst work will be done on the county's fire trucks. Funding for these efforts came from $2 million the board of supervisors approved at the FY 2003 Carryover Budget for emission reduction programs along with grant funds totaling $1.095 million. In addition, funds in the amount of $1.5 million have been made available for the retrofit of the Connector buses with the catalyzed diesel

particulate filters. Four buses have been retrofitted in a pilot project and 91 more should be complete by the end of 2007.

- Telework on Code Red Days: The board of supervisors and the county executive continue to champion this effort on the part of county employees. Approved teleworkers are encouraged to telework on Code Red Days even if they were not scheduled to telework on that day. Currently (May 2005), more than 750 county employees telework two to four days per month. An expansion effort has been underway to raise that number to 1,000 by the end of 2005. Telework expansion reflects the Fairfax County Board of Supervisors' adoption of the regional goal set by the Metropolitan Washington Council of Government – to reach a level of 20 percent of the eligible workforce teleworking one day per week or more by 2005. In order to keep the pressure on to sign-up additional county teleworkers, the county sponsors telework events, recognizes county departments that increase the number of teleworkers, and uses communication tools such as the Employee Courier to feature articles about teleworking and teleworkers.

- Wind Energy purchase: Fairfax County has agreed to purchase 5 percent of its electricity from Mountaineer Wind Farm in West Virginia in April 2005. Staff worked with the Virginia Energy Purchasing Governmental Association to change the by-laws to allow this purchase. It is the first wind energy initiative in Virginia. It's a two-year contract and it's a joint purchase with Arlington County. Fairfax County's cost is $82,000 per year along with the shared $15,000 cost for negotiation expenses. The projected emission reductions are 6.3 million pounds of CO_2, 23,200 pounds of SO_2 and 11,600 pounds of NO_x. The board of supervisors recently approved funding to continue the wind energy purchase with a new two-year contract to be bid in 2007.

- Participation as a Clean Air Partner: Fairfax County government has been a member of Clean Air Partners, a regional public-private partnership chartered by the Metropolitan Washington Council of Governments and formerly known as ENDZONE since 1998. Its mission is to build awareness of how individuals contribute to air pollution and to promote easy and effective voluntary actions those individuals and employers can take to reduce air pollution and improve the health and quality of life in the region. In the spring of 2005, the Office of Public Affairs and the Health Department joined with Clean Air Partners in the "2005 Clean Air Action" media campaign. As a Clean Air Partners sponsor, during the summer months, Fairfax County will be included with other Clean Air Partners in a comprehensive public outreach campaign through radio and television spots, print ads, fliers, promotional materials and Web site links on its Web site. This effort is to build awareness and teach people how their actions contribute to air pollution. The goal is also to promote easy and effective voluntary actions people can take to reduce air pollution and improve their health and quality of life in the region.

- Air Quality outreach: The county has been proactive in its efforts to inform county employees and residents about air quality programs and ways to reduce air pollution. The Office of Public Affairs and the Health Department have been working together to create public education materials about the dangers of ground-level ozone and particle pollution, and actions that county employees and county residents can take to promote cleaner and healthier air in this region. Materials they've developed for adults and children are being distributed in government offices, libraries, recreation centers, community meetings and at many outreach events such as the county fair, *Celebrate Fairfax.* In addition articles on air quality have been distributed through internal county publications and external outreach, including NewsLink, Web sites, cable Channel 16 and homeowners associations. The county also has a notification program that involves the posting of Air Quality Action Day forecasts on Fairfax County Government Cable Television Channel 16 and the county Web site, as well as sending e-mail notifications to all county employees. These messages include appropriate actions to take to reduce contributions to ozone formation. Some actions currently practiced by Fairfax County government when a Code Red Day for ozone is forecast include: the refueling of vehicles after sunset; the restriction on the use of non-essential motorized operating equipment; encouraging employees to telework and teleconference to participate in meetings; and the offering of free trips on the Fairfax Connector buses.

- Use of low volatile organic compound paints: Besides reducing emissions of ozone-forming compounds, low-VOC paints improve indoor air quality by reducing eye or respiratory irritation caused by exposure to paint fumes.

- Episodic ban on the use of VOC-containing paints and pesticides: Deferring the use of VOC-containing paints and coatings on Code Red Days for ozone will reduce VOC emissions (an ozone precursor) and overall ground-level ozone formation. Both the active and inert ingredients of many pesticides are reactive in the formation of ozone. Under this policy, county and contractor applications of pesticides would be deferred on Code Red Days for ozone.

- Episodic ban on the use of gasoline powered lawn and garden equipment: County and contractor mowing and trimming operations will be deferred on Code Red Days for ozone, except on specialized turf areas at the golf courses and athletic field complexes. The county will continue a replacement policy to purchase low-emissions lawn and garden equipment that reduces ozone precursor emissions.

- Episodic ban on the refueling of non-essential gasoline powered cars and equipment: County employees have been notified that they are not to refuel their gasoline powered vehicles and equipment on Code Red Days for ozone until after dusk unless refueling is needed for emergency or vital functions. In order to monitor the effectiveness of this measure, a report of any refueling that occurs on a Code Red Day will be given to agency directors the next day enabling follow-up action without restricting vital functions that require refueling.

- Best Practices in Pesticide Application: The Fairfax County Park Authority has implemented an integrated pest management program at golf facilities and athletic field complexes. The Park Authority's approach to select pesticide applications is one of prevention rather than a curative one. This approach greatly reduces the amount of product (VOC emissions) required to keep turf healthy and allows the IPM program to be more effective.

- Alternative Fueled Vehicle Purchases: The county favors purchase of low-emission hybrid drive vehicles when appropriate for replacement of vehicles being retired. The current county fleet has 90 hybrid-electric vehicles (59 Toyota Prius, 30 Ford Escape sport utility vehicles and one plug-in hybrid).

- The county has been improving energy efficiency in its buildings and staff has completed numerous heating/ventilation/air conditioning and lighting upgrades with a projected energy savings of 6,630,675 kwh over a two-year period.

- The county is uses green building practices in most of its new buildings and renovation projects. In addition the county has numerous tree preservation and planting efforts (see the Ecological Resources chapter of this report).

EQAC is encouraged by this and feels that the county is moving in the right direction.

a. Clean Air Interstate Rule – Help Reduce SO_2 and NOx

On March 10, 2005 the U.S. Environmental Protection Agency issued the Clean Air Interstate Rule, which is expected to achieve the largest reduction in air pollution in more than a decade. CAIR will be effective starting July 11, 2005 and it requires 28 eastern states (including the states in the Metropolitan Washington region) to permanently cap emissions of sulfur dioxide and nitrogen oxides. This rule was put into place to address the fact that EPA has determined that upwind states are contributing significantly to nonattainment of 8-hour ozone and fine particulate/$PM_{2.5}$ standards in downwind states. Implementation of the rule should assist nonattainment areas in achieving the National Ambient Air Quality Standards. States covered by CAIR, including Virginia, must submit state implementation plans including control measures to reduce emissions of NOx and SO_2. EPA is requiring that emissions reductions be implemented in two phases. The first phase of NOx reductions start in 2009 (covering 2009 – 2014) and the first phase of SO_2 reductions start in 2010 (covering 2010 – 2014). The second phase of reductions for both NOx and SO_2 starts in 2015. The required emissions reductions requirements are based on controls that are known to be highly effective. When fully implemented, this rule is expected to reduce SO_2 emissions by over 70 percent and NOx emissions by over 60 percent from 2003 levels. So the hope should be, as we have stated in the past, that we would see something in the neighborhood of a 20 percent reduction in NOx for Fairfax County as a result. These reductions are an important part of the Washington region's SIP, a plan to reduce air pollution in our region. Actual reductions in the metropolitan area along with reductions of

transported NOx will be critical to attaining the federal standard during ozone season. This EPA action provides for the NOx SIP Call cap and trade program to be replaced by the CAIR ozone-season NOx trading program. The Virginia Department of Environmental Quality hopes to have this regulation approved by the State Air Pollution Control Board by the end of 2006. The rule includes a voluntary public health set-aside that affected plants can donate excess emission credits to. The proposed rule also has an efficient energy/renewable energy set-aside, which could allow the county to get emission credits for its wind energy purchase and energy efficiency programs in county buildings. These credits would then be retired, lowering the allowable emissions in the state. The state would also be able to use these control measures in the SIP, demonstrating further progress toward meeting the ozone standard.

This rule also includes revisions to the Acid Rain Program regulations streamlining the operation of the Acid Rain SO_2 cap and trade program. The effective date for the Acid Rain Program change is July 1, 2006. This EPA action provides for the NOx SIP Call cap and trade program to be replaced by the CAIR ozone-season NOx trading program.

A primary concern that we have with this rule is that it allows trading of emission credits and, as a result, emission reductions on a point source basis cannot necessarily be predicted. There are four major power plants in the Washington area and it is our understanding that in some, if not all, of these cases those power plants are emitting considerable quantities of NOx in this area as a result of decisions to purchase emission reduction allowances outside of the Washington Metropolitan air shed.[1] A particular concern for the Washington area is the Potomac River Generating Plant in Alexandria. Because the plant produced NOx emissions in 2003 well in excess of its state operating permit, the Virginia Department of Environmental Quality pursued enforcement actions against the plant. In a joint federal-state settlement in May 2006, Mirant Mid-Atlantic agreed to annually eliminate nearly 29,000 tons of harmful NOx pollution generated by its four electricity generating plants in Maryland and Virginia. The commonwealth of Virginia, in consultation with the Department of Energy, is addressing particulate matter impacts from the Potomac River Generating Plant through a separate proceeding.

Although it should not theoretically have any direct impact on the overall effect of the CAIR, the implications of New Source Review reform are also of concern to us since those reforms may result in additional generation of NOx at some coal burning facilities in the future.

[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).

b. Planning for the New Eight-Hour Ozone and Particulate Matter Standards

EPA published final non-attainment designations for the eight-hour ozone standard in April 2004. The Metropolitan Washington area, which includes Fairfax County, was designated a moderate non-attainment area. EPA revoked the one-hour ozone standard on June 15, 2005 and the 8-hour ozone standard is now in force. The Metropolitan Washington region must develop a new SIP and submit it to EPA by June 2007 showing how it will attain the eight-hour ozone standard by 2010. The Metropolitan Washington Air Quality Committee, the air quality planning group for the Washington region, along with its Technical Advisory Committee has been working on a plan for development of the eight-hour SIP and identification of additional emission control measures. 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 will provide overall guidance and streamline 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 will work in concert with the air quality and transportation committees of the Metropolitan Washington Council of Governments to achieve its goals. All of this serves to make the point that the advent of the eight-hour standard continues to leave little doubt that this new standard will inevitably make air quality management activities in the county considerably more difficult.

In December 2004, EPA designated the Metropolitan Washington region as a non-attainment area for fine particle pollution, also known as $PM_{2.5}$. The designation became effective on April 5, 2005. Nonattainment areas are required by early 2008 to submit a SIP to EPA defining the expected methods for reducing the fine particulate matter level in the air and emissions of $PM_{2.5}$ precursors. MWAQC and TAC will start planning efforts to meet this standard soon. They are still awaiting guidance documents at this time.

In 2005, the county once again had exceedances of the eight-hour ozone standard and there were more days with exceedant levels than in 2003 and 2004. However, amazingly, there were no exceedances of the one-hour ozone standard. As the county moves away from the one-hour standard and into the eight-hour standard, the direct implications of chronic nonattainment, especially of the eight-hour standard, will become a much more serious matter in the region. Fairfax County must continue to work with the MWAQC to develop control measures that can be implemented in the region to attain compliance with the ozone standard.

c. Severe Area SIP Planning

On May 13, 2005, the Environmental Protection Agency approved Virginia's one-hour "Severe Area SIP". In February 2004, MWAQC approved the new "Severe Area" SIP for submittal (by March 1, 2004) to EPA by Maryland, Virginia and the

District. Upon its redesignation as a "severe" non-attainment area in February 2003, the Washington region was required to prepare a new SIP to show compliance with the more stringent severe area requirements. An interim SIP submittal in August 2003 fulfilled some of these requirements. The rest of the requirements were fulfilled by the March 2004 submittal. The new SIP includes an updated attainment demonstration reflecting revised MOBILE6-based motor vehicle emissions budgets, the demonstration of 3 percent per year rate of progress from 1999-2002 as well as from 2002-2005, the adoption of contingency measures for failure to make ROP during those periods, and the submission of Reasonably Available Control Measures. There are other requirements as well.

In developing this SIP, the MWAQC identified a series of control measures that it feels will allow the region not only to demonstrate progress toward, but in fact to attain, the ozone National Ambient Air Quality Standards by November 15, 2005.[2] These include new regulations requiring redesigned fuel containers, low-VOC paints and consumer products and changes to certain business practices that result in high VOC emissions. Most of these regulations are in place and have been implemented in the region.

An additional portion of the region's emission control strategy is a "voluntary bundle" of emission reductions from innovative programs implemented by local governments. These programs include a gas can exchange, use of low-VOC paints, purchase of wind power, retrofitting of diesel school buses and purchases of alternative fueled vehicles. Fairfax County was a leader in committing to implement many of these critical programs.

d. Conformity Planning Requirements and Status

The purpose of the air quality conformity analysis is to assure that planning for transportation activities is consistent with air quality attainment / management targets. In non-attainment areas such as the metropolitan Washington area, the Constrained Long Range Plan for transportation and Transportation Improvement Program cannot be fully implemented if, collectively, the projects included in them result in emissions (of certain criteria pollutants) in excess of the limits established by the region's air quality plan, the state implementation 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.

[2] The details of this SIP, such as they are, can be reviewed on the COG Web site at www.mwcog.org/environment/air.

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 is currently developing a new plan to demonstrate attainment, which will establish new limits of VOC and NOx emissions from the transportation sector. The current schedule calls for the plan to be completed and submitted to the state air agencies, which must submit it to the U.S. Environmental Protection Agency by June 15, 2007. The region has continued to perform the conformity analysis on its CLRP and TIP. Per US EPA's conformity regulations, the emissions limits set in the one-hour ozone plan is being used to demonstrate conformity. Once new emissions limits are set by the eight-hour SIP, transportation plans and programs will have to conform to these new limits. It is expected that the new limits on VOC and NOx emissions limits will be lower than those set under the one-hour plan.

Additionally, in December 2004, EPA designated the Metropolitan Washington region as nonattainment of the standards for another criteria pollutant, Particulate Matter (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 is due to the US EPA by April 2008. The designation as a $PM_{2.5}$ non-attainment area had an immediate affect on transportation planning in the region in that it had a one-year grace period, starting April 5, 2005, in which to demonstrate the $PM_{2.5}$ emissions from transportation sector would not be increasing in future years. If such a conformity demonstration were not completed by April 6, 2006, the CLRP and TIP would have lapsed. This would have halted further federal funding and approval of transportation improvement projects. The Transportation Planning Board, the designated Metropolitan Planning Organization for the region, working with the Metropolitan Washington Air Quality Committee and all three air agencies in this region, and following the U.S. EPA guidelines for conformity analysis, completed its $PM_{2.5}$ conformity analysis in December 2005. This analysis was approved by the Federal Highway Administration and the Federal Transit Administration in February 2006.

The region has plans to develop a detailed plan to demonstrate attainment of the $PM_{2.5}$ standards. This plan will establish new limits on the amount of $PM_{2.5}$ emissions from transportation sector. Once this $PM_{2.5}$ plan is finalized, the region will have to limit $PM_{2.5}$ emissions from the projects in the CLRP and TIP to these new levels.

2. Air Quality Status in Northern Virginia

a. 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. The 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.

b. Ozone Exceedances in 2005

Attainment of the ozone standard in the Metropolitan Washington area will require each monitoring site in the region to have a three-year average of the fourth-highest daily maximum 8-hour average of data not to exceed 0.08 ppm.

Monitors in Fairfax County recorded violations of the eight-hour ozone standard on twelve days during the 2005 ozone season. Violations occurred at four different county monitoring sites. The Washington region registered nineteen days with violations of the eight-hour standard during the 2005 season.

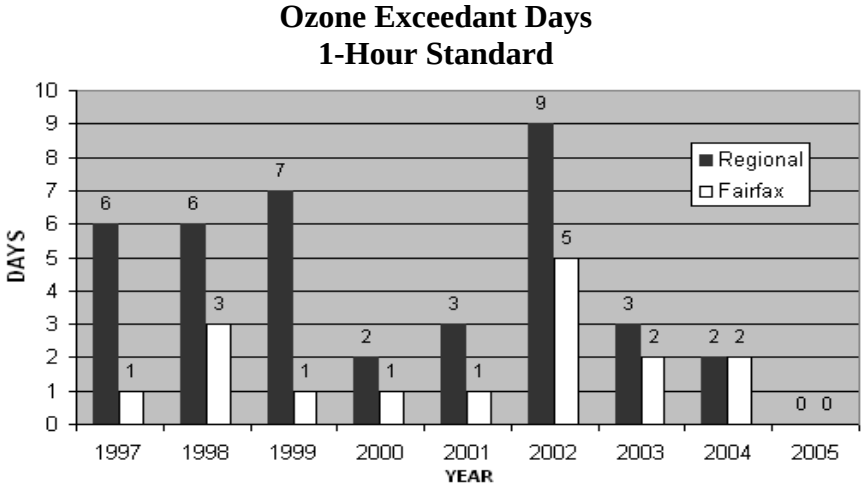
Obviously it is going to be very challenging for the region to meet the eight-hour standard. It will not be easy to implement additional control measures for this region, but they will be necessary to reach attainment of the standard. It is hopeful that CAIR will help reduce ozone transport into the region, but staff will have to continue to work with EPA and regional planning groups to ensure that transport is controlled in any way possible.

c. Air Quality Trends

The Metropolitan Washington Council of Governments analyzes monitored air quality data in the metropolitan region. In a recent news release (dated September 2006), COG states that the air quality in this region is improving. COG reports that ozone levels have decreased over the past decade, even on hot, dry summer days when ozone most often forms. In addition, air quality monitors throughout the region have measured lower concentrations of ozone and more monitors are now in compliance with the standard. COG stated that the metropolitan Washington region now has 44 percent fewer days of air pollution from ground level ozone since 2003 than it did in preceding years. The region has made great strides reducing the emissions that cause ozone. Emissions of nitrogen oxides, which are found in vehicle exhaust and power plant emissions, have decreased. Cleaner fuels are helping and increased controls placed on power plants since 2003 have helped immensely. In the same time period, emissions of volatile organic compounds from chemical solvents, paints and gas cans have also been reduced. The region's air quality continues to be significantly affected by ozone emissions transported into the region from other areas. The new Clean Air Interstate Rule should help reduce ozone transport.

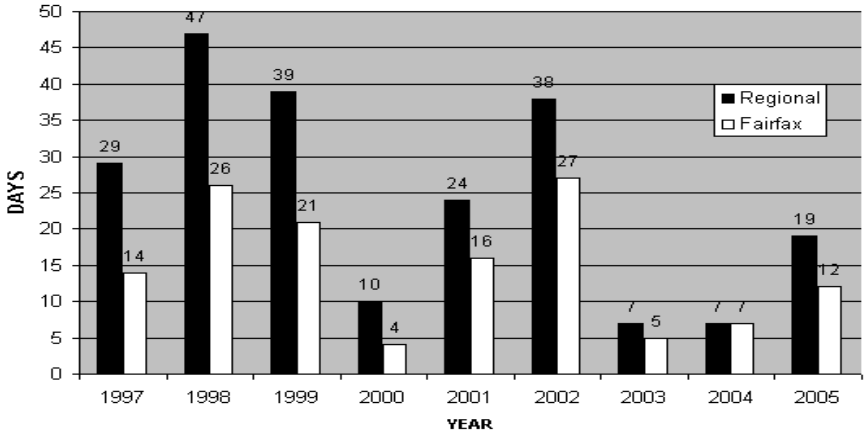
According to COG and the Fairfax County Health Department, there were no one-hour ozone exceedances in 2005 in either Fairfax County or the Metropolitan Washington Region (Figure II-1). However, the eight-hour ozone standard is making it more difficult for the region to meet the federal standard (Figure II-2, Figure II-3 and Table II-1). This indicates that the county cannot afford to reduce or diminish its air quality planning efforts.

Figure II-1: Air Quality Trends in Relation to a One-Hour Ozone Standard



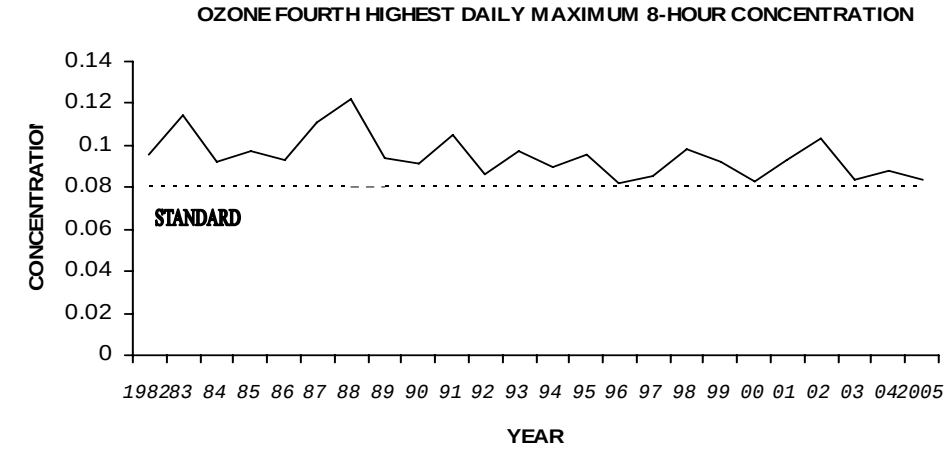
Source: Fairfax County Health Department

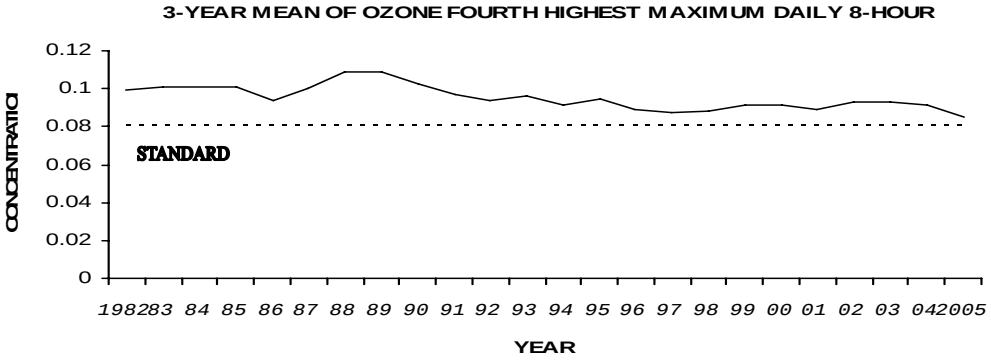
Figure II-2: Air Quality Trends in Relation to an Eight-Hour Ozone Standard



Source: Fairfax County Health Department

Figure II-3: Air Quality Trends in Relation to an Eight-Hour Ozone Standard (continued)





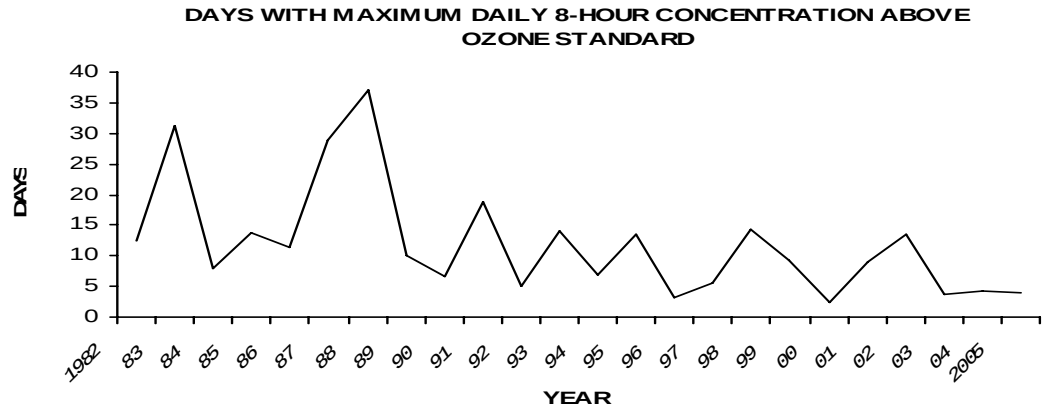
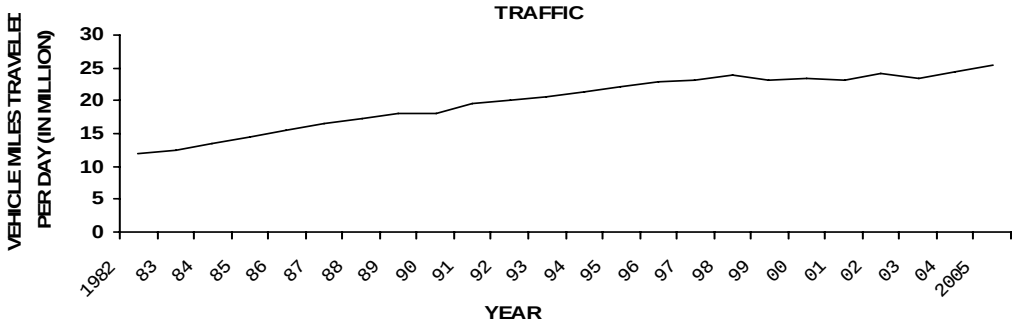


Figure II-3 (Continued)



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

Table II-1: Regional Eight Hour Ozone Exceedances, 2005

Date	Number of Stations that Exceeded the Standard	Max. Values in the Metropolitan Statistical Area; Max. 8-Hour Ozone (ppm)
June 25	1	0.087
June 26	1	0.086
June 30	1	0.091
July 1	1	0.086
July 12	2	0.100
July 20	1	0.088
July 21	1	0.093
July 22	1	0.094
July 26	5	0.097
August 2	1	0.089
August 3	3	0.097
August 4	8	0.097
August 5	10	0.094
August 6	2	0.088
August 11	5	0.094
August 12	3	0.088
August 13	2	0.088
September 9	1	0.088
September 12	1	0.086

Source: Metropolitan Washington Council of Governments.

B. MAJOR PUBLIC AGENCY RESPONSIBILITIES

1. Introduction

Although compliance with National Ambient Air Standards and resulting air quality management responsibilities is a function of federal law, in Fairfax County we have a situation where these responsibilities have been split between the commonwealth of Virginia and the regional metropolitan planning organization. MPOs are set up under the CAA 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 standards for air quality monitoring and vehicular inspection and maintenance programs.

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 Areas identified under Section 174 of the CAA. 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. In 2005, Dana Kaufman is chairman of MWAQC. The TPB 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. The chairman of the committee for 2005 is Tad Aburn, Maryland Department of the Environment. In 2006 Jim Sydnor, Virginia Department of Environmental Quality will serve as chairman.

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 will provide overall guidance and streamline 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 will work 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.

e. Air Quality Public Advisory Committee

This Committee has been set up 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.

f. 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 probably 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 Module

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 supposed to be 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 increasing responsibility to coordinate and manage the increasingly complex body of information relevant to air quality planning in Fairfax County, EQAC is pleased that an Air Quality Program Manager position has been filled to work on planning issues. 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

In response to our recommendation in 2002 that the county establish air quality planning capabilities in the Health Department, the decision was made to fill an Air Quality Program Manager position, which was filled in February 2005. This staff member is working with the Director of Environmental Health and the Environmental Coordinator to manage air quality efforts on behalf of the county. Those efforts are evolving and EQAC is involved, in a limited way, in reviewing and advising with respect to those activities. EQAC will continue to do everything it can to try to cooperate with the county in their efforts to identify short-term strategies that can result in compliance with the ozone NAAQS.

D. CONCLUSIONS AND OBSERVATIONS

1. In August of 2002, at the request of the deputy county executive, EQAC provided a summary of our concerns regarding air quality management needs in Fairfax County that included recommended staffing needs and related job description(s). We concluded our observations at that time by stating that "…planning capability will mean nothing unless the results of that capability can be adequately integrated into county activities." In November 2002, at about the time that we released our 2002 Annual Report recommending the hiring of a full-time air quality planner, the county embraced a two-track approach to air quality management that culminated in a series of announcements at the February 12, 2003 ECC/EQAC meeting dealing with air quality management. Since that time, EQAC interaction with the county has occurred principally through our interactions with the ECC and for the most part has been focused on long-term issues associated with the management of land-use/transportation issues associated with the Comprehensive Plan. This seems primarily to have been an outgrowth of our concerns about the possible relevance in Fairfax County of the concept of "Smart Growth". Meanwhile, in 2003 the county developed its own approach to air quality planning, and following discussions with MWAQC, developed an Air Quality Subcommittee designed to develop recommendations for the ECC and BOS on local and regional air quality issues. In April of 2004, the AQS presented its recommendations to the BOS Environmental Committee. EQAC is pleased with the work of the Subcommittee that included a variety of air quality management strategies as shown in the interim report and Clean Air Café menu that was presented to the board's Environmental Committee. Many of those strategies have already been

completed and EQAC recommends that the board adopt and implement all of the recommendations shown in the menu and report.

2. We seem to be at an interesting point with respect to air quality management in Fairfax County. It is laudable that the county is now focused on the issue of air quality management and is working with COG and others involved in regional planning. We are especially pleased that the county has come forward with SIP (VOC and NOx) emission reduction strategies for both short-term ozone action days and long-term ongoing initiatives. These efforts played a significant role in the Washington region's ability to develop and submit a severe area SIP that has been more acceptable to the EPA. The pattern of ongoing violations, however, discloses a problem that requires reductions that must have impacts on the actual attainment of the standard. We understand that regional planning is taking place to develop control strategies to address this problem and we suggest that the county stay involved in this process.

3. Based on the discussions that have occurred between EQAC, the ECC and the Planning Commission, we understand 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. We will continue to interact in that venue to try to constructively address the issues that have been discussed there. Meanwhile, we continue to welcome the opportunity to be as interactive as possible with the Air Quality Subcommittee and its activities.

E. COMMENTS

EQAC reiterates and updates its recommendations from the 2005 Annual Report on the Environment:

1. County staff should continue to participate in the regional planning efforts through the Metropolitan Washington Council of Governments in identifying both quantifiable and qualifiable emission reduction measures and strategies to reduce air pollutants so that the Clean Air Act standards can be attained. We continue to recommend close coordination and communication between EQAC and the county on strategies and activities necessary to comply with the ozone and fine particle standard.

2. EQAC is pleased with the work of the county's Air Quality Subcommittee that included a variety of air quality management strategies as shown in the interim report and Clean Air Café menu that was presented to the board of supervisors' Environmental Committee. EQAC recognizes that a significant number of projects that are shown in the report and menu have been funded and implemented. EQAC commends the board on its strong support for air quality and recommends that the board continue to fund air quality projects and initiatives that are shown in the county's Environmental Improvement Program.

3. EQAC is also pleased to see the air quality outreach effort that the county has started. By getting the word out to people we can obtain voluntary actions and efforts to help improve the region's air quality. EQAC recognizes that this outreach effort would not be possible if it were not for the board's strong support in funding air quality monitoring equipment replacement and outreach and education efforts in FY 2005 through FY 2007. EQAC commends the board for this effort and recommend that the board continue to fund the air quality outreach program. EQAC would also like to commend the board and county on obtaining a National Association of Counties award in 2005 for its commitment to air quality excellence. The Air Quality Subcommittee should continue promoting clean air education programs and initiatives and find ways to expand their audience.

F. RECOMMENDATIONS

No new recommendations are proposed this year.

LIST OF REFERENCES

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

Agency Responses to the Environmental Quality Advisory Council Recommendations Contained within the 2005 Annual Report on the Environment

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.

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

Virginia, Maryland and the District of Columbia Partner to Improve Air Quality, Office of the Governor News Release dated May 31, 2005.

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

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

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

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

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

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).

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/).

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

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.

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

CHAPTER III

WATER RESOURCES

III. 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 III-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, Virginia and 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, 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.

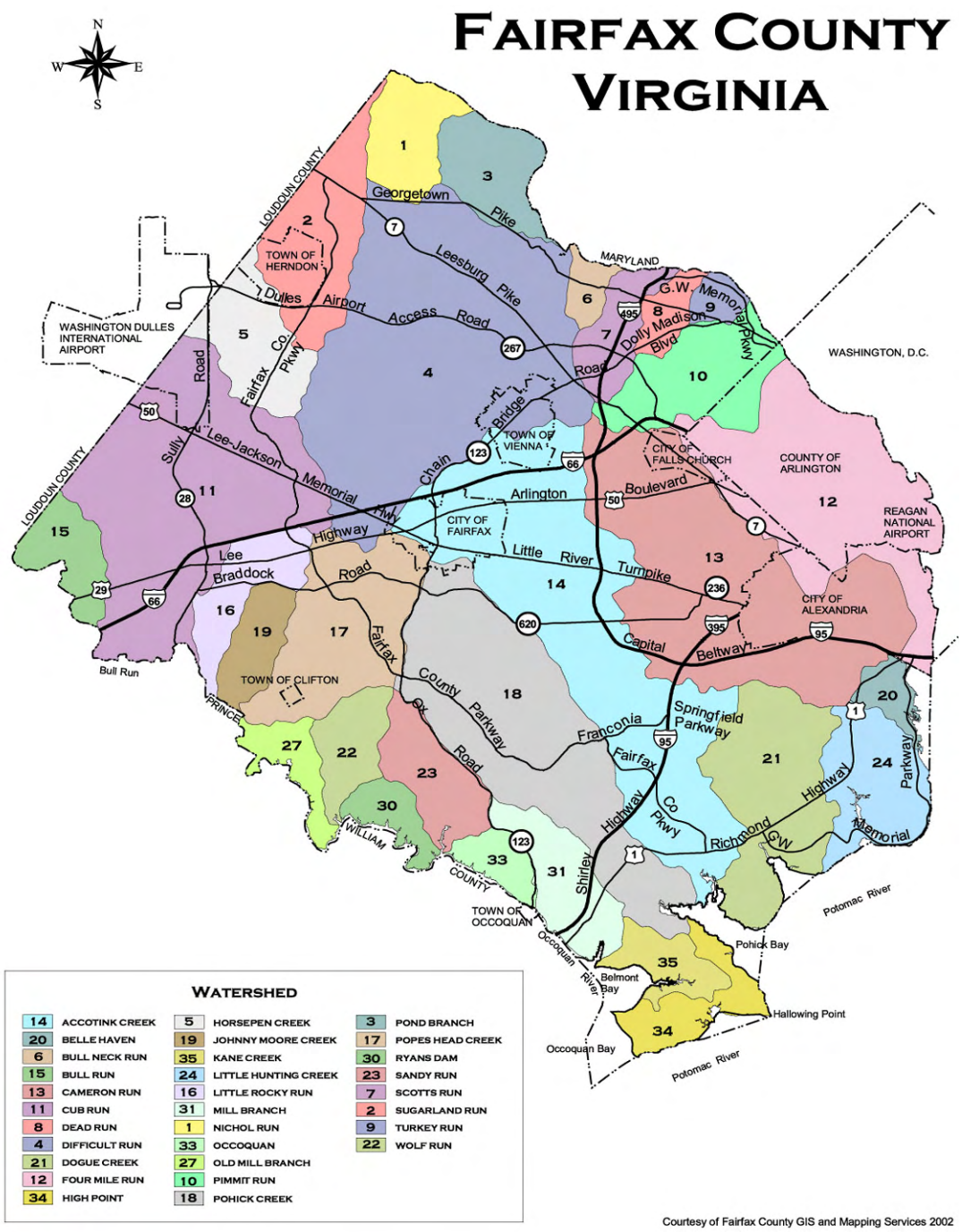


Figure III-1: Fairfax County Watershed Map

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, NPS pollution is difficult to control. NPS pollutant loads are greatest following rainfall and high flow events. A significant part of the NPS load consists of nutrients, including nitrogen and phosphorus (organic matter, fertilizer), which stimulates algal growth. Other NPS 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 NPS, 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 provide volunteer water quality monitoring data. 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. 2005 Annual Report on Fairfax County's Streams

This annual report provides results from a probability-based sampling program conducted in 2004. The report provides data from monitoring efforts and analyses of bacteria (*E. coli* and fecal coliform), benthic macroinvertebrates and fish. All bacteria monitoring sites where at least four samples were taken exceeded the state's water quality standard for fecal coliform bacteria (400 fc/100 ml) at least once. Samples were also taken to measure chemical parameters including pH, water temperature, nitrate nitrogen, phosphorus and dissolved oxygen. Sampling results indicated that three-quarters of the county's streams are in fair to poor condition. 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 2005 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

On July 7, 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.

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. In 2005, there were 50 active monitoring sites. The District added bacterial and temperature monitoring programs in 2005.

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 four permanent monitoring stations in Fairfax County, with a fifth to start in 2006.

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

3. Fairfax County Park Authority Stream Monitoring

Ellanor C. Lawrence Park staff conducts stream studies (primarily benthic macroinvertebrates monitoring) at Walney Creek, Big Rocky Run and Courthouse Spring Branch four times per year.

Water quality monitoring was conducted at six sites in Huntley Meadows Park in 2005 using the Rapid Bioassessment II protocol. Eighteen samples were collected. Seven sites on Dogue Creek and four sites on Barnyard Run were reported as "good." Of the

additional sites on Barnyard Run, seven sites were reported "fair," one site was reported "poor" and one site was not monitored due to very low water levels.

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. Additionally, DEQ has eight monitoring stations in the county. Monitoring began in July 2004 and will continue for two years. DEQ staff conduct 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. 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 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 sewage treatment plants entering 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 SOCs 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.

6. Kingstowne Monitoring

In 1998, DPWES, the Northern Virginia Soil and Water Conservation District, the U.S. Natural Resources Conservation Service and two residents' groups (the Friends of Huntley Meadows and the Citizens Alliance to Save Huntley) formed a partnership to restore a stream in the Kingstowne area of the county. The Kingstowne stream is a tributary of Dogue Creek and is upstream of Huntley Meadows Park. Monitoring and testing have substantiated that erosion has been brought under control and water quality downstream is improved. During July 2004-2005 monitoring period, storm event and base flow samples were collected and analyzed to determine pollutant loads in Dogue Creek. Based on the monitoring data, sediment removal efficiencies were achieved for all storm events. The phosphorus removal rate did not meet permit requirements of 50 percent removal so DPWES is working with the Army Corps of Engineers to resolve the problem.

7. 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.

8. Total Maximum Daily Loads

A Total Maximum Daily Load is a highly structured, watershed-specific plan for bringing an impaired waterbody into compliance with the Clean Water Act goals. The 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 waterbodies in Fairfax County are included in Virginia's listing of impaired waters. Ten of the waterbodies are multi-jurisdictional. Of the listed waterbodies, 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 declining populations of benthic macroinvertebrates. For the estuarine waterbodies, the cause of impairment is bacteria and/or PCBs in fish tissue. According to the schedule, seven waterbodies require TMDL studies to be completed by 2010, nine by 2014 and three by 2016.

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

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, 6 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: www.novaregion.org/bacteriaimplementation.htm.

9. 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 waterbodies 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 2005 Reston Lakes Annual Monitoring Report. This report and other information about Reston's lakes can be obtained by contacting RA's watershed manager at 703-435-6560 or visiting the Web site: www.reston.org.

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. In 1999, Lake Barcroft

dredged approximately 15,000 cubic yards of sediment from the lake. In order to avoid the costs associated with hauling it to a landfill, the WID rented a huge topsoil screening machine and excavator to load it, converting the waste material into topsoil by filtering out all the sticks, stones and trash. The topsoil was then made available to local residents. The WID is planning another large-scale dredging project in 2006; however, there are concerns with the lack of nearby disposal areas to reduce dredge disposal costs. 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. 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. The planned dredge amount was 161,000 cubic yards over a 12 month time period. DPWES issued a Notice to Proceed in September 2005. In July 2005, a contract was awarded to Mobile Dredging and Pumping Company. Mobilization began in October 2005 and the pipe line installation in January 2006. Dredging began in June 2006. The project also includes wetland creation and enhancing existing wetlands. DPWES is anticipating the project to be substantially complete in the spring of 2007.

10. 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.

Neither Fairfax County nor the Virginia Department of Environmental Quality monitor the quality of groundwater.

a. Leaking Underground Storage Tanks

In 2005, there were 132 reported incidents investigated by the Virginia Department of Environmental Quality, of which 36 remain open for ongoing scrutiny. As of June, 2005, there were a total number of 2,101 cases, of which 157 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.

Two watershed management plans (Little Hunting Creek and Popes Head Creek) have been completed and are being implemented. The plans includes several projects, including stream restoration, riparian buffer restoration, installation of low impact development practices, retrofitting and improving existing stormwater management facilities and infrastructure and recommendations on modifying the County Code and Public Facilities Manual.

Four additional management plans, Cameron Run, Difficult Run, Cub Run/Bull Run and Pimmit Run/Middle Potomac, are in the process of being completed. Additional watershed management plans that had been anticipated to be started in 2006 include Accotink Creek, Dogue Creek, Little Rocky Run/Johnny Moore Creek, Pohick Creek and Sugarland Run/ Horsepen Creek. The completion of all watershed plans is expected by 2009.

2. Restoration Efforts

a. Riparian Buffer Restoration

Fairfax County is conducting a 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 recently completed countywide stream physical assessment was conducted to develop a planting priority list and schedule. Approximately 2,000 trees and shrubs were planted at six sites throughout the county in fall 2005. It is anticipated that 40 additional sites will have been restored by the summer of 2006 through volunteer and contracted planting efforts.

b. Accotink Creek Watershed

In 2005, the Fairfax County Park Authority and Virginia Department of Forestry worked together to construct a crib wall to reduce bank erosion along a 30-foot section of stream below the Lake Accotink Dam.

c. Pohick Creek Watershed

In spring 2005, VDOT completed a stream restoration project using bioengineering techniques on a tributary of Pohick Creek near Lorton Road. The project was part of VDOT's U.S. Route 1 widening project. Field evaluations indicate the project was successful.

d. Difficult Run Watershed

The Fairfax County Park Authority hired a consulting firm to design a stream restoration project to stabilize several hundred feet along two sections of Difficult Run upstream of Georgetown Pike. The project involved a combination of structural and bioengineering techniques. Construction for the project was completed in November 2005.

e. Huntley Meadows Park - Barnyard Run

In spring 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 seeding.

f. Reston

In 2005, Reston Association continued to work with Northern Virginia Stream Restoration, L.C., to help coordinate and establish the Reston stream mitigation bank. 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.

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 2005, VDOF partnered with volunteers from various organizations, such as the Difficult Run Community Conservancy, Potomac Conservancy, Trout Unlimited, Eagle Scouts and the Chesapeake Bay Foundation to plant approximately 3,500 seedlings along 3,020 linear feet of streams throughout Fairfax County.

VDOF continues to work with NVSWCD and DPWES on various stream restoration and LID projects. In 2005, VDOF conducted 25 presentations on benefits of urban forests and three workshops on rain gardens and forest buffers. VDOF also reviews and comments on rezoning applications and development plans.

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

The National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit, a five year permit that is commonly referred to as the "MS4" permit, was reissued by the Virginia Department of Environmental Quality in January 2002. Total Maximum Daily Loads are included in the permit. 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. MS4 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 1,000 stormwater management facilities, 1,400 miles of pipe and 45,000 drainage structures designed to protect the county's streams. The county completed over 30 improvement and retrofit projects in 2005. The 2005 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 type of projects being undertaken to improve and protect water quality.

4. 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 2005, significant progress was made towards the fulfillment of the stormwater and erosion and sedimentation control recommendations. DPWES, the Northern Virginia Building Industry Association and the Engineers and Surveyors Institute worked

together to explore ways to improve the effectiveness of the county's E&S Control Program. Classes and workshops were conducted that covered topics including the county's E&S requirements, constructability issues, quality control of plans and inter-jurisdictional E&S regulations.

In 2005, 258 E&S plans were submitted and approved for projects that would disturb one acre or more of land. Land Development Services staff conducted 27,469 Erosion and Sediment control inspections, totaling over 3,100 inspections a month. Approximately 45 percent of these projects consisted of bonded site plans and subdivision plans. The remaining 55 percent consisted of individual residential grading plans and minor site plans.

In June 2006, the Virginia Soil and Water Conservation Board gave the county's Erosion and Sediment Control Program a rating of "fully consistent" in the four areas: Administration; Plan Review; Inspection; and Enforcement.

In 2005, DPWES developed amendments to the adequate drainage provisions of the PFM to address adequate outfall. The county board of supervisors adopted the amendments in 2006. The amendments clarify the extent of downstream analysis that must be provided and provide alternatives for proving no adverse impact and a proportional improvement of outfalls.

5. Illicit Discharges

In 2005, the Hazardous Materials and Investigative Services Section of the Fairfax County Fire and Rescue Department responded to 586 calls, including 440 reported releases of petroleum products. Sixty-nine cases directly impacted storm drains or surface waters.

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 VA Department of Environmental Quality. The permit limits and 2005 plant performance are listed in Table III-1.

Table III-1. UOSA Permit Requirements and 2005 Performance

Parameter	Limit	Performance
Flow	54 mgd	28.9 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	0.007 mg/l
Total Kjeldahl Nitrogen	1.0 mg/l	0.2 mg/l
Dissolved Oxygen	>5.0 mg/l	8.1
Disinfection Minimum Chlorine Residual	>0.6 mg/l	0.9 mg/l
Dechlorination Chlorine Residual (mg/l)	Non detect	Non detect

Source: Upper Occoquan Sewage Authority

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. Exceptional Quality biosolids have commercial potential in the horticultural and agricultural markets. 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 III-2 presents the facility's performance and current effluent monthly limitations.

Table III-2
NMCPCP Permit Requirements and 2005 Performance Averages

Parameter	Limit	Performance
Flow	67 mgd	42.1 mgd
$CBOD_5$	5 mg/l	< 2 mg/l
Suspended Solids	6 mg/l	1.1 mg/l
Total Phosphorus	0.18 mg/l	0.06 mg/l
Chlorine Residual	0.008 mg/l	< 0.008 mg/l
Dissolved Oxygen	6.0 mg/l (minimum)	9.1 mg/l
pH	6.0-9.0 (range)	7.1
E. coli Bacteria	126/100mls*	< 1/100mls*
Ammonia Nitrogen	1.0 – 2.2 mg/l (seasonal)	< 0.15 mg/l
Total Nitrogen	No Limit	< 3.9 mg/l

*Geometric mean Source: Department of Public Works and Environmental Services

The last major construction was completed in July, 2005. This project included process upgrades to remove ammonia to less than one mg/l and total nitrogen to less than eight mg/l in order to meet Virginia Water Quality Standards and the Chesapeake Bay Program goals for total nitrogen. Also included in the project are: flow equalization tanks, a new/upgraded laboratory for water quality testing, upgraded odor control systems, new instrumentation and control systems and a new septage receiving facility.

In 2005, 57,223 wet tons of sludge were generated and incinerated.

In 2005, the Virginia State Water Control Board formally adopted 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 NMCPCP and require substantial modifications by 2010.

2. Septic System Permitting and Repairs

Approximately 30,000 homes and business are served by septic tank systems in Fairfax County. The county's Health Department has reported that, in fiscal year 2005, 193 new septic systems were constructed and 602 Septic Tank Repair Permits were issued (repairs ranged from total replacement of the system to minor repairs such as broken piping). Areas of marginal or highly variable soil remain a concern for future failing septic systems.

3. Sanitary Sewer Maintenance and Repair

The Wastewater Collection Division within the Department of Public Works and Environmental Services manages the county's infiltration abatement program. Closed circuit television inspection is used to inspect trunk sewer mains to identify defective lines in need of repair. In 2005, 229 miles of old sewer lines and 30 miles of new sewer lines were inspected. Approximately 115,557 feet of sanitary sewer lines were rehabilitated. Over the past eight years, 219 miles of sewer lines have been repaired and 36 dig-up and 101 trenchless point repairs were completed.

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 54.117 billion gallons of drinking water in 2005.

Table III-3
Fairfax Water -Water Supply Sources, 2005

Sources	Gallons (in billions)
Occoquan Reservoir (Lorton/Occoquan)	20.41
Potomac (Corbalis)	33.47
Wells	0.003
Purchased	0.082
Untreated	0.152
TOTAL	54.117

Source: Fairfax Water

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 2005 Water Quality Report is available for review on the FW Web site at www.fairfaxwater.org.

1. Wells

a. Fairfax Water and Public Wells

In 2005, Fairfax Water operated two wells in Fairfax County, both located in the Riverside Manor Community until June 8, 2005, when these wells were permanently removed from service.

b. Private Wells

There are approximately 12,000 single family residences and businesses that are served by individual well water supplies in Fairfax County. In 2005, 135 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. New Occoquan Water Treatment Plant (Griffith WTP)

In May 2006, the new Fairfax Water Griffith Water Treatment Plant, a 160 million gallons per day facility, became operational. The plant replaces the Lorton and Occoquan treatment plants. 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)

The Corbalis plant, located near Herndon, is currently treating up to 150 mgd taken from an offshore intake on the bottom of 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 thought to be carcinogenic. The 2005 averages were below the Maximum Contaminant Levels for trihalomethanes. In addition to the disinfection byproduct, haloacetic acid levels were below the required MCL. The presence of chlorine in drinking water supplies remained below the required Maximum Residual Level. Fairfax Water tests water for the following 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 2005 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 2005 Fairfax Water monitored 3,299 taps for coliform bacteria. The monthly monitoring results were within EPA required limits. FW also monitored surface source water and finished drinking water for 42 volatile organic compounds and 39 synthetic organic compounds. No VOCs were detected in source waters except for trace amounts of MTBE, an unregulated gasoline additive. In finished waters, TTHMs and trace amounts of MTBE were detected. Specific information on these programs 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.

In June, 2005, the State Water Control Board adopted the Water Supply Planning Regulation (9 VAC 25-780). This regulation 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. DEQ is revising the Virginia Water Protection Permit regulation to incorporate various elements of the water planning process as they relate to permitting of withdrawals.

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 2005. No releases from upstream reservoirs to augment water supplies were needed. 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 on-line at: www.potomacriver.org/water_supply/status.htm.

The 2005 study is available on-line at:
www.potomacriver.org/water_supply/coop-pubs.htm.

b. Metropolitan Washington Area Council of Governments Water Supply and Drought Awareness Plan

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 two years that will address subjects such as endocrine disruptors in the Chesapeake Bay watershed and contaminants of emerging concern in the Potomac and Anacostia Rivers.

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. On March 21, 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 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. The target date for the transfer of the permitting program to jurisdictions had been set for July 1, 2006; however, this is subject to approval by the U.S. EPA.

3. Virginia Stormwater Management Program (Chapter 60)

Changes to the Virginia Stormwater Management Program (Chapter 60) became effective, July 2006. The legislation requires that "*stormwater management programs maintain post-development runoff rate of flow and characteristics that replicate, as nearly as practicable, the existing predevelopment runoff characteristics and site hydrology, or improve upon the contributing share of the existing predevelopment runoff characteristics and site hydrology if stream channel erosion or localized flooding is an existing predevelopment condition. Any land-disturbing activity that provides for stormwater management shall satisfy the conditions of this subsection if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or manmade channels*."

The legislation is available on-line at: www.dcr.state.va.us/lawregs.htm.

I. ACCOMPLISHMENTS

Over the past several years, Fairfax County has demonstrated a clear commitment to improve, restore and protect the county's water resources. 2005 was another significant year for watershed protection in Fairfax County.

- 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 2005, in response to the board of supervisors' directive for follow up action on the plan, the Environmental Coordinating

Committee prepared the FY 2007 Environmental Improvement Plan. The EIP addresses environmental and policy needs and assists county officials on making decisions regarding environmental funding and project planning. The EIP prepared in 2005 supported environmental initiatives and objectives identified in the Environmental Agenda for consideration in the FY 2007 budget. 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.

- In 2005, the county required 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 will help decrease adverse impacts to outfalls and receiving streams during construction. A committee comprised of professionals from the public and private sector developed recommendations for amendments to the Public Facilities Manual's provision for adequate drainage. Adopted in February 2006, the amendments provide greater protection to receiving streams and areas downstream from areas being developed.

- Efforts commenced in 2005 to incorporate Low Impact Development techniques into the PFM. Six practices (bioretention basins and filters, water quality swales, tree box filters, vegetated roofs, permeable pavers and reforestation) were selected to be developed and identified in the PFM as approved practices in Fairfax County. The proposed amendments to the PFM are anticipated to be brought to the board of supervisors for authorization in 2006. The county also committed to working the Engineering Surveyors Institute, Northern Virginia Regional Commission and other local jurisdictions to develop a design and construction standards manual for LID applications. The manual will be recommended for adoption into the county's PFM.

- The board of supervisors approved the results of the Quality Assurance / Quality Control study and adopted the updated Chesapeake Bay Preservation Area Maps with an additional 5.5 miles of perennial streams. There are a total of 860 miles of perennial streams in Fairfax County and Resources Protection Areas make up 18.4 percent of land area in the county. The study also helped to develop an updated stream data layer for the county's valuable GIS system and assisted in the inventory of headwater streams.

- The county continued the process of developing and completing watershed management plans for each of the county's 30 watersheds; the Little Hunting Creek Watershed Plan was the first watershed plan to be completed and was approved in February 2005. The Popes Head Creek Watershed Management Plan was also completed in 2005. Watershed management planning efforts continued in 2005 for Cub Run/Bull Run, Difficult Run, Pimmit Run and Middle Potomac (Bull Beck Run, Scott's Run, Dead Run and Turkey Run) watersheds. It is anticipated that this countywide watershed planning effort will be completed in 2009. 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.

- The Stormwater Planning Division of the Department of Public Works and Environmental Services continued the stream monitoring program it assumed from the Health Department in 2004. The division released the 2005 Annual Report on Fairfax County's Streams in November 2005.

J. 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 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 has 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.

At times, high levels of fecal coliform bacteria, particularly *E. coli* bacteria, occur in various streams throughout the county. A public outreach and information campaign to increase awareness about potential health hazards from coming in contact with impaired surface waters needs to be developed.

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.

K. COMMENTS AND ONGOING CONCERNS

1. EQAC commends the board of supervisors for its actions the past two years authorizing one penny of the real estate tax to be dedicated to the stormwater management program. The amount increased from $17.9 million for FY 2006 to $21 million for fiscal year 2007. This additional funding 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. 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 PFM'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 as a result of the perennial stream mapping program. EQAC further encourages the board of supervisors to support future protective measures for intermittent and headwater streams such as 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. EQAC further recommends a monitoring program to evaluate the effectiveness of stormwater detention facilities. While EQAC understands that a comprehensive countywide program to monitor effectiveness would be cost-prohibitive, data are still needed, as it is still unclear as to which structures and requirements are effective and working well. At a minimum, monitoring a representative sampling of different types of stormwater facilities throughout the county is recommended.

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 for adopting Residential Development Criteria that include supporting the provision of adequate outfall drainage and innovative water quality measures.

L. RECOMMENDATIONS

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. In addition to this overarching recommendation, EQAC is pleased to make the following recommendations:

1. EQAC continues to recommend either posting health warnings at county streams with high bacterial levels OR the creation of an improved public outreach information campaign that is effective in reaching more residents, including different social and economic groups across the county. This campaign should include, among other things, signs/postings at regional libraries, county parks and nature and recreation centers as well as seasonal articles in Fairfax County Weekly Agenda and other countywide distributed newsletters such as NVSWCD's "Conservation Currents." The campaign should not be limited to these examples. Any initiative should contain the following language from the 1999 Health Department report: "*The use of streams for contact recreational purposes, such as swimming, wading, etc. which could cause the*

ingestion of stream water or possible contamination of an open wound by stream water, should be avoided."

2. As sedimentation of stormwater management ponds from upstream development activity continues to increase, 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 recommends that the county conduct a study to analyze and 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.

3. Given that approximately 12,000 single-family residences and businesses are served by individual well water supplies in Fairfax County, and that approximately 30,000 homes and businesses have septic systems that ultimately infiltrate into groundwater, EQAC recommends the inclusion of a groundwater monitoring and management program in the county. Groundwater comprises the base flow for streams and reservoirs and therefore it is important to understand the quality of this input into the county's surface waters and drinking water supplies.

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CHAPTER IV

SOLID WASTE

IV. SOLID WASTE

A. ISSUES AND OVERVIEW

Fairfax County's Solid Waste Management Program had another safe and productive year in FY 2006. As it has for the past 15 years, 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 same period, the program also provided waste collection and recycling services to over 43,000 homes in designated County Sanitary Districts and moved a daily average of 144 tractor-trailer loads of municipal solid waste from the I-66 Transfer Station to the E/RRF or other appropriate disposal locations. In addition to these disposal activities, recycling in the county averaged 30 percent for all solid waste generated, exceeding the state requirement of 25 percent by weight.

Approximately 35 private solid waste companies also collect refuse and recycling materials from households in Fairfax County. These private contractors are closely monitored by Fairfax County personnel to ensure compliance with government regulations. These private companies use the same landfill and E/RRF facilities as county collections vehicles, but are charged usage fees.

1. Contractual Issues and Landfill Capacity

The E/RRF continued to serve as the primary disposal location for County municipal solid waste, processing over 1,050,000 tons of waste in FY 2006. Due to routine maintenance outages at the facility, the county bypassed approximately 45,000 tons of waste to landfills during the year, using contingency contracts that were in place. This is a 60 percent decrease from the amount of waste that was bypassed to landfills in FY 2005.

As in recent years, the E/RRF received a declining amount of waste from jurisdictions outside the county. Approximately 9 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. This was the first year that all of the Guaranteed Annual Tonnage (a minimum of 930,750 tons) was generated by Fairfax County sources. This increase, anticipated in the county Solid Waste Management Plan, is a primary reason why the county's recycling program should be expanded: by reducing the amount of municipal solid waste that needs to be disposed, the county can extend the capacity of the E/RRF to process materials that cannot be recycled.

2. Solid Waste Management Plan Implementation

While implementation of the SWM Plan began in FY 2005, it was not until FY 2006 that much of the Plan's strategies began to bear fruit. Highlights of the implementation actions include:

a. Substantially Revised Solid Waste Management Ordinance

The SWMP completed a comprehensive revision to the county's solid waste management regulations (formerly, Chapter 109) during FY 2006, now found in Chapter 109.1 of the County Code. The new ordinance was promulgated by the board of supervisors after a public hearing on July 10, 2006; it expands the county's recycling requirements, as described later in this section.

b. Increased Public Outreach

The SWMP created a one-page full-color chart that pictorially depicts the items that must now be recycled by county residents under the new Chapter 109.1. This was mailed to all residential customers who get curbside refuse and recycling collection from the county's Division of Solid Waste Collection and Recycling (about 44,000 households). The SWMP also offered the document to all private-sector refuse collection companies operating in the county, so that they could provide it to their residential customers. Finally, the chart was also published in a variety of local newspapers for the first six months of 2006 and is available in electronic format on the county's Web site at: www.fairfaxcounty.gov/dpwes/recycling/recycle-right.pdf.

c. Resources for Recycling Construction/Demolition Debris

The SWMP worked with the Metropolitan Washington Council of Governments to create the "Builder's Guide to Reuse and Recycling." This handbook, which is available free of charge, provides the locations where builders can recycle construction materials in Virginia, the District of Columbia and Maryland. Also, Chapter 109.1 requires that, beginning July 1, 2007, construction and demolition contractors must recycle corrugated cardboard.

d. Remote Household Hazardous Waste Collection Events

In addition to its permanent collection sites at the I-66 and I-95 Complexes, the SWMP conducted three remote HHW Events during FY 2006. The collection events were held at three locations, in the Mount Vernon, Mason and Dranesville Districts. Two additional events were held in the Hunter Mill and Braddock Districts in the months of September and October 2006. These events are also 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 certification with the Virginia Environmental Excellence Program, administered by the commonwealth's Department of Environmental Quality. It also maintains its

membership in the "Businesses for the Bay" program, a regional initiative supported in Virginia by VDEQ.

3. Solid Waste Disposal Fee

The contract waste disposal fee, offered to companies that sign agreements with the county, was $44.95 per ton in FY 2006 and increased to $46.95 in FY 2007. The increase helped to offset rising operational costs due to escalating fuel prices and contractual payments to Covanta Fairfax Inc. The contract disposal fee covers transportation and disposal of waste but does not fully cover the cost of all community benefit programs (e.g. recycling education, household hazardous waste, enforcement and community cleanups) provided by the SWMP. In FY 2006 and FY 2007, the General Fund transfer for these community benefit programs was $2.5 million. Prices for all materials are posted on the county's Web site and at the facilities.

B. PROGRAMS, PROJECTS AND ANALYSIS

1. Waste Disposal Program

a. I-95 Sanitary Landfill and Citizens Disposal Facility

i. Groundwater Monitoring

Groundwater Protection Standards were established for the I-95 Landfill 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. The 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 for approval. 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. Proposed components of the program consist of:

- Institutional controls.
- Engineering controls.
- Monitored natural attenuation.
- Accelerated bioremediation (reductive dehalogenation).
- 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.

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 the 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.

ii. Landfill Closure

Closure construction work continued during FY 2006 for the areas where municipal solid waste was previously disposed. Final closure consists of capping the landfill with a thick, low permeability soil layer to minimize surface water infiltration. Additional landfill gas control systems are being installed as part of the closure design. Placement of the closure cap is expected to be completed by September 2007. To date, the final cap has been placed over 105 of 135 acres to be closed.

Partial closure of Phase I of the ash landfill was completed during FY 2006. This eight-acre area was capped by using a synthetic landfill cap.

iii. Landfill Gas System and Air Emissions

The I-95 Landfill operates one of the largest landfill gas collection systems in Virginia, with over 300 installed wells extracting landfill gas for energy recovery. Approximately 3,000 cubic feet per minute of this landfill gas is distributed to a variety of energy recovery systems, including the six-megawatt Michigan Cogeneration Systems electric generating facility, and the three-mile landfill gas pipeline that provides fuel as a substitute for natural gas at the Noman M. Cole Pollution Control Plant. The landfill gas pipeline project continues to provide significant energy cost savings at the NMCPCP.

During FY 2006, ten new landfill gas wells were drilled to replace existing wells that ceased to function properly due to normal landfill settlement.

During FY 2005, county staff, with assistance from an outside contractor, converted space heating at the landfill shop facility to landfill gas (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 was given a National Award by the USEPA's Landfill Methane Outreach Program.

During the reporting period, the county continued its solid compliance history with Virginia's air pollution and landfill gas control regulations. Quarterly methane gas surface emission and perimeter monitoring were conducted as required, and annual air emission reports were submitted to the Virginia Department of Environmental Quality. 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 municipal solid waste. 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.

Construction of Phase IIB of the ash landfill (the third cell) was completed in November 2004. Disposal of ash in this cell began during May 2005. Approximately 1,000 tons of ash is placed daily in the new cell, which has capacity for ash disposal for three years and four months. 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 is scheduled to begin in March 2007 and should be completed by December 2007.

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 2006, 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 solid waste 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, and a small charge is made for some HHW materials. In FY 2006, users visited the I-95 CDF over 72,000 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 2005. This report states, "…the E/RRF appears to have performed sufficiently well from an operational standpoint for CFI to meet its performance obligations under the Service Agreement," and "CFI has remained in full compliance with all of its environmental permits and all regulatory requirements during FY 2005."

The E/RRF continued to produce up to 80 megawatts of electricity that was sold to Dominion Virginia Power. This is enough energy to power approximately 75,000 homes at any given time.

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 municipal solid waste per year. In FY 2006, the E/RRF processed over 1,050,000 tons of waste (approximately 87,500 tons per month). Approximately 960,000 tons of this waste originated in Fairfax County, with the remainder coming primarily from Prince William County.

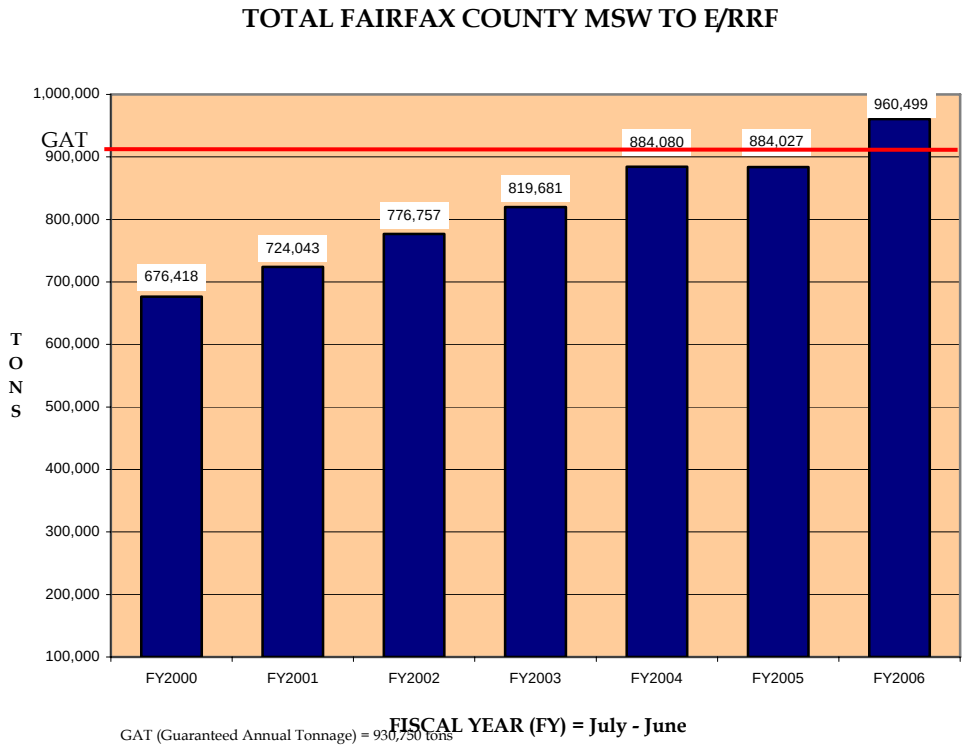


Figure IV-1. Total Fairfax County Municipal Solid Waste to E/RRF FY 2000-2006

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 the 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. Table IV-1 provides a summary of the stack emissions that were documented by an independent lab test in June 2006, reported to VDEQ.

iv. Material Recovery

In addition to recovering energy from municipal solid waste to generate electricity, metals are recovered from the ash residue and recycled. In FY 2006, 16,583 tons of ferrous metal and 43.72 tons of non-ferrous metal were recovered from the ash and sold for recycling. The non-ferrous metal process was not operating during most of the year.

Table IV – 1 Energy/Resource Recovery Facility Emissions Results June 2006		
Parameter	**Permit Limit**	**Average E/RRF Result**
Sulfur Dioxide	29 ppm	9.5 ppm
Carbon Monoxide	100 ppm	5.25 ppm
Nitrogen Oxides	205 ppm	192.25 ppm
Hydrochloric Acid	29 ppm	8.4875 ppm
Particulate Matter	27 mg/dscm	6.68 mg/dscm
Mercury	0.080 mg/dscm	0.0046175 mg/dscm
Dioxin/Furans	30 ng/Nm3	0.0123 ng/Nm3

ppm = parts per million mg = milligram ng = nanogram
Dscm = dry standard cubic meter [1]

It should be noted that in FY 2006, Covanta reinstituted recovery of non-ferrous metals after an extended period where these materials were not being targeted due to a combination of operational difficulties and poor market conditions.

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 municipal solid waste 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 144 loads were hauled from the facility each day in FY 2006. 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 2006, approximately 45,000 tons of waste was hauled from the Transfer Station to alternative disposal sites.

The VDEQ regulates the Transfer Station, and it is inspected by this agency on a quarterly basis: during all inspections of the facility during FY 2006, the VDEQ found the facility to be in full compliance.

[1] Covanta Fairfax, Inc, Annual compliance Stack & RATA Test Reports, (COV Report No. 3138), 12-15.

i. Citizens 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 2006, users visited the I-66 CDF more than 267,000 times. The CDF is being redesigned to accommodate growing demands for disposal and recycling services at that location. New scales and booths, improved entrance and egress and more technology are being planned, to improve customer service and reduce wait times. These changes are not likely to be in place until FY 2008.

ii. 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 can pack on and deliver more waste per trip. As the daily tonnage being managed by the transfer operations has grown, and in the face of a prohibition on new staff positions, the county has come to rely upon trucking contractors to supplement the county's fleet of tractor trailers.

Much of 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. This 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. Waste collection vehicles will be washed here, as well as other large county vehicles such as busses when the facility has sufficient capacity.

d. Household Hazardous Waste Program

Information regarding the Household Hazardous Waste Program and the Conditionally Exempt Small Quantity Generator service is 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. Approximately 35 firms hold county Certificates to Operate. 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. As mentioned earlier, Chapter 109.1 came into effect in July 2006; it is an extensive rewrite of the original solid waste ordinance, Chapter 109.

The SWMP therefore 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 from 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

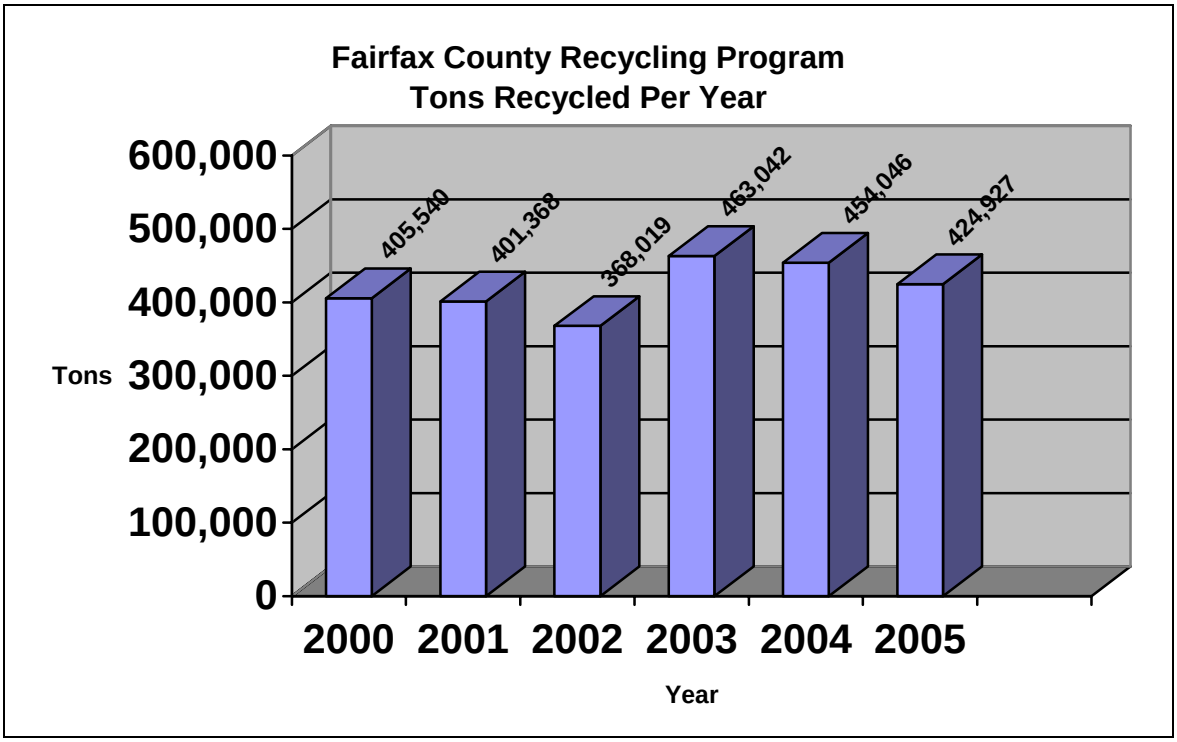
The SWMP's Division of Solid Waste Collection and Recycling assumes the lead role regarding the management and implementation of the countywide recycling program. The VDEQ is responsible for establishing the regulations that require all municipalities in the commonwealth to recycle a certain percentage of the total volume (by weight) of municipal solid waste 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 across the commonwealth have their required threshold set at 15 percent. Fairfax County is well ahead of this requirement. For calendar year 2005, Fairfax County's recycling rate was 30 percent. Reports documenting the recycling rate for the preceding calendar year are required to be sent to the VDEQ each year in the spring.

During the 2006 Virginia General Assembly session, House Bill 647 was enacted. This legislation will provide jurisdictions with an opportunity to receive a two percentage point credit for source reduction programs implemented within the jurisdiction, a ton-for-ton credit for solid waste material that is reused and a ton-for-ton credit for any non-municipal solid waste material that is recycled. The county expects to take advantage of the credit for source reduction programs as early as this year.

Chapter 109.1 requires annual reports on the tonnages of recyclables collected by solid waste collection companies, non-residential 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. The following chart (Figure IV-1) 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 approximately 5.5 million tons and continues to exceed the state-mandated requirement.

Figure IV-2.



b. Changes for 2006

As discussed earlier, the county promulgated a substantially-revised solid waste management ordinance, Chapter 109.1. The revised code will require recycling as described below.

- All non-residential entities in the county are required to recycle mixed paper and flattened cardboard. All non-residential entities that recycle a Principal Recyclable Material other than mixed paper and cardboard will be required to continue to recycle that PRM in addition to the mixed paper and cardboard.

- All multi-family residential buildings in existence prior to July 2007 are required to have recycling of mixed paper and flattened cardboard.

- All multi-family residential buildings constructed after July 2007 are required to have recycling of mixed paper, flattened cardboard, metal food and beverage containers, glass food and beverage containers and plastic bottles and jugs.

- All schools and institutions are required to recycle mixed paper and cardboard by July 2007.

- All refuse and recycling collection companies providing curbside service to residential customers are required to collect mixed paper, flattened cardboard, metal food and beverage containers, glass food and beverage containers and plastic bottles and jugs.

- All construction and demolition contractors are required to recycle cardboard by July 2007.

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 20,000 residences.

- The management of eight Recycling Drop Off Centers.

- Refuse removal due to evictions and other court orders.

- Public outreach and education on recycling and waste management.

Two new service programs were instituted in 2006: the "Megabulk" program and the "Clean Streets Initiative" program.

The Megabulk program was originally established for county refuse and recycling customers in Sanitary Districts, providing collection service for 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 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, CSI 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 residential units in Fairfax County. Curbside collection of yard waste is required to be provided by all refuse collection companies operating in the county, from March through December of each year. The revisions to Chapter 109.1 clarified that yard waste collection would begin in March each year and that no special separation would be required during January and February, other than Christmas tree collection.

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 2006, just under 150,000 tons of yard waste was recycled in Fairfax County.

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 ten years.

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 2005, county agency locations recycled approximately 730 tons of material. The SWMP provides the necessary support to ensure adequate communication of the recycling requirements, as well as operational support for general programs or special events as needed.

iv. 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, the support and advertisement of several days throughout the calendar year that are specifically dedicated to recycling, public speaking opportunities and technical support in the research of recycling technologies and issues.

In FY 2006, the SWMP worked 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 manage these materials legally and appropriately.

The SWMP has also continued a rechargeable battery recycling program, in collaboration with the Rechargeable Battery Recycling 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 all offices of 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: www.fairfaxcounty.gov/dpwes/recycling/mat-bat.htm. Also, as mentioned earlier, partnered with MWCOG to produce the Builder's Guide to Refuse and Recycling.

Annually, the Solid Waste Program participates in Celebrate Fairfax and Fall for Fairfax. 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 sponsor of the annual Earth Day/Arbor Day celebrations promoted by the Clean Fairfax Council. This year, the SWMP supported the Johnie 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 SCRAP, 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 Johnie 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 2005 was celebrated on November 5th with the Community Recycling Road show at Herndon High School. County staff again partnered with volunteers to show how recycling activities can support the local community. Students Against Global Abuse, the student environmental club at Herndon High School, helped staff collect computers, cell phones, bicycles and eyeglasses. ServiceSource, a sheltered workshop for adults with disabilities, collected used computers and other electronic equipment at this event.

Another aspect of the SWMP's public outreach and education effort is its active involvement in community events, public speaking opportunities and support to various community special interest groups such as the Lorton Citizens Alliance Team, the Business Advisory Committee and the Citizens' Advisory Committee on Solid Waste.

The SWMP also utilizes 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 routinely updates the site to account for changes in programs and activities. Hard-copy publications are regularly reviewed for clarity of content and are revised as necessary to ensure that they remain informative and address topical questions or issues. All publications will eventually be available on the county Web site, to allow easier access and distribution. Additionally, the county maintains an automated recycling information line (703-324-5052) for resident access to recycling opportunity information.

The SWMP also published an electronic e-mail to county collection customers, to automatically send updates to customers on the program, as well as 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 date that the leaf collection will be conducted on their street, to ensure that residents have time to rake their leaves to the curb.

d. 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. 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.

The council has many programs relating to litter, the primary one being 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.

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 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 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

CHAPTER V

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.

2. Hazardous Materials Incidents

a. Overview of 2005 Hazardous Materials Incidents

The Hazardous Materials and Investigative Services Section personnel respond to reported incidents and investigate complaints of potential and actual releases, many of a non-emergency nature. During CY 2005, staff was involved with 586 complaints (34 more than the previous year). Four hundred forty complaints were petroleum product releases (160 more than the year before), and 146 complaints were various types of other product releases (79 more than the previous year). Sixty-nine cases directly impacted storm drains, creeks and/or streams. This is a 33-case increase from the previous year. (1)

b. Hazmat Response Team Information

The Fire and Rescue Department's Operations and/or Hazardous Materials and Investigative Services Section respond to all reported incidents of hazardous materials releases, spills and discharges. The county has a well-equipped hazardous materials response team. The primary unit operates from Fire Station 34 in Oakton, and three satellite units are stationed at Fire Station 1 in McLean, Fire Station 11 in Alexandria area of Fairfax County 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. (2)

The Hazardous Materials Response Team responded to 406 incidents in CY 2005 (a reduction of 33 cases from the previous year). The primary unit now operates from the Fairfax Center fire station (FS40). (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. (2)

c. Hazmat aftermath from Hurricane Isabel

The Hazardous Materials Response Team presented an overview of the aftermath of Hurricane Isabel to the Fairfax Joint Local Emergency Planning Committee. After the hurricane, special hazardous materials disposal facilities were set up in the Belle View community area and members of the team were present throughout the week following the hurricane. Natural gas leaks and fuel oil spills were the primary hazardous materials issues. Older homes had fuel oil located in basements or outside of the houses. Some tanks broke loose in the flood and were floating in the flood waters. (3)

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

According to a recent study, more than 50 percent of motorists change their own oil. Some of the oil is disposed of properly at a used-oil recycling center. Millions of gallons of used motor oil are being disposed of in garbage cans, sewers, storm drains and backyards – practices that can contaminate soil and local streams, rivers and bays. The U.S. Environmental Protection Agency believes that the largest single source of oil pollution fouling our nation's waters come from do-it-yourselfers. (4)

As a part of its ongoing effort to educate all Americans on environmental responsibility, the EPA recently 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 exits 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)

The recycled used motor oil is used for many purposes. Reprocessing is the most common method of recycling used oil in the United States. Seventy-five percent of used oil is being reprocessed and marketed to asphalts plants, industrial boilers, utility boilers, steel mills and others. Fourteen percent of used oil collected is turned over to re-refiners who return used oil to its original virgin oil state. Eleven percent of used motor oil collected is used in specially designed space heaters in automotive bays and municipal garages. (4)

Lynn Cooke, a service station owner in Washington, D.C., demonstrates quality control measures for used motor oil recycling to representatives from EPA, District of Columbia and API.

(American Petroleum Institute 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. 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.

Potential future shipments of nuclear radioactive waste by rail (and by truck) will travel through parts of the Washington, D.C. metropolitan area. Should an accidental or intentional incident occur, the effects and impacts could extend beyond that initial area.

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. (7)

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 exercise was conducted in October 2005. (2, 13)

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 a 50 percent increase in all of its hazardous material loads in the last decade. Of the 518,000 hazardous materials rail cars in 2004, CSX reports only nine released any portion of their contents as a result of derailments. (9) There was no mention if there were releases not resulting from derailments.

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 2006, with funding from Fairfax County and the Chesapeake Bay License Plate fund, the district expanded this water quality improvement program. Instead of using stencils and paint, volunteers now use an adhesive to apply pre-printed multi-colored labels to the cover of storm drains. The new labels read "No Dumping – Drains to Potomac River" or may be customized to reflect the name of the local watershed. The new labels are quicker and easier for volunteers to apply and the improved program has been enthusiastically received by volunteers, homeowner and civic associations, agencies and organizations.

The goal of the expanded program continues to be educating the community about the water quality impacts of storm drain dumping. The program also focuses on non-point pollution prevention. This is water pollution caused by our everyday activities. Each project includes a mandatory education component which must be completed prior to the storm drain labeling and involves distributing information about how to properly dispose of used motor oil, yard debris, household and pet waste to each home in the neighborhood. For schools and organizations, the district works with the project leader to come up with a unique way to educate the larger school or organizational community.

In 2006, this program involved 283 volunteers and educated over 50,000 residents about the connection between the storm drain and our streams.

NVSWCD also publishes a quarterly newsletter, *Conservation Currents*, with articles on environmental topics. 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))

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 and from the General Fund. In FY 2006, 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 2006, 21,471 users participated in the HHW program, disposing of 440,076 pounds of HHW. This represents a 6 percent decrease in the number of users compared to FY 2005 but, interestingly, also constitutes a 7 percent increase in the *weight* of HHW disposed over FY 2005 data. Program details are provided in Table V-1 below (11).

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

Fiscal Year	Participation (# of users)	HHW (pounds)	Cost per household
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 Collection and Recycling

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.

5. Commercial Hazardous Wastes

In FY 2006, the Solid Waste Management Program 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. 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. (11, 12)

6. Rechargeable Battery Recycling

In addition to the Solid Waste Management Program's 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 (10, 11). Nickel-Cadmium 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 each office of members of the board of supervisors, and program staff collects these batteries on a routine basis. As described in the Solid Waste chapter 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 Solid Waste Management Program has received special funding through the county's Environmental Improvement Program to conduct a series of five remote HHW collection events at locations throughout the county. In FY 2006, five of these events were conducted in the Mount Vernon, Mason, Dranesville, Hunter Mill and Braddock 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 $12,000 per event and they are dependent upon special funding from the board of supervisors.

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 V-2 below.

Table V-2

HOW TO REPORT ENVIRONMENTAL CRIMES

Type of Incident	Phone Number
ANY ACTIVE RELEASE OF MATERIALS INTO THE ENVIRONMENT 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.	**911**
HAZARDOUS MATERIALS-DANGEROUS 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.	**911**
HAZARDOUS MATERIALS-NO IMMEDIATE DANGER 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.	During working hours, call: **703-246-4386** After hours, call: **703-691-2131**
RELEASE OF ANY MATERIAL INTO THE ENVIRONMENT 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.	**703-583-3800**

Table V-2 (continued)

HOW TO REPORT ENVIRONMENTAL CRIMES

Type of Incident	Phone Number
EROSION AND SEDIMENTATION 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.	**703-324-1937**
HEALTH HAZARDS 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.	**703-246-2205**

D. LEGISLATIVE UPDATE

There are no legislative updates for this year's report.

E. COMMENTS

EQAC reiterates its recommendations from the 2005 Annual Report on the Environment:

1. EQAC continues to recommend an aggressive public education campaign on how to properly dispose of household/residential, commercial and industrial hazardous waste. Continuous partnering with the Northern Virginia Board of Realtors and solid waste haulers to distribute information to all new residents in the county is suggested. 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.

2. 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.

3. EQAC recommends continuing to advertise and educate 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

1. Fairfax County Fire & Rescue, Captain William Garrett, 6 October 2006 e-mail

2. Fairfax County Fire & Rescue, Chief Michael P. Neuhard, 17 June 2004 memo

3. Briefing presentation given to FJLEPC, Deputy Chief John Caussin, Fairfax County Fire & Rescue, 12 February 2004

4. American Petroleum Institute, *Used Motor Oil Collecting and Recycling,* www.recycleoil.org , viewed 16 August 2005

5. U.S. Environmental Protection Agency, Wastes-Used Oil Management Program, www.epa.gov/epaoswer/hazwaste/usedoil/ , viewed 16 August 2005

6. Summary provided by the Northern Virginia Soil & Water Conservation District, October 13, 2006.

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 16 August 2005

10. Fairfax County Web site; viewed 1 September 2005 www.fairfaxcounty.gov/dpwes/trash/recyclingtrash.htm

11. Fairfax County Department of Public Works and Environmental Services, 18 October 2006 e-mail from Jeff Smithberger, Director, Division of Solid Waste Collection and Recycling

12. Fairfax County Government, Business Hazardous Waste Web site, October, 2006, www.fairfaxcounty.gov/dpwes/trash/disphazcomm.htm

13. Fairfax County Fire & Rescue, Carolyn Ford, 1 November 2006 e-mail

14. Previous EQAC authors of this chapter and material

CHAPTER VI

ECOLOGICAL RESOURCES

VI. ECOLOGICAL RESOURCES

This chapter summarizes the status of ecological resources and the actions of public agencies and community 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 of supervisors. The actions and decisions of the Fairfax County Board of Supervisors 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 polices 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 last year's 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 complete document can be viewed at:
www.fairfaxcounty.gov/living/environment/eip/environmentalagenda.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 being taken 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 were possible. The following projects were in progress or completed in 2006:

- **English Hills:** Stabilization of 175 linear feet of stream bank at 7820 Manor Drive. Construction began in March of 2006 and is 80 percent complete.
- **Hollington Place:** Stabilization of 150 linear feet of stream bank using bioengineering techniques to alleviate erosion at 7926 Hollington Place. A proposal for the final design has been received from the A/E firm and is currently being negotiated.
- **Hunters Branch:** Stream bank stabilization. This project is in the scoping phase.
- **Runnymeade Subdivision:** Stabilization of 1,200 linear feet of stream bank using bioengineering techniques. Construction of this project began in May 2006 and is 30 percent complete.
- **Clarke's Landing:** Stabilization of 280 linear feet of stream bank using bioengineering techniques. Final design has been submitted for review; final community meeting was held on June 12, 2006.
- **Poplar Springs Court:** Restoration of 1,100 linear feet of stream bank using bioengineering techniques. A proposal for preliminary design has been received and is being negotiated.
- **Beach Mill Road:** Stabilization of 200 linear feet of stream bank using bioengineering techniques. Final construction related comments are being addressed and the Virginia Stormwater Management Program and Corps of Engineers permits are being acquired.
- **Bridle Path Lane:** Stabilization of 750 linear feet of stream bank using bioengineering techniques. Survey is complete and design work to commence under task order.
- **Swinks Mill Road:** Stream bank stabilization to provide structural protection at 819 Swinks Mill Road. Construction began in May 2006 and is 15 percent complete.
- **Balmacara Phase II:** Stabilization of 200 linear feet of stream bank to provide structural protection. Design is 90 percent complete.
- **The Colonies at Scott's Run:** Stabilization of 180 linear feet of stream bank. Design is complete, easement plats prepared and forwarded to Land Acquisition Division.
- **Mount Vernon Estates:** Stream restoration using bioengineering techniques. Design work on this project is 95 percent complete.
- **Hope Park Road:** Restoration of 1,000 linear feet of stream bank plus removal of an unauthorized landfill. Survey work is complete and design work is 2 percent complete.
- **Huntley Meadows:** Stream bank stabilization project using bioengineering techniques. This project is 100 percent complete,

with good results, insofar as the stream bank withstood the record flooding of the June 2006 storm event and immerged mostly intact.

- **Kirby Road:** Stabilization of 200 linear feet of stream bank. Design work began in May 2006.

b. Green Roof Technology

There are several vegetated roofs soon to be implemented by Fairfax County, one on an existing structure and two on new buildings. A vegetated roof demonstration project will be installed on part of the Herrity Building parking garage and is currently in the design phase. The Facilities Management Division with support and funding provided by Stormwater Management is managing this project. 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. Capital Facilities, also with support and funding provided by Stormwater Management, will be installing vegetated roof pilot projects on two new buildings. These buildings, Fairfax County's Bus Operations Center on West Ox Road and the Wolf Trap Fire Station, are both currently in the design phase.

Vegetated roof implementation will also be encouraged in an upcoming Public Facilities Manual amendment. Vegetated roofs are one of six Low Impact Development techniques currently in the process of being added to the PFM. Lists of suggested plants for both extensive (low-profile) and intensive (deep-profile) type roofs will be included in order to further facilitate design and implementation.

Additionally, Stormwater Management has several vegetated roof monitoring projects in the works. The demonstration roof on the Herrity parking garage will be monitored for several parameters, as will the currently functioning demonstration roof at the Providence District Supervisor's office. Stormwater Management is also giving support to a graduate student who is monitoring the privately owned Yorktowne Square Condominium vegetated roof/conventional roof comparison study site.

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 website at www.fairfaxcounty.gov/parks/.

a. Acquisition of Park Land by FCPA

The FCPA added nearly 160 acres in 2005 through a combination of purchases, dedications, transfers and donations. This brings the parkland inventory to a total of 23,677 acres (which equates to 9.4 percent of the land mass of Fairfax County). The largest portion of the added property was a transfer of over 125 acres from the board of supervisors. This transfer does point out the Supervisors' continued support for the land acquisition and stewardship programs of the Park Authority. Since 2002, the board of supervisors has conveyed over 2,750 acres to the Park Authority. Tables VI-1 and VI-2 lists all the properties acquired by the Park Authority in 2005.

Table VI-1. FCPA 2005 Acquisitions (Purchases and Dedications)

Parcel(s)	Acreage	District	Adjacent Park or Stream
PURCHASES			
John & Lynne Bellingham	0.4869	Providence	New urban park (w/Jones purchase)
Hogge Family	6.1	Mason	New neighborhood park
Paul L. Jones, Jr.	0.6225	Providence	New urban park (w/Bellingham purchase)
DEDICATIONS			
Rita Powell & Mark A. Johnson	0.7485	Sully	Cub Run
Dulles Creek Associates, LLC	3.0827	Hunter Mill	Merrybrook Run
Waples Mill Manor, LLC	20.0469	Providence	Waples Mill Park

Source: *Request for Input for Environmental Quality Advisory Council's Annual Report on the Environment, 2006 Report*, Letter from Michael A. Kane, Director, Fairfax County Park Authority, Fairfax County, Virginia, to James P. Zook, Director, Department of Planning and Zoning, Fairfax County, Virginia, July 19, 2006.

Table VI-2. FCPA 2005 Acquisitions (Transfers and Donations)			
Parcel(s)	**Acreage**	**District**	**Adjacent Park or Stream**
TRANSFERS (from BOS)			
	3.1	Dranesville	Dranesville Tavern
	3.69	Dranesville	Sugarland Run
	2.91	Hunter Mill	Symphony Hills Park
	7.37	Lee	Huntley Meadows Park
	14.93	Lee	Accotink Creek
	7.29	Lee	Accotink Creek
	17.2	Mason	Bren Mar Park
	4.44	Mason	Turkeycock Run
	6.74	Mount Vernon	Pohick Creek
	1.51	Mount Vernon	Southgate Park
	1.87	Providence	New South Railroad Park (combined with donations)
	13.9	Springfield	Rocky Run
	12.53	Springfield	Johnny Moore Creek
	0.15	Springfield	Piney Branch
	4.9	Springfield	Accotink Creek
	6.925	Sully	New park (historic Mount Gilead)
	5.0	Sully	Cub Run
	1.5	Sully	Rocky Run
	1.11	Sully	Frog Branch
DONATIONS			
Paul B. & Joan M. Baker	0.0413	Providence	New South Railroad Park
Sandburg Court Homeowners Association	0.0580	Providence	New South Railroad Park
Michel G. Feghali & Jennifer L. North	0.0468	Providence	New South Railroad Park
Neeraj Bhagat & Vandna Bhagat	0.0390	Providence	New South Railroad Park
Helen I. Rave	1.3774	Mason	Manassas Gap Railroad Park
Wedderburn Associates, L.C.	0.6348	Providence	Tysons Woods Park
Young Group & Peter M. O'Meara	0.9313	Dranesville	Pimmit Run SV Trail

Source: *Request for Input for Environmental Quality Advisory Council's Annual Report on the Environment, 2006 Report*, Letter from Michael A. Kane, Director, Fairfax County Park Authority, Fairfax County, Virginia, to James P. Zook, Director, Department of Planning and Zoning, Fairfax County, Virginia, July 19, 2006.

b. Natural Resource Management Plan

In past reports, EQAC recommended that the 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:
www.fairfaxcounty.gov/parks/nrmp.htm.

The second year of the implementation of the NRMP was completed June 30, 2006. Some of the highlight of year two included:

- Policy
    - Developed draft policy language on native plants and invasive plants.
    - Developed a draft stormwater features policy to set up criteria for evaluation of proposed stormwater features on parkland.
    - Began to list and document best practices for resource protection and management.
    - Established an inter-division team that reviewed policies and standard operating procedures related to beaver management.
- 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.

- NRMP Program
  - Secured $100,000 for invasives and $160,000 for trail mapping at the FY2005 Carryover in support of the board of supervisors' Environmental Agenda.
  - Continued to develop operations plan including roles and responsibilities for NRMP Section staff.
  - Planned the out-years implementation of the NRMP.
- Resource Assessments and Planning
  - Continued to evaluate resources on land under consideration for acquisition and during master planning and development.
  - Completed draft of the Sully Woodlands Regional Master Plan.
- Resource Management
  - Park Authority staff conducted a burn of the meadows on Pleasant Valley Road in Sully Woodlands on February 2006.
  - Developed plans for reduced mowing and natural meadow establishment.
  - Initiated trail mapping project.
- Invasive Non-native Species
  - Created a pilot volunteer program.
  - Developed brochures and web content on invasives.
- Water Resources
  - Completed a baseline inventory of stormwater features.
  - Continued implementation of Low Impact Development practices – five sites selected to have LID demonstration projects (as funding allows).
- Education
  - Published six stewardship brochures.

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, planners and project managers. The FCPA staff estimates that $3 million per year is needed. 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.

c. 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. Invasives projects occur at staffed parks and in select parks when volunteers can assist in the efforts. For example, FCPA's partnership with Earth Sangha, a local non-profit agency, continues at both Marie Butler Leven Preserve and Wilburdale Park.

While EQAC commends 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.

d. Riparian and Bioengineering Projects

The Fairfax County Park Authority, along with and in partnership with other agencies, continues to work on stream stablization/bioengeering projects. See the Water Resources Chapter of this report for descriptions of these projects. The stream bank stabilization projects were along Difficult Run near Georgetown Pike (completed November 2005), equestrian stream crossing on Difficult Run (completed spring 2006) and Barnyard Run stream stabilization at Huntley Meadows Park (completed spring 2006).

e. Easements

Easements are another way of protecting ecologically-sensitive properties. A number of organizations hold easements of such properties in Fairfax County (see below). FCPA also holds approximately 25 conservation easements totaling over 150 acres. A future Annual Report on the Environment will give further details on these easements.

The Fairfax County Park Authority, assisted by the Northern Virginia Conservation Trust, acquired a 41-acre conservation easement and purchase options on the historic property know as "Salona." Ten acres will be placed in active recreational use with the remainder used for passive recreation. Approximately two-thirds of the property consists of mature tree cover, which will be preserved under the FCPA plan to create a local park.

FCPA also acquired a number of trial easements during 2005 in support of the completion of the Cross County Trail and other trail projects.

f. Fairfax County Park Foundation

Fairfax County residents 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 our park system. If you are interested in giving a tax-deductible donation to the foundation, contact them at:

Fairfax County Park Foundation
12055 Government Center Parkway
Fairfax, VA 22035
(703) 324-8581
SupportParks@aol.com
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.

The NVRPA often partners with other organizations to meet its mission of caring for the environment, overseeing urban forestland, protecting water resources and preserving land for future generations. Some of these activities in 2005 included:

- U.S. Bureau of Land Management "Public Lands Appreciation Day" projects at Pohick Bay.
- Friends of the Occoquan and Chesapeake Bay Restoration Fund-sponsored Occoquan River Semi-Annual Cleanup Days at Occoquan, Fountainhead and Bull Run Marina.
- Alice Ferguson Foundation 16th Annual Potomac Watershed Cleanup Day at Pohick Bay.
- Virginia Division of Soil and Water Conservation's Urban Nutrient Management Program at NVRPA golf courses and athletic fields.
- The planting of 1,241 trees and shrubs by the Friends of the W&OD in conjunction with Dominion Virginia Power to offset losses on the Washington & Old Dominion Trail during utility maintenance.

Current information about the Northern Virginia Regional Park Authority can be found on its Web site, www.NVRPA.org/.

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. Members of Fairfax ReLeaf have testified to county officials and politicians that an unacceptably rapid rate of tree loss in Fairfax County continues; ReLeaf members have stated that the county has not taken effective steps to stem this loss of forest infrastructure. 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:

- Maintenance and improvement of air quality.
- Reduced heat island effects.
- Reduction of noise.
- Preserved human and wildlife habitats.
- Reduction of energy use.
- Reduction of surface runoff and improvement of water quality.

Fairfax ReLeaf remains very active in its efforts. For example, during fall 2005, ReLeaf:

- Worked in cooperation with the Mid-Atlantic Stake of the Church of Jesus Christ and Latter Day Saints and Earth Sangha to transform a deforested, Bradford pear forest into a elderberry, blueberry, sassafras and oak filled forest by a large drainage pond on the near the new Laurel Hill Golf Course.

- Planted 60 trees and shrubs, provided by the Fairfax County Department of Public Works and Environmental Services, to improve a riparian buffer area in the Rocky Run stream valley. This planting was done in an area that was being encroached by homeowners mowing into parkland. The new plantings will improve water quality in Rocky Run.

- Worked with the Oakton High School Eco-Club in replacing redbud, serviceberry and dogwood trees at the school. These students also learned about the invasive species of plants around their school property. These activities will improve the appearance of the school, provide habitat for wildlife and improve the environment.

- Worked with Eagle Scout Tom McPeek to plant a hillside near the new ball field in Wakefield Park. The trees will slow the runoff of rainfall

and reduce erosion on this hillside. Fairfax ReLeaf provided the trees and tree protectors for this Eagle Scout project.

- Worked at VolunteerFest with Volunteer Fairfax at Pine Ridge Park, removing weeds and vines, planting trees and mulching.

For further information on Fairfax ReLeaf, visit its Web sites at www.fairfaxreleaf.org or www.geocities.com/RainForest/5663. This 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 sixth year with funding allocated through FY 2007.

The Northern Virginia Conservation Trust was founded in 1994 as the Fairfax Land Preservation Trust. In 1999, the organization changed its name to the Northern Virginia Conservation Trust to better reflect the regional scope of its organization. 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 partnerships with Arlington County and the city of Alexandria; it 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 2006, NVCT has preserved 568 acres of open space in Fairfax County through easements, fee simple ownership and partnerships. Between June 2005 and June 2006, NVCT has obtained the following:

- Cafferty Easement, 5+ acres in Dranesville District, December, 2005.

- Eight Oaks Easement, 2.0+ acres and historic house in Dranesville District, December 2005.

- Salona Easement, 41+ acres surrounding a historic residence in Dranesville District, December 2006.

NVCT continues to work toward reaching agreements on more conservation easements. Some that are possible in the future include locations in Alexandria, Reston and McLean.

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 thousands of native trees, the removal of tons of invasive plants, birding trips and guided hikes. NVCT's naturalist-led kayak tours, part of its innovative environmental and conservation education program, continue to be hugely successful.

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, www.nvct.org.

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 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. They were 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 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 our 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 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, which 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. VOF, as the name indicates, is also a public foundation and can "…accept, hold, and administer gifts and bequests of money, securities or other property, absolutely or in trust, for the purposes for which the Foundation is created." The Act has language regarding role and function, but a good summation of the VOF legislative charge may be that VOF is steward of the natural and cultural heritage land resources of Virginia on behalf of present and future residents.

The Virginia Outdoors Foundation currently holds six easements in Fairfax County as shown below:

Table VI-3. Easements Held by VOF 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**	

***** 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.

Source: *Fairfax County Annual Report on the Environment*, Letter from Erika Richardson, Stewardship Specialist, Virginia Outdoors Foundation to Noel Kaplan, Department of Planning and Zoning, Fairfax County, Virginia, August 1, 2006.

Additional information about VOF can be seen at its Web site: www.virginiaoutdoorsfoundation.org/

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.

All Agricultural and Forestal Districts are required to have a conservation plan. NVSWCD develops soil and water quality conservation plans that comply with the Chesapeake Bay Preservation Ordinance requirements. They include best management practices to reduce: sediment pollution from erosion; 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 within all Resource Protection Areas and along other streams. Plans are updated and technical assistance is provided as needed.

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 residents a package of native tree and shrub seedlings for a small cost.

a. Fairfax County Soil Survey

Fairfax County used to have soil scientists on the staff, but in a budget cut several years ago, the office was abolished. In past Annual Reports, EQAC deplored this move and recommended that soil scientist expertise be bought back to the county staff. While the board of supervisors did not exactly follow this recommendation, it did satisfy the intent of EQAC's recommendation by funding NVSWCD to finish the county's soil survey. The funding for this effort became available to NVSWCD in Fiscal Year 2004 and will continue through Fiscal Year 2007. The field surveys will be complete in 2007 and the final reports and maps will be available in 2008.

NVSWCD is working with the National Resources Conservation Service in accomplishing the update of the Fairfax County soil survey. The board of supervisors provides money to NVSWCD to hire a soil scientist who is a member of the survey team. It also funds NRCS for its assistance ($110,000 per year), which consists of two NRCS soil scientists on site and soils expertise and resources from throughout the agency, including a soils data quality specialist, a digitizing unit, the National Soil Survey Lab in

Nebraska and the National Soils Information System database. NRCS matches the funds provided, thereby leveraging the funds provided by the board of supervisors.

The Fairfax County soil survey update will modernize an existing soil survey. The update will enable the GIS system to use the soil survey information (a capability that did not exist). As a result, this update will enable planners, individuals, scientists and anyone involved in land use planning to make smart land use decisions that will work to save money and conserve valuable natural resources.

The resulting database and maps will incorporate the new information and scientific knowledge acquired about soils in the last 30 years. However, the updated maps will not eliminate the need for site-specific surveys when construction or changes in site use occur. The maps will better describe, characterize and define the properties of the soil components within existing delineations. The maps will also show that inclusions of other soil types can exist, but will not show the extent of smaller inclusions. Site-specific surveys will be need for this fine detail.

One new effort that is being done under the soil survey is the characterization of man-made soils (urban soils). The characteristics of urban soils can be quite different from native soils. One significant difference is the ability of water to infiltrate urban soils (much less than many native soils). Knowing where urban soils exist and the type of urban soil can be critical to stormwater control efforts that incorporate infiltration of water (rain gardens, grassy swales, etc.).

In a similar fashion, neighboring counties are updating their soil maps. Loudoun County updated its soil maps and incorporated those data into their GIS system. Loudoun County, however, recognizes that the soils map needs to be continuously updated (based on field site inspections) and has a county Soil Scientist to provide site-specific soil interpretations. In a like fashion, Fauquier County has also updated its soil survey and incorporated this information into its GIS. Fauquier county also have a county Soil Scientist Office to provide site-specific information.

The Soil Survey is progressing well and on schedule. As of July 2006, the mapping and data collection have been completed and are undergoing quality control and assurance processes and waiting scanning and digitization by the USDA-NRCS state office in Richmond. In addition, the special study to characterize the large percentage of disturbed soils in the county is nearly completed. Disturbed soils no longer have their original structure, are generally denser and less permeable than undisturbed soils and create more runoff than undisturbed soils. Knowing the behavior and characteristics of human disturbed soils is vital for understanding the

stormwater management and erosion issues that will affect Fairfax County in the future, especially as efforts towards meeting the Chesapeake Bay Agreement intensify.

The NVSWCD soil scientist provides additional services to Fairfax County. He conducts infiltration studies for proposed infiltration practices, such as rain gardens and porous pavers. Additionally, the NVSWCD staff provides soils information to consultants, developers, realtors, homeowners and the public.

Now that the soil survey is just about complete, a number of tasks are needed in order to successfully transition to using the new information in the updated soil survey:

- Integrating the new survey maps and information into the county GIS system.
- Creating county-specific ratings for the new soils and to reassign problem classes and other ratings to the new soil types.
- Making the necessary changes to the County Code.
- Training county staff members who deal with soil issues on the use of the new survey.
- Educating the private sector on the new soil survey information and its appropriate and effective use.
- Developing a process for maintaining and updating the soil survey as land uses change.

In addition to these tasks identified during the transition period, there will be a continuing need in the county for the expertise of a soil scientist to:

- Maintain and update the county's soil survey, including coordinating with USDA-NRCS and GIS.
- Evaluate and interpret soils information.
- Conduct soils investigations.
- Retrieve and apply the appropriate soils information for given situations.
- Conduct soils-related research in order to meet county needs, especially to expand knowledge on the behavior of human disturbed soils.

- Evaluate and test soils for infiltration capability, especially for siting and designing LID practices.

- Provide information and advice to county staff, land managers, the development community and the general public.

- Develop and lead training and education programs on soils and the appropriate and effective use of soil maps and soil information.

Like our neighboring counties, Fairfax County also needs to maintain expertise in soils. At present, funding for the expertise will end after Fiscal Year 2007. The expertise provided by the soil scientist will be required to accomplish the tasks listed above. Without this expertise, problems will likely develop as uses are changed on sites. In addition, detailed knowledge of soils will be critical to future stormwater control efforts as well as other activities. One just needs to look at the slope failure several years ago on the widened Telegraph Road to see the importance of knowing soils and their characteristics. In this case, the failure of the slope due to clay soils jeopardized houses on the top of the hill. EQAC therefore recommends that the board of supervisors continue to fund soil scientist expertise past Fiscal Year 2007.

EQAC notes that the county staff supported this recommendation in its response to 2005 EQAC Annual Report on the Environment.

13. Fairfax County Wetlands Board

If you own property on the waterfront in Fairfax County, you may need a permit 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 wetlands. Land disturbing activities include the following:

- Any construction project on or adjacent to a tidal body of water.

- Any construction project in which fill material is place in or near wetlands.

- Construction of bridges, tunnels or roads which may have an impact on wetlands, either tidal or non-tidal.

- Projects designed to protect property adjacent to shorelines

The Wetlands Board adopted the Tidal Wetlands Mitigation and Compensation Policy in 2005 to ensure conformance with the spirit and the intent of the Chesapeake 2000 Agreement, which seeks, among other things, "to achieve a no net loss of jurisdictional tidal wetlands acreage and function through regulatory programs..." Upon seeking to encourage wetlands permit applicants to avoid, minimize and reduce tidal wetland losses, the Wetlands Board policy provides for compensatory mitigation when impacts are unavoidable. Because Fairfax County has so little tidal land available which could be used for wetland creation or mitigation, the board envisioned that a potential means for wetlands applicants to mitigate and compensate for future tidal wetland losses could be through the establishment of an in lieu fee fund. Thus, the Wetlands Board and the Northern Virginia Regional Park Authority have entered into a Memorandum of Understanding so that NVRPA can accept in lieu fees from future wetlands permit holders as the compensatory mitigation for unavoidable tidal wetlands impacts. On May 22, 2006, the Wetlands Board voted to adopt a Memorandum of Understanding between the Northern Virginia Regional Park Authority and the Wetlands Board.

The Wetlands Board is continuing to work on practical mechanisms to implement the Tidal Wetlands Mitigation and Compensation Policy.

The Wetlands Board is actively involved with the evaluation and the ultimate resolution of three wetlands ordinance violations that have occurred on Little Hunting Creek.

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
www.fairfaxcounty.gov/dpz/environment/wetlands.htm

14. Virginia Department of Forestry

The Virginia Department of Forestry has provided forestry related services in Fairfax County for over 30 years. It is also participating in several efforts aimed at improving riparian areas and stream bank stabilization projects. In these efforts, VDOF partnered with the Northern Virginia Soil and Water Conservation District, the Department of Public Works and Environmental Services and the Reston Association. See the Water Resources chapter in this report for further details. Also, see the Water Resources chapter for details on VDOF riparian buffer reforestation efforts.

The Virginia Department of Forestry is the lead state agency to oversee the planting and recordation of forest buffers planted in the commonwealth of Virginia. In 2005, approximately 3,500 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, Difficult Run Community Conservancy, elementary school children, private landowners and Fairfax ReLeaf.

The Virginia Department of Forestry participates in the Fairfax County Arbor Day, the last Saturday in April each year. The county earned again, for the 22st 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 Virginia Department of Forestry. Tree seedlings are distributed by VDOF to residents attending the Arbor Day celebration. In 2005, 500 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. Each year 500-700 seedlings are given to residents 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 plans are reviewed by VDOF; these efforts support the management of forested land for conservation purposes. Six A&F plans covering 400 acres were prepared in 2005. VDOF also provides forestry management advice to homeowners associations and civic groups. In 2005, four community forestry plans were prepared covering 100 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 30 applications and plans in 2005.

VDOF maintains an active public education and outreach program. Audiences range from schools 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 2005, VDOF conducted 25 talks on the general benefits of urban forests and three workshops on rain gardens and buffers.

15. Virginia Department of Transportation

VDOT mitigates unavoidable impacts to water resources within Fairfax County that occur during highway construction projects as required by federal and state laws and regulations. The Virginia Department of Transportation is currently monitoring three wetland mitigation projects within Fairfax County.

- In the Dranesville District, VDOT created a wetland project along Dranesville Road near Sugarland Run to mitigate for construction impacts from the Fairfax County Parkway.

- In the Braddock District, VDOT constructed a wetlands project in 2003 near the Robert Parkway overpass and Virginia Railway Express—Burke Station.

- In the Sully District, VDOT created a wetland near Lee Highway and Big Rocky Run.

These sites were created to mitigate unavoidable wetland impacts from construction of the Fairfax County Parkway, Roberts Parkway Bridge Overpass, the Springfield Interchange and the Route 29 Bridge replacement over Big Rocky Run. All sites are undergoing five-year monitoring as required by federal and state permits. Two years of monitoring at the Dranesville District and Sully District sites are complete and the third year of monitoring is in progress. The first full year of monitoring is complete at the Braddock District site and the second year of monitoring is in progress. The results for all three sites have been impressive with each site fulfilling success criteria outlined in the water quality permits. These sites provide a water quality benefit in these watersheds as well as habitat for a host of amphibians, birds and mammals.

VDOT, in partnership with the Virginia Transportation Research Council and the University of Virginia, had been involved with an animal crossing study of two underpasses on the Fairfax County Parkway that were built specifically for deer and other wildlife. The study, completed last year, found at least one of the underpasses to be successful in facilitating deer passage. Additional research is now under consideration to evaluate methods to improve and increase the dataset on animal-vehicle collisions in Virginia using Personal Digital Assistant/Global Positioning System units.

VDOT continues to use bioengineering techniques for transportation projects with associated riparian impacts. Stream restoration on a Pohick Creek tributary near Lorton Road was completed in the spring of 2005 as a part of VDOT's Richmond Highway widening project. VDOT is assessing other potential stream restoration sites within the state's right-of-way to compensate for stream impacts from road construction projects. VDOT also seeks opportunities to partner with Fairfax County agencies and private property owners on future bioengineering projects. EQAC encourages the Northern Virginia Soil and Water Conservation District and the Department of Public

Works and Environmental Services to work with VDOT to identify possible stream restoration projects and to partner with VDOT in the accomplishment the identified projects.

VDOT includes landscaping in several construction projects to enhance road improvements. Fairfax County projects include:

- Ox Road between Burke Lake Road and Davis Drive (completed April 2004 and under a three-year establishment period).

- Ox Road between Davis Drive and the Prince William County Line (completed May 2006 and under a three-year establishment period).

- Gambrill Road Park and Ride Lot (completed June 2005 and under a two-year establishment period).

- Richmond Highway widening from Lorton Road to Telegraph Road (completed October 2005 and under a three-year establishment period).

- Lorton Road between Richmond Highway and Silverbrook Road (anticipated construction completion date is August 2006).

VDOT maintains about 22 acres of flowering bulbs, wildflowers and native grasses planted throughout Fairfax County. These areas are reseeded and controlled for week invasion as needed throughout the growing season.

Controlling invasive, non-native vegetation along interstate and primary routes in Fairfax County is a major initiative for the Northern Virginia District of VDOT. Once satisfactory control is achieved, VDOT evaluates the location as potential candidate reforestation and wildflower/native grass planting projects. EQAC continues to commend VDOT on the invasive plant removal and replacement effort.

16. Urban Forestry

a. Urban Forest Management Division

In 2004, in addition to carrying out its core services relating to land development (see Forest Conservation Section update) and forest pest management (see Forest Pest Section Update), in 2005, Urban Forest Management focused on several other projects that included:

Working with the Tree Commission to Develop a Tree Action Plan.

The Tree Action Plan represents a long-range strategic plan for the county's urban forestry program. As directed by the board of supervisors' Environmental Committee in September 2005, UFMD worked with the Fairfax County Tree Commission to develop specific recommendations on how to implement the conceptual-based Tree Commission Tree Action Plan Framework. UFMD developed 76 action steps in response. For more information on this topic please see the Summary of Tree Commission Activities for 2005 below.

Strengthening Tree Preservation Policies and Procedures.

- In February 2005 the board directed the Urban Forest Management Division, DPWES and the Zoning Evaluation Division of the Department of Planning and Zoning to review and strengthen tree conservation policies and procedures used during the review of zoning cases. As part of this effort, a committee consisting of representatives of UFMD, the Zoning Evaluation Division, DPZ, the Office of the County Attorney, the Planning Commission and the Providence Magisterial District BOS Staff was formed to examine the effectiveness of model proffer language relating to tree preservation and landscaping.

- Efforts to develop suggestions regarding proffers will help developers communicate very specific intentions regarding tree preservation, conservation and removal efforts and the county's ability to ensure compliance with these commitments during construction activities. It is anticipated that commitments that will be offered by developers during the zoning process will provide an enhanced system of assigning monetary values to trees to be preserved and using these values as the basis for establishing tree bonds which developers will post with the county to ensure the preservation of proffered trees and tree save areas.

- When finished, this effort will result in a suggested approach that developers could apply to tree conservations matters within their rezoning proposals; this approach would not be formally adopted as an expected standard commitment but would instead be offered for consideration as an effective approach to achieving a desired outcome. This effort is expected to be completed in 2006.

Setting up a County Fund for Tree Preservation and Planting

- This project established a funding mechanism to facilitate the expenditure of donations from zoning cases and other source to fund

a countywide tree planting program for purposes of improving the county's air quality. On June 20, 2005, the board of supervisors directed staff of DPWES, the Department of Planning and Zoning and the County Attorney's Office to investigate the possibility of creating a funding mechanism for a countywide tree planting program through the use of reparations obtained from violations of tree save commitments, cash proffers and in-kind proffer commitments obtained during the land development process.

- Land Development Services is establishing criteria to approve track and report on tree-related projects funded through the Tree Preservation and Planting Fund. It is anticipated that this fund will be used to support tree-related activities such as:

  - Tree planting projects on county properties and on Virginia Department of Transportation rights-of-ways.

  - Grants to support the activities of non-profit tree planting groups.

  - Natural landscaping-related projects on county property.

  - Development of educational materials and workshops.

  - Implementation of a future local "Heritage, Memorial, Specimen and Street Tree" ordinance.

- The Tree Preservation and Planting Fund and associated standard operating procedures are expected to be finished and put into use in 2006.

Developing a Tree Canopy Measure for the 2007 Metropolitan Washington D.C. Air Quality Plans.

- In response to a June, 2005 board matter directing staff to prepare a report that delineates what urban forestry-related practices, including tree planting, the county can use to improve air quality and how these practices can be included in the air quality management plans, UFMD organized several meetings that gathered urban forestry official from jurisdictions from Northern Virginia, USDA Forest Service researchers, Virginia Department of Forestry representatives and regional non-government organizations to examine what should be done to build stronger links between urban forestry practices and federal Clean Air Act regulations.

- From these initial meetings, a more formal group, called the Northern Virginia Urban Forestry SIP Work Group emerged to examine what steps Virginia jurisdictions should do to take advantage of new U.S. Environmental Protection Agency policy approving "tree canopy programs" as "promising and emerging" voluntary measures that can receive limited offset credits (up to 6 percent of total) in Ozone mitigation programs. In 2006, the NOVA UF SIP Group is expected to contribute to a larger effort organized by the Metropolitan Washington Air Quality Committee to examine this issue.

Natural Landscaping Committee

- On June 21, 2004 the board directed staff to identify county properties where natural landscaping could be used to reduce maintenance practices that can cause harmful environmental impacts such as air pollution and to reduce the need and expense of mowing, pruning, edging and using fertilizers, pesticides and herbicides. Staff was asked to prepare a related report with a proposed countywide implementation plan. In response, the county executive tasked UFMD with a convening the Natural Landscaping Committee to identify practices, policies and a Countywide implementation plan. A final report and recommendations was prepared and presented to the board's Environmental Committee and approved by the BOS on July 11, 2005. The board directed the county executive to commission a multi-agency group to:

    - Update the palette of natural landscaping techniques and practices as new information and research emerges.

    - Establish formal guidelines for retrofitting the landscapes of county properties both with and without developed facilities.

- Develop natural landscaping guidelines and specifications for new facilities.

- Draft a countywide Natural Landscaping Policy to communicate the purpose, goals and importance of natural landscaping features on county properties.

- Implement a five-year natural landscaping plan in an aggressive but cooperative fashion.

- Produce an annual progress report that evaluates the level of cost-effectiveness and benefits that specific natural landscaping practices, techniques and projects are likely to provide.

- Submit natural landscaping projects to the ECC for possible inclusion into the annual Environmental Improvement Program.

Northern Virginia Urban Forestry Roundtable

- The lack of regional communication over urban forestry issues is thought to have 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 a regional conference on trees and air quality plans in November of 2005. NVUFC activities are expected to increase in 2006.

b. Forest Pest Section Update

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 community involvement programs.

- Biological: the release and monitoring of gypsy moth parasites and pathogens.

- Chemical: the aerial and ground applications of Diflubenzuron and Bacillus thuringiensis on high infestations.

- Educational: the self-help program and lectures to civic associations and other groups.

In calendar year 2006, gypsy moth caterpillar populations increased compared to previous years. Insect populations are cyclical in nature and it is impossible to determine whether this increase is a sign that outbreak populations are imminent. While gypsy moth populations increased in 2006, there was no defoliation in Fairfax County; for the first time in several years there was measurable defoliation reported in other areas of the commonwealth of Virginia. According to the Virginia Department of Agriculture and Consumer Services, there were 13,000 acres of defoliated forest in the state. No defoliation numbers are currently available for the United States, however, it is expected that they will increase dramatically. The gypsy moth program staff will continue to monitor populations in the fall of 2006 and treatment is very probable in 2007.

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 District 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 2005–2006 monitoring effort indicated that no aerial treatment was required in the spring of 2006.

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.

Emerald Ash Borer

The emerald ash borer (Agrilus planipennis) is an exotic beetle from Asia and 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 established a quarantine area around the infestation spot in order to contain the pest. 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 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 2004.

On December 12, 2003, the Commissioner of VDACS added the emerald ash borer to the list of insects that can be controlled by service districts. On January 26, 2004, the board of supervisors directed Forest Pest Section staff to coordinate with VDACS in implementing the Emerald Ash Borer Eradication Program. Staff of the Forest Pest Program began assisting VDACS shortly after the insect was added to the list and board direction was given. FPP duties included surveying the area around Colvin Run Elementary for ash trees, conducting public notification meetings, preparing maps for tree removal contractors, monitoring contracted services, preparing mailings and responding to media inquires.

Since the trees were removed in 2004, staff has been monitoring for the presence of adult beetles. Monitoring is conducted by placing 80 “sentinel” ash trees at various areas around the school site. An additional monitoring site was established in the Fort Hunt area of Fairfax County and was in response to a suspected infestation on the Maryland side of the Potomac River. At the end of the summer, the sentinel trees will be removed and checked for life stages of the emerald ash borer. This effort would not have been possible except for the cooperation of the National Park Service.

The Maryland Department of Agriculture has maintained an emerald ash borer monitoring program similar to efforts in Fairfax County. MDA recently examined its sentinel trees in Prince Georges County and found evidence of emerald ash borer larvae. This discovery is significant since it means that the insect is surviving and reproducing in Maryland. It is too early to say what impact this will have on Fairfax County; however, it is of concern due to the proximity of Prince Georges County, Maryland and Fairfax County, Virginia. Staff is awaiting guidance from state and federal agencies in this matter; however, it is likely that monitoring efforts for this insect will continue for the foreseeable future and will be expanded.

c. Forest Conservation Section

In 2005, the FCS continued to serve its traditional customers: residents, 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 and the School Board.

The year started out with two vacant positions--an Urban Forester II and an Urban Forester III. This diminished workforce was a bit of a strain on the remaining staff until both positions were filled by May 2005 with sharp and highly qualified candidates from outside the agency. After a brief orientation period for the two prodigies, the staff was once again whole around mid-year.

Also in May 2005, the Forest Conservation staff launched into a new computerized tracking system for the numerous and diverse requests for assistance the section receives. This automated tracking and filing system, known as the Internet Quorum or IQ system, would provide a more efficient means of record-keeping and request processing specifically designed for the workload of the Forest Conservation Section. Initially, the conversion learning curve was difficult and some system adjustments had to be made. However, by the end of the year, staff was more comfortable with the new technology, which seemed to be working fairly well.

Table VI-4 summarizes the workload of the FCS based on the requests for assistance that were completed for FY 2003, 2004 and 2005. These figures demonstrate the number of requests for assistance in 2005 appear to have decreased noticeably (10 percent) from the previous years. This apparent decline is a misnomer due to the migration to the IQ system in tracking the FCS workload. For example, re-inspections of project releases are recorded under the same IQ numbers instead of under new numbers for consistent record-keeping. Similarly, many “Other” requests were not tracked at all

during the transition period because of uncertainty in the system's capabilities. Subsequently, many improvements in the use and operation of the IQ system have made it a much more efficient and accurate tool.
In FY 2005, as in FY 2004, requests for assistance increased from previous years for Department of Planning and Zoning requests, as did hazardous tree complaints (many outside our jurisdiction) with the advent of more stormy weather patterns. It is anticipated that FCS will continue to spend a significant percentage of staff time on zoning cases in 2006 and subsequent years. It is anticipated that there will be more requests for plan review assistance with by-right and infill plans as tree cover and tree protection issues become more complicated.

Table VI-4.
Urban Forest Management Workload,
2003 through 2005

Type of Assignment	Number of Completed Requests		
	2003	***2004***	***2005***
Waivers	67	64	56
Zoning Cases	140	191	206
OSDS Requests: Plan Review	736	677	651
OSDS Requests: Site Inspections	732	663	620
Other (BOS, FCPA, Other County Agencies, etc.)	628	610	431
Hazardous Trees	15	17	19
Total Complete	**2,318**	**2,222**	**1,983**

d. Tree Commission

In 2005, Tree Commission activities focused on generating the Tree Action Plan that Chairman Connolly charged it to develop in December 2004. The Tree Action Plan represents a long-range strategic plan for the county's urban forestry program.

By April of 2005, the Tree Commission had approved a draft plan which was presented to Chairman Connolly in June 2005 and to the board's Environmental Committee in September 2005. The Environmental Committee directed the Urban Forest Management Division to develop specific actions to implement the conceptual goals and strategies contained in the Tree Commission Action Plan Framework document. In response, UFMD, in coordination with a subcommittee of the Tree Commission staff, developed 76 action step recommendations to accompany the Tree Commission Action Plan Framework document.

In December 2005, after reviewing the 76 actions step recommendations and surmising that these had significant potential to impact the policies and practices of multiple county and Virginia agencies, local non-governmental organizations and the land development industry, the board's Environmental Committee directed UFMD to form an enlarged "Working Group" (TAP Work Group) comprised of representative from various urban forestry program stakeholders to work collaboratively on the Tree Action Plan. The board's Environmental Committee charged the TAP Work Group to:

- Examine the feasibility of the concepts and strategies contained in the original Tree Commission Action Plan Framework.

- Examine the feasibility of implementing the 76 actions step tactics prepared by UFMD.

- Prepare implementation plans for the concepts and actions that are found to be feasible from both the Framework and 76 action steps.

The Tree Action Plan Work Group is scheduled to meet throughout 2006 and it is anticipated that it will submit a final report with recommendations for review by board's Environmental Committee in late 2006.

In 2005, the Commissioners continued to use 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 continues 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. Summary of Status of Tree Preservation Enabling Legislation

In light of continued opposition encountered during recent Virginia State Legislative Assemblies to amend the tree replacement provisions of § 15.2-961 to include tree preservation requirements, the board of supervisors decided not to include a specific tree preservation proposal in the 2005 Legislative Program. However the board did forward a supporting position for tree conservation legislation as part of the 2005 Legislative Program.
Past recommendations made by the Tree Preservation Task Force, the New Millennium Occoquan Watershed Task Force, the Tree Commission and the Environmental Quality Advisory Council, coupled with certainty that the County's efforts to protect air, water, soil and wildlife resources will be extremely difficult without concurrently protecting trees and forest covers,

virtually ensures that Fairfax County will continue to seek opportunities to submit and promote tree preservation legislation.

f. Status of grant proposal for satellite mapping of the County's tree cover and analysis of tree cover data

In 2005, Urban Forest Management continued efforts to delineate the distribution of naturally occurring and landscaped vegetation, using the National Vegetation Classification System. However, this project received less intention than in previous years due to staff hours needed to addresses multiple board matters dealing with tree preservation, air quality, natural landscaping etc. Since the NVCS tree cover mapping is prerequisite to implementing multiple aspects of the Tree Action and the countywide Urban Forest Management Plans, it is anticipated that Urban Forest Management will need to devote considerable resources to the mapping effort in 2006 and subsequent years.

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 2005 EQAC Annual Report on the Environment, there have been only two changes to the A&F Program. The number of local districts increased from 41 to 43 while the number of state districts remained constant at two. The two new districts are in Great Falls (about 24 acres) and a horse farm off Route 29 just east of the Prince William County line (about 105 acres). Total acreage in A&F districts increased from about 2,805 acres to about 2,934 acres.

18. South Van Dorn Street Phase III Road Project

The U.S. Army Corps of Engineers issued a permit for the construction of South Van Dorn Phase III on May 28, 1996. Conditions contained in the permit required that no construction could start on the roadway until several conditions were completed. Three of these conditions are aimed at protecting Huntley Meadows Park. All three of these conditions were satisfied by Fairfax County, construction was completed and the roadway opened to traffic on April 26, 2005.

One condition is that seven parcels of land (102 acres) adjacent to Huntley Meadows Park must be purchased by Fairfax County. This is in lieu of creating wetlands for the five acres of wetlands that will be destroyed in road construction. These 102 acres contain about 69 acres of wetlands and 33 acres of uplands. This action will ensure preservation of the wetlands contained in this 102-acre tract as well as provide a valuable addition to Huntley Meadows Park.
The county now has possession of these seven parcels of land, which will be turned over to FCPA to become part of Huntley Meadows Park. The Corps also required that this land remain natural (as is the rest of Huntley Meadows Park).

Another condition by the Corps required stormwater management improvements on eight ponds in and around Greendale Golf Course. The last pond, at the intersection of South Van Dorn Street and King Centre Drive, was completed in June 2002.

A third condition by the Corps required that Fairfax County submit a Monitoring and Maintenance Plan for these stormwater improvements. The plan details the monitoring and maintenance requirements for a ten-year period. The Corps approved the plan in October 2001. The monitoring station was installed in July 2002. The initial three years of monitoring are complete. In lieu of further chemical monitoring, the county is proposing to make a contribution to the Northern Virginia Soil and Conservation District to complete a streambank restoration project in the vicinity. The remaining cost of the streambank restoration project (Kingstowne II) is proposed to be funded by a grant from the Virginia Aquatic Resources Trust Fund, which is administered by the US Army Corps of Engineers. The Nature Conservancy will likely provide project implementation.

C. COMMENTS AND RECOMMENDATIONS

COMMENTS

1. In past Annual Reports, EQAC recommended that the county board of supervisors emphasize public-private partnerships that use private actions such as purchase of land and easement 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. EQAC notes that the MOU was for a three-year period and this period is over. While the board of supervisors continues to fund the public-private partnership with NVCT, no new MOU has been put into place by Fairfax County. Since this interjects uncertainty into the future of this program, and the program has proved its value, EQAC believes that a MOU covering a three-year or five-year period be put into place.

2. In past Annual Reports, EQAC recommended that the county 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 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.

RECOMMENDATIONS

1. Fairfax County no longer has dedicated Soil Science staff. EQAC in the past recommended that the board of supervisors reestablish such dedicated staff. The board of supervisors did not establish staff positions in response to this EQAC recommendation; however, they did provide funding to the Northern Virginia Soil and Water Conservation District for mapping of the county's soils. The funding is through 2007. This enabled NVSWCD to provide the needed expertise. There is, however, a continuing need for this

expertise in the county past 2007. The incident on Telegraph Road where a hillside slid into Telegraph Road and endangered homes at the crest of the hill points out the soils problems that exist in the county. The increasing urbanization of the county has created new types of soils – urban man-made soils. These soils can have different characteristics in water infiltration and erosion. Therefore, as various projects are started in these soils, including stream restoration and other water control measures, expertise in these soils are needed in the county. At present the only place where there is dedicated soil science staff is in NVSWCD. EQAC therefore recommends that the board of supervisors continue the agreement with NVSWCD past 2007 to provide dedicated soil scientist expertise. This is the same recommendation as in the 2005 Annual Report on the Environment. The county staff response to this recommendation fully supports EQAC's position. In addition, the FY 2008 Environmental Improvement Program (item EIP08-WQ07-8(B)) recognizes the need for retention of soil science expertise beyond the completion of the county soil survey.

2. 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 believes 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 need be found from internal FCPA staff assets. A number of projects in the FY 2008 Environmental Improvement Program would support FCPA Natural Resource Management efforts. Project EIP08-PT08-01(B) addresses the Phase 1 effort described above.

3. Despite continued opposition encountered during the 2002, 2003, 2004 and 2005 Virginia State Legislative Assemblies, EQAC continues to recommend that the Virginia State Code § 15.2-961 be amended to include tree preservation requirements. Mature trees provide a number of benefits to the environment and the quality of life in Fairfax County. These benefits include improved air quality and improved stormwater management. The value of preserving trees during the development process (versus cutting

them and replacing with small plantings) is too great to give up on fighting to get tree preservation legislation.

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ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VII

WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY

VII-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:

- When the animals threaten human life or livelihood.
- When the animals depress the density of, or destroy, particular favored species.
- When the animals are too numerous for their own good.
- 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:

- 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.
- 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.

- 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.

- 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 VII-1-1).

Table VII-1-1
Deer Density 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. 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 this 395 square miles, about 140 square miles is wooded and open land and some three square miles is 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 VII-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 VII-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

(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 196) 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 show 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 VII-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.

Table VII-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

(Source: Report 1993-2001, Michael Uram, Fairfax County Police Department.
Report 2002-2004, Earl Hodnett, County Wildlife Biologist.
Report 2005, Emily Yance-Houser, FCPD.)

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.

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 VII-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.

iii. Disease

Another problem associated with deer overabundance is the prevalence of Lyme Disease. See Section VII-4 below in this chapter for a discussion of Lyme Disease.

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.

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:

- 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.

- 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.

- 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.

- 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:

- 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.

- Cultural carrying capacity, i.e., a level that is driven by human concerns (the population that can be tolerated by the community at large).

- 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.

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. Once again, the number of deer removed from the population by this method is not sufficient to have more than a modest local effect. 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 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 has given 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 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 has identified and begun testing at additional test sites, but these also have problems that render 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. 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: www.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 VII-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 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 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 Animal Services Division advises 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 Animal Services Division of the Police Department prepares 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 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. **This year, the Northern Virginia Regional Park Authority has declined scheduling further managed hunts on NVRPA sites in the hope that an enhanced sharpshooter program can achieve the necessary reductions in herd size. This effort will have to be carefully monitored, since, if this approach is not effective, the regional parks will become a breeding reservoir for deer herds that will emerge to adversely impact nearby**

residential communities and Fairfax County parks. As the above data show, managed hunts are more cost-effective per animal removed and the most feasible way of removing a large number of animals in a short time period.

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. 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. **However, the recent decision of the Regional Park Authority to drop managed hunts has the potential to substantially reduce these previous benefits.**

The Fairfax County Park Authority has more recently become 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. For the most recent year, 854 deer were harvested using archery equipment. Another 119 deer were taken under the county's Urban Archery Program. This reduction of the county's deer herd by 973 individuals 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 impossible 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 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. In mid-November, 2000, the board of supervisors approved $10,000 to develop a pilot demonstration program on deer contraception.

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 9 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. **The recent decision of the Northern Virginia Regional Park Authority to drop managed hunts on NVRPA sites requires that control of the deer populations on these sites be accomplished in other ways. The NVRPA preferred solution is expansion of the sharpshooter program to cover these areas despite the higher costs. Since the sharpshooter teams are currently provided by Fairfax County at its expense, an expanded sharpshooter program may require establishment of a cost-sharing formula to defray these added expenses.**

I. RECOMMENDATION

The recommendation provided below addresses only the first section of this chapter (Impacts of Deer in Fairfax County). Comments and recommendations addressing goose, coyote and wildlife-borne disease issues are found beginning on pages 218, 220 and 228, respectively.

1. EQAC strongly recommends additional staffing for the county's wildlife management program in the form of one full-time equivalent Assistant Wildlife Biologist to assist the County Wildlife Biologist in the Deer Management Program and specifically to be responsible 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 owners of small private (mostly residential) properties 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.

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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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VII-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 upsurgence. 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.

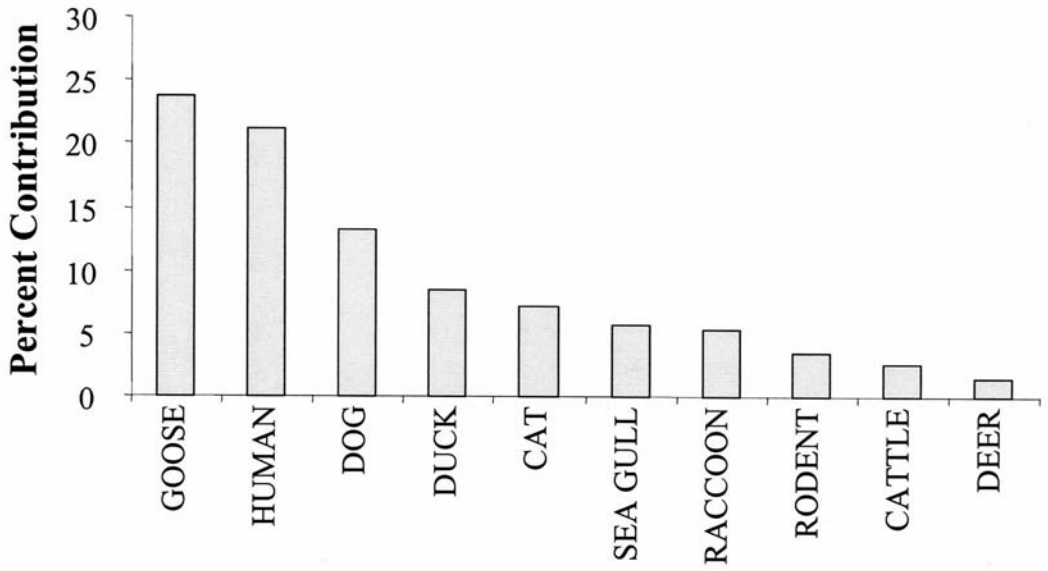
Several years ago, when the Evans Farm property in McLean was in the process of being rezoned for residential development, the farm pond, which was a prominent feature of the site, was extensively sampled to determine if it contained significant levels of pollution. It was known that a resident population 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 VII-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 VII-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 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 resident 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:

- Annandale
  - Northern Virginia Community College - population stabilization and nuisance abatement, six years.
  - Pinecrest Community - population stabilization and nuisance abatement, five years.
  - Pinecrest Golf Course - population stabilization and nuisance abatement, five years.

- Centreville
  - Franklin Farms - population stabilization, six years.
  - Westfields - population stabilization, five years.

- Fairfax County
  - Lake Barcroft - population stabilization and nuisance abatement, seven years.
  - Fairfax County Parks - population stabilization, seven years.
  - Copeland Pond - population stabilization and nuisance abatement, six years.

- Brook Hills - population stabilization and nuisance abatement, six years.
- Waters Edge - population stabilization and nuisance abatement, five years.

- Oakton
  - Fox Lake - population stabilization, five years.

- Reston
  - Reston Community - population stabilization, six, years.

- Vienna
  - Trinity School - population stabilization, six years.
  - Champion Lake - population stabilization, five 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 10 eggs from two nests addled under the County permit and 1403 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.

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 addresses only the second section of this chapter (Impacts of Geese in Fairfax County). Comments and recommendations addressing deer management, coyote and wildlife-borne disease issues are found beginning on pages 207, 220 and 228, respectively.

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:

   - Revitalization and supervision of the goose management 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.

   - Assessment of the role excessive goose populations play in destruction of marshland and wetland 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.

VII-3. COYOTES IN FAIRFAX COUNTY

A. OVERVIEW

There have recently been a growing number of reports of coyotes in the Washington, D.C. metropolitan area, particularly in the western portions. Coyotes have begun to invade habitats such as Rock Creek Park and there have been incidents 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 animals. Adult coyotes will sometimes prey on small deer fawns but do not attack adult deer because of their size. Coyotes can be of significant benefit in controlling goose populations, in that geese are an attractive food source. 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.

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 geese and a variety of rodents and other small varmints that coyotes provide.

H. COMMENT

There are no recommendations at this time except that the county's Wildlife Biologist should monitor the situation and keep the relevant county agencies and the public informed.

VII-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 VII-3-1). 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

A vaccine for Lyme disease was introduced in 1999 but was withdrawn from the market in 2001 due to adverse reactions to it. No new vaccines have been introduced since that time. 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 VII-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
July, 2004-June, 2005	20	Not Available
July, 2005-June, 2006	41*	Not Available

(Source: Fairfax County Department of Health)
*This figure is preliminary and might change slightly in the future.

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 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 VII-2-1 on page 212). 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 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; and
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. CONCLUSIONS

The upsurgence 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.

F. COMMENT

The comment provided below address only the fourth section of this chapter (Wildlife Borne Diseases of Concern in Fairfax County). Comments and recommendations addressing deer management, goose and coyote issues are found beginning on pages 207, 218 and 220, respectively.

1. The following are ongoing programs that are serving the county well and should receive continued active support:

   - The Stream Monitoring Program in which the Stream Protection Strategies Program of the DPWES will perform sample collection and field testing and the Health Department will perform laboratory testing and analysis functions. EQAC recommends that the Health Department continue and enhance its excellent public education programs.

   - 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 and tick borne diseases such as West Nile Virus and Lyme Disease.

   - Posting of advisories on the county Web site when polluted waters are identified.

ACKNOWLEDGMENTS

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Laura Suzuki, R.N., MPH, Fairfax County Health Department.

John Ruthinoski, Fairfax County Health Department.

Jorge Arias, PhD., Fairfax County Health Department.

LIST OF REFERENCES

Fairfax County Department of Health. Preventing Tick-borne Diseases in Virginia.

Fairfax County Department of Health. Rabies and Animal Bites: What you should know and what you should do.

Fairfax County Department of Health. West Nile Virus Control and Mosquito Management Program. Disease Carrying Insects Program.

WILDLIFE AND THE ENVIRONMENT IN FAIRFAX COUNTY: SUMMARY OF RECOMMENDATIONS

Impacts of Deer in Fairfax County

1. EQAC strongly recommends additional staffing for the county's wildlife management program in the form of one full-time equivalent Assistant Wildlife Biologist to assist the County Wildlife Biologist in the Deer Management Program and specifically to be responsible 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 owners of small private (mostly residential) properties 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.

Impacts of Geese in Fairfax County

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:

   - Revitalization and supervision of the goose management 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.

   - Assessment of the role excessive goose populations play in destruction of marshland and wetland habitats.

CHAPTER VIII

NOISE, LIGHT POLLUTION AND VISUAL POLLUTION

VIII-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.

One key element of determining noise pollution is the measured intensity of noise and how it impacts society as a whole. Noise is a 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 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 information given by the Metropolitan Washington Airports Authority, in 2005, more than 44.9 million passengers traveled through Ronald Reagan Washington National Airport (National) and Washington Dulles International Airport (Dulles) on more than 785,000 flights. During the months of October, November and December of 2005, over 181,000 flights served 10.6 million passengers. Many of these flights flew over neighborhoods throughout the metropolitan Washington region.

As noted by MWAA, 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. Typically, more than 60,000 total flights are conducted each month at these airports. 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.

Dulles sees approximately 40,000 flights each month. The number of daily operations varies significantly (for example, daily flight operations ranged from less than 1,000 to more than 1,600 during the last three months of 2005), 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, monitors aircraft and community noise around the clock at 32

locations in the Washington, D.C. Metropolitan Area. The monitoring equipment evaluates different sound events and separates those events likely to have been caused from aircraft from the remaining events, which are attributed to the community. The Metropolitan Washington Council of Governments' Committee on Noise Abatement and Aviation at National and Dulles Airports and the Airports Authority selected the monitoring sites from recommendations offered by the local governments.

Table VIII-1-1 contains summary information regarding noise impacts based on 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.

Table VIII-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	Last year change	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	-8.8
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**

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 VIII-1-1 appear to correlate with these observations.

In 2005, the Airports Authority's noise complaint centers at National and Dulles reported receiving 195 noise complaints from 69 different callers. National reported 48 complaints from 33 callers, while Dulles reported 147 complaints from 36 callers (with three of the callers filing 96 of the 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. There were 13 violations during the year 2005. Civil penalties were sought for 10 violations and three letters of warning were issued. A total of $16,000 was received from four penalties, with the remaining six cases pending as of the time of publication of MWAA's report.

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. The new north-south runway will be constructed first; the MWAA Web site indicates that completion of construction is anticipated in 2008. Construction dates for the fifth runway will be set in the future. There are many other projects under way at Dulles Airport, including:

- The addition of a new midfield concourse and related facilities.
- The construction of an "Automated People Mover" system to replace the existing Mobile Lounges with an underground rail system.
- The construction of a new air traffic control tower.

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 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.

MWAA has submitted the Part 150 study to the Federal Aviation Administration, and FAA's review of this document is continuing. MWAA is working with its consultants and with FAA to complete the review and receive the FAA's final determination on the study.

4. The Committee on Noise Abatement and Aviation at National and Dulles Airports

CONAANDA 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. CONAANDA provides a broad, balanced and integrated perspective on matters relating to airport and aircraft policies.

CONAANDA 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. Although this plan is currently under review by FAA, the MWAA has committed to move forward with several implementation strategies and will be working closely with CONAANDA on implementation. 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. The committee will also focus on the growing role general aviation plays in economic development and quality of life in the region.

CONAANDA will also continue to focus on developing implementation strategies for the recently completed Regional Helicopter System Plan.

Finally, it is anticipated that the Committee will recommend that the name be changed to more actually reflect what it does.

C. HIGHWAY NOISE

1. Background

Traffic in the Washington metropolitan area continues to grow, due to ever increasing residential development in and surrounding Fairfax County, especially to the west and north where adjacent counties are allowing almost uncontrolled residential development growth rates which are some of the largest in the country. These increasing rates of residential growth are being allowed with little or no consideration of their impacts on the already over used and limited transportation infrastructure serving the entire metropolitan region. 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.

The area's traffic ranks consistently as one of the most congested in the country. 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 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 05-06:

- Two sound barriers (Fairfax County portion) for U.S. Route 1 interchange improvements associated with the Woodrow Wilson Bridge project.

The following sound barriers have been approved for the following highway construction projects underway in FY 06-07:

- One sound barrier, with third party funding, associated with the West Ox Road widening between Penderbrook Road and Ox Trail.
- One replacement and enhanced sound barrier associated with Interstate 95 at Telegraph Road.

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. Such barriers may be approved by the board of supervisors in conjunction with the approval of a proffered rezoning for any zoning district, including P districts, or in conjunction with the approval of a special exception application, or by the Board of Zoning Appeals as a special permit use. Pursuant to Par. 1 of Sect. 8-919 or Par. 3F of Sect. 10-104 of the Zoning Ordinance, 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. In conjunction with the adoption of this Zoning Ordinance Amendment, the Planning Commission and board of supervisors requested staff to develop standardized noise study submission guidelines, which would be submitted to the Planning Commission for review and comment prior to implementation.

In response to this request, a noise study submission form and guidelines were developed. This form requires the applicant to provide information regarding the assumptions and data used in the noise study, the results of the analysis and a detailed description of the visual impacts of the noise barrier and its effectiveness in providing noise mitigation. Given that the cost of providing this information may be prohibitive for a noise barrier request on an individual residential lot, a second form has been developed which requires less information for noise barrier requests on individual residential properties.

Staff from the Department of Planning and Zoning, Department of Transportation and the Virginia Department of Transportation participated in the review and development of these guidelines. In addition, acoustical engineers from several firms that have submitted noise studies to the county in the past were invited to provide written comments. On two occasions participating consultants met with staff to discuss their issues and concerns regarding the proposed noise study submission guidelines. In addition, the Northern Virginia Building Industry Association and the National Association of Industrial and Office Properties were provided with the opportunity to comment on these guidelines.

On March 14, 2002, the Planning Commission's Environment Committee reviewed and endorsed the Noise Study Submission Guidelines. On March 20, 2002, the Planning Commission endorsed the guidelines.

On April 29, 2002, the board of supervisors accepted the proposed guidelines without change.

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 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.

2. Develop and distribute materials to educate the public on airport noise issues, including airport noise contours, noise-compatible planning and regulation, noise changes that may result from new construction and changes in flight frequencies and patterns and noise complaint procedures. Incorporate these educational materials into the county's overall environmental educational efforts.

VIII-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. 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, also known as veiling luminance, is caused by light sources that shine directly into ones 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, which is a serious driving hazard. 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.

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.

C. 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, these standards do not cover roadways that are under the jurisdiction of the Virginia Department of Transportation, and a number of these represent a continuing source of glare and light pollution. Also, installations existing at the time of adoption of the new ordinance that were noncompliant are allowed under state law to continue until such time as the fixture requires replacement.

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.**

D. 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 much worse.

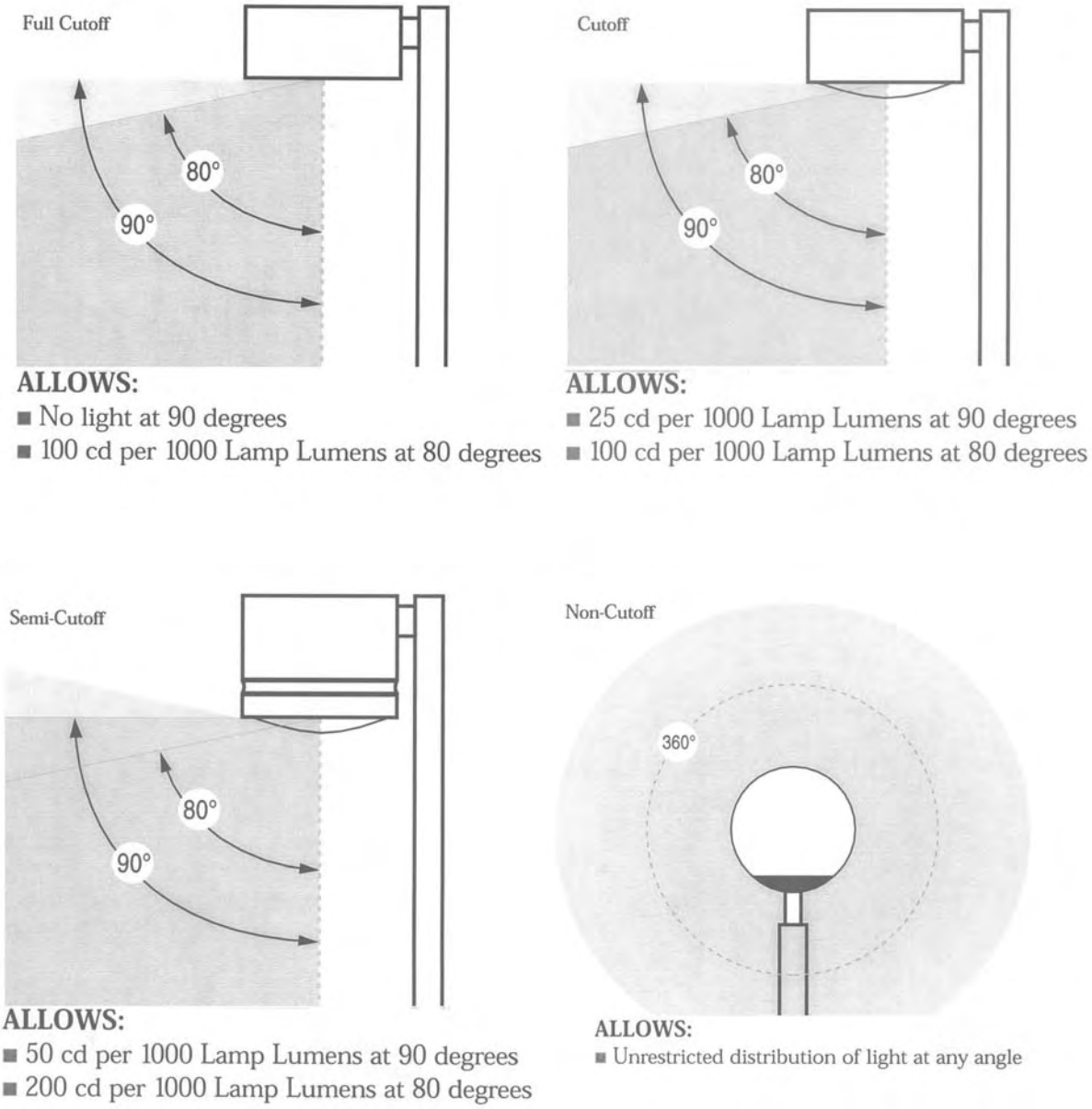
Because they cut down on glare, shielded fixtures not only are safer for drivers, but, according to experts (see references), actually make it easier for pedestrians and home owners to see their surroundings.

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 VIII-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 virtually 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.

Figure VIII-2-1
Effects of Cut-off and Non Cut-off Luminaires



(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.)

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.

- 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.

E. 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 were usually 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 restrictions through the provisions of 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.

In response to a recommendation in the EQAC 2003 Annual Report on the Environment the Fairfax County Park Authority commissioned a study of sports field lighting design and technology. EQAC believes this study has serious flaws in terms of the study objectives, the methodology and the evaluation criteria. The Park Authority has recently 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 EQAC 2004 Annual Report recommended that the Department of Planning and Zoning place high on its workplan for 2005 a modest revision of the Outdoor Lighting Ordinance to address the glare issue. Unfortunately, the issue was placed on the "Priority 2" list of the Adopted 2006 Zoning Ordinance Amendment Work Program and has therefore not been addressed.

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 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.

F. 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.

G. 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 small adjustments and fine-tuning are 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 is minimal with respect to light spillover, the glare from the fully exposed, 1,500 watt lamps on 70 foot poles facing a residential neighborhood was 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 showed no improvement in glare. 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.

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.

H. COMMENT/ONGOING CONCERN

1. EQAC recommends that the board of supervisors work with VDOT and Virginia elected officials to eliminate unnecessary roadway lighting and to achieve replacement of existing poorly designed fixtures (under the control of VDOT) on our roadways with full cut-off fixtures.

I. RECOMMENDATIONS

1. EQAC recommends that the board of supervisors direct the Department of Planning and Zoning to begin work on a revision to the Outdoor Lighting Ordinance consistent with EQAC's February 8, 2006 resolution on this matter (see Appendix A of this report) to address glare and several minor issues not later than January 2007 and to have such ordinance revisions ready for board of supervisors approval not later than July 2007.

2. EQAC recommends that the board of supervisors direct the Fairfax County Park Authority to plan and install no further athletic field lighting until the board of supervisors has approved revisions to the Outdoor Lighting Ordinance that address limitations on glare.

LIST OF REFERENCES

Fairfax County Department of Planning and Zoning, *A guide to Fairfax County's Outdoor Lighting Standards*, 16 pp.

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Douglas Paulin, *Full Cutoff Lighting: The Benefits*, (corrected version), Illuminating Engineering Society of North America Web site, **www.iesna.org**.

Shaflik, Carl, *Environmental Effects of Roadway Lighting,* Information Sheet Number 125, International Dark-Sky Association, Tucson, Arizona, August 1997.

Some Lighting Myths, Information Sheet Number 42, International Dark-Sky Association, Tucson, Arizona, January 1991.

Fairfax County, Virginia, *Policy Plan: The Countywide Policy Element of the Comprehensive Plan*, 2000 Edition.

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/**

National Electrical Manufacturers Association Web site, **www.nema.org/**
(Particularly see their White Paper on Outdoor Lighting Code Issues.)

Virginia Outdoor Lighting Taskforce Web site, **www.volt.org/**.

Quality Outdoor Lighting Web site, **www.qualityoutdoorlighting.com/**.

VIII-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. TELECOMMUNIATION 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 real

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 residents 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 resident 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. RECOMMENDATIONS

1. EQAC strongly 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 issued as a "Letter to Industry" in much the same manner as is done by the Department of Public Works and Environmental Services. 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.

2. The Fairfax County Sign Task Force made several recommendations. EQAC strongly urges the board of supervisors to again consider the Task Force's report and either implement its findings or reconstitute the Task Force to find alternatives that are more palatable to the board and residents of the county. (See Addendum 2 for specific items that should be addressed.)

3. The Environmental Quality Advisory Council supports the general premise underpinning each of the Fairfax County Sign Task Force's recommendations (see Visual Pollution Recommendation #2 and the related Addendum 2), but believes that before the county seeks major amendments to the Code or introduces new programs of its own, a study should be performed to determine the impact on existing programs, staffing and budget, and that a cost benefit analysis determine the extent to which the proposed amendments or additions would contribute to reducing visual pollution in a cost effective manner, having due regard for the possibilities of cost recovery through the rigorous imposition of civil penalties.

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.

ADDENDUM 2

The Fairfax County Sign Task Force made a number of specific recommendations that EQAC strongly endorses, as follows:

- After holding a public hearing, the board, pursuant to Virginia Code §33.1-375, should enter into an Agreement with the Commissioner of VDOT to enforce Virginia Code § 33.1-373. The Agreement would provide for sharing civil penalties collected after the county's costs have been recovered. [The Task Force provided a draft Agreement for the board to consider.]

- The county should fully support the county Sheriff's program of using inmates for removal of roadside litter, including removal of signs illegally posted in a right-of-way.

- The county should implement a pilot project of approximately six months to determine whether additional resources are needed, and if so, develop a list of alternatives for further evaluation and ranking in terms of cost benefit analysis for the board to use as it decides whether to expand the Agreement or move in a different direction.

- The county should conduct an information and public outreach program regarding restrictions of signs in the public rights-of-way and any new county program to prosecute sign violations.

- The county executive should send letters to public entities within the county advising them of illegal signs and outcomes of posting same.

- The board should invite VDOT to consider implementing in Fairfax County additional possible deterrents to minimize illegal signs in the rights-of-way.

- As part of its Legislative Program, the board should seek an amendment to the Code of Virginia that would declare all signs illegally posted in a right-of-way to be abandoned and, therefore, illicit trash that may be removed by anyone.

- If the above is not successful or possible, then the alternative is to seek an Amendment to the Code of Virginia that would permit individuals, as opposed to organized groups, to participate in the Adopt-A-Highway program to remove or cleanup illegal signs as duly authorized representatives of the Commissioner.

- The county should seek an Amendment to the Code of Virginia placing reasonable limitations on political campaign signs in the right-of-way. The County should offer recommendations for limits on the number, minimum distance between individual signs, and the time frame for posting and then removing the signs.

NOISE, LIGHT POLLUTION AND VISUAL POLLUTION: SUMMARY OF RECOMMENDATIONS

Noise

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.

2. Develop and distribute materials to educate the public on airport noise issues, including airport noise contours, noise-compatible planning and regulation, noise changes that may result from new construction and changes in flight frequencies and patterns and noise complaint procedures. Incorporate these educational materials into the county's overall environmental educational efforts.

Light Pollution

1. EQAC recommends that the board of supervisors direct the Department of Planning and Zoning to begin work on a revision to the Outdoor Lighting Ordinance consistent with EQAC's February 8, 2006 resolution on this matter (see Appendix A of this report) to address glare and several minor issues not later than January 2007 and to have such ordinance revisions ready for board of supervisors approval not later than July 2007.

2. EQAC recommends that the board of supervisors direct the Fairfax County Park Authority to plan and install no further athletic field lighting until the board of supervisors has approved revisions to the Outdoor Lighting Ordinance that address limitations on glare.

Visual Pollution

1. EQAC strongly 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 issued as a "Letter to Industry" in much the same manner as is done by the Department of Public Works and Environmental Services. When an illegally posted sign is observed by an inspector, or reported by a resident, such a letter, containing the text of the ordinance, could be sent to the offending party as a means of strongly discouraging continuance or repetition of the violation.

2. The Fairfax County Sign Task Force made several recommendations. EQAC strongly urges the board of supervisors to again consider the Task Force's report and either implement its findings or reconstitute the Task Force to find alternatives that are more palatable to the board and residents of the county. (See Addendum 2 for specific items that should be addressed.)

3. The Environmental Quality Advisory Council supports the general premise underpinning each of the Fairfax County Sign Task Force's recommendations (see Visual Pollution Recommendation #2 and the related Addendum 2), but believes that before the county seeks major amendments to the Code or introduces new programs of its own, a study should be performed to determine the impact on existing programs, staffing and budget, and that a cost benefit analysis determine the extent to which the proposed amendments or additions would contribute to reducing visual pollution in a cost effective manner, having due regard for the possibilities of cost recovery through the rigorous imposition of civil penalties.

APPENDIX A

EQAC RESOLUTIONS AND POSITIONS DECEMBER 2005 THROUGH NOVEMBER 2006

CONTENTS

County of Fairfax, Virginia

MEMORANDUM

DATE: January 18, 2006

TO: Board of Supervisors
Planning Commission
Engineering Standards Review Committee
Jimmie D. Jenkins, Director, Department of Public Works and Environmental Services

FROM: Stella Koch, Chairman Stella M. Koch
Environmental Quality Advisory Council

SUBJECT: Proposed amendment language regarding perennial stream reclassifications

You have recently received an EQAC resolution regarding amendments to the Chesapeake Bay Preservation Ordinance proposed by the county staff that relate to reclassification of perennial streams to intermittent. The county staff has also proposed amendments to the Public Facilities Manual that relate to such reclassifications. The county staff has briefed EQAC on these proposed amendments and joined us on several occasions to discuss the various details of these proposals. EQAC is in general agreement with the measures proposed by the staff, since they address major concerns identified by EQAC during the initial two years experience with the 2003 ordinance revisions. However, the initial drafts developed by the staff had not addressed certain issues of perenniality and how it should be measured and determined. During the discussions with the staff that led to the EQAC resolution of November 9, 2005, these issues were clarified and substantial agreement reached on suitable measurement methodology. EQAC has since developed additional proposed amendment language that would codify these areas in both the ordinance and the PFM and would extend the revisions developed by the county staff. The EQAC proposed amendments were approved by unanimous vote of the council at its January 11, 2006, meeting and are appended below. The two essential features of these amendments are: 1) determinations are made at the bottom of the sediment bed or of dynamic pools within the sediment bed; and 2) the final determination (or verification), after the required studies are submitted by the owner/developer, will be made by the county staff. This latter requirement will have negligible impact on staff time given what is anticipated to be an exceptionally low frequency of such proposed reclassifications, but will serve to assure consistency of methodology and provide a high degree of reassurance to the public.

SMK:FBC:nhk

Environmental Quality Advisory Council (EQAC)
c/o Department of Planning and Zoning
Planning Division
12055 Government Center Parkway, Suite730
Fairfax, Virginia 22035-5509
Phone 703-324-1380
Fax 703-324-3056
www.fairfaxcounty.gov/eqac/

Attachments:

1. EQAC's November 9, 2005 resolution.
2. County staff October 7, 2005 Chesapeake Bay Preservation Ordinance draft amendment language.
3. EQAC's January 11, 2006 Chesapeake Bay Preservation Ordinance additional amendment language.
4. County staff October 7, 2005, PFM draft amendment language with EQAC modifications and additions highlighted

cc: Anthony H. Griffin, County Executive
Robert A. Stalzer, Deputy County Executive
Kambiz Agazi, Fairfax County Environmental Coordinator
James Patteson, Director, Land Development Services, DPWES
Michelle Brickner, Assistant Director, Land Development Services, DPWES
Environmental Quality Advisory Council file: January, 2006

Environmental Quality Advisory Council

Resolution regarding
Reclassification of Perennial Streams

November 9, 2005

Whereas, practically all streams in Fairfax County have streambeds consisting of a sediment layer comprised of particles ranging in size from silt to coarse gravel and small stones; and

Whereas, these sedimentary streambeds may range from an inch or two up to several feet in thickness, except for those few short stretches where the sediment layer may have been scoured down to a stone bench or the channel armoring layer; and

Whereas, scientific research and engineering studies have shown conclusively that, in addition to the flow of water above the bed, there is continuous flow through these sedimentary streambed layers; and

Whereas, many of these studies have shown that such "through-the-bed flow" persists even when the "above-the-bed flow" is diminished to the point of absence during seasonally dry periods or during drought conditions; and

Whereas, such sediment layers form an important habitat for many invertebrate species and insect larvae and play a much more important role chemically than the "above surface" waters; and

Whereas, it has become apparent that the mere absence of "above-the-bed" water for some portion of the length a stream often gives an erroneous and misleading result if relied upon for classification or reclassification of the stream; and

Whereas, if a stream is perennial above a certain reach and perennial below that same reach, it is a logical impossibility that the reach in question should be deemed intermittent; and

Whereas, in addition to measurements taken in the particular stream reach being considered for reclassification it is essential to check in both the upstream and downstream directions to determine the presence of "above-the-bed flow", the presence of "through-the-bed flow", and the flow rates; and

Whereas, federal agencies such as the U.S, Geological Survey, Bureau of Land Management, Corps of Engineers, and Environmental Protection Agency, as well as numerous state and local agencies, use a variety of proven techniques, such as dye injection tests, isotope tests, bore holes, and piezometry (a testing procedure) to determine flow through sedimentary streambeds; and

Whereas, Fairfax County has developed a generally excellent protocol, which utilizes 26 factors in order to determine an initial classification for a stream, but which contains no criterion for evaluation of "through-the-bed flow" in the streambed; and

Whereas, the Chesapeake Bay Preservation Ordinance (CBPO) and Public Facilities Manual (PFM) presently rely only on a visual observation of absence of "above-the-bed flow" as the basis for changing the stream classification from perennial to intermittent; and

Whereas, the County staff has drafted language that would correct this deficiency in the procedures for reclassification of streams; and

Whereas, the County staff has proposed detailed requirements for notifying nearby neighbors of any proposed reclassification study; now therefore

Be it resolved, that the CBPO and the PFM be modified to include a provision that reclassification of a stream or any portion thereof, where "above-the-bed flow" is not apparent, shall require determination by County staff of the presence or absence of dynamic pools of water in the sedimentary bed, or the presence of water at the true channel bottom which is located below the moveable bed load at the top of the channel armoring layer, and where either determination finds water present, that shall be regarded as conclusive proof of perenniality; and

Be it further resolved, that the above determination may include, if required, physical tests such as dye injection, isotope migration, bore holes, piezometry or other standard methods to determine "through-the-bed flow/flow rate;" and

Be it further resolved, that any stream reach being considered for reclassification shall have the "above-the-bed flows," "through-the-bed flows," presence of dynamic pools, and presence of water at channel bottom determined upstream to the beginning of perenniality as shown on the adopted maps and downstream for 150 feet from the reach in question; and

Be it finally resolved, that the notification of nearby neighbors of the proposed reclassification, as has been proposed by the County staff, be incorporated in the CBPO and the PFM, as appropriate.

Proposed Amendments to Chapter 118 (Chesapeake Bay Preservation Ordinance)
of
The Code of the County of Fairfax, Virginia

Amend the Chesapeake Bay Preservation Ordinance, Section 118-1-6 (Definitions.), by revising Paragraph (dd) to read as follows:

(dd) "Water body with perennial flow" means a body of water flowing continuously in a natural or man-made channel year-round under normal or wetter than normal hydrologic conditions ~~, except during periods of drought~~. The term "water body with perennial flow" includes perennial streams, estuaries, and tidal embayments. A perennial stream means any stream that is both perennial and so depicted on the map of Chesapeake Bay Preservation Areas adopted by the Board of Supervisors pursuant to Section 118-1-9(a). Streams identified as perennial on the adopted map are based on field studies conducted by the Department of Public Works and Environmental Services. Lakes and ponds that form the source of a perennial stream, or through which the perennial stream flows, are a part of the perennial stream. The width of a perennial stream may be measured from top-of-bank to top-of-bank or at the Ordinary High Water Mark (OHWM) as defined by 33 CFR Part 328.3(e). The aerial extent of a pond or lake is measured at the OHWM. Generally, the water table is located above the streambed for most of the year and groundwater is the primary source for stream flow. In the absence of pollution or other manmade disturbances, a perennial stream is capable of supporting aquatic life.

Amend the Chesapeake Bay Preservation Ordinance, Section 118-1-9 (Chesapeake Bay Preservation Area Boundaries.), by revising Paragraph (d) to read as follows:

(d) Any landowner or agent of the landowner may submit a site-specific determination of the location of RPA boundaries (RPA boundary delineation study) certified by a professional engineer, land surveyor, landscape architect, soil scientist, or wetland delineator certified or licensed to practice in the Commonwealth of Virginia for review and approval by the Director. For land in agricultural use, such site-specific determination of the location of RPA boundaries may be made by an agricultural water quality specialist designated by the Northern Virginia Soil and Water Conservation District. Such site-specific determinations of RPA boundaries shall be performed in accordance with the requirements of this Chapter and the Public Facilities Manual.

(1) Any person who submits an RPA boundary delineation study for the purpose of reclassifying a water body from perennial to intermittent shall submit written proof of notification of all owners of property abutting and immediately across the street from the parcel containing the water body being studied and one (1) homeowner association or civic association within the immediate area as approved by the Department of Public Works and Environmental Services. Such notice shall include notice to owners of properties abutting and immediately across the street which lie in an adjoining county or municipality. This notification must be to a minimum of ten (10) property owners other than the owner of the parcel for which the study is prepared. If there are fewer than ten (10) different owners of property abutting and immediately across the street from the subject property, then additional notices shall be sent to other property owners in the immediate vicinity so that notices are sent to different owners of not less than ten (10) properties. Notice shall be sent to the last known address of the owner(s) as shown in the current Real Estate Assessment files. Notice to homeowner associations or civic associations shall be sent to the registered office address kept on file with the State Corporation Commission. All written notice shall be sent by

certified mail, return receipt requested.

(2) The written notification required in Paragraph (d)(1) above shall include the following information:

(i) The tax map reference number;

(ii) The street address of the parcel;

(iii) The plan name and County identification number;

(iv) The address and telephone number of the County Office where a copy of the study may be reviewed;

(v) The name, address, and telephone number of a representative of the applicant; and

(vi) A reproduction of the portion of the map of Chesapeake Bay Preservation Areas adopted by the Board of Supervisors showing the segment of the stream proposed for reclassification and surrounding properties on an 8½ inch by 11 inch sheet.

(3) The written notification required in Paragraph (d)(1) above shall state that:

(i) A request for a reclassification of a water body depicted on the County's map of Chesapeake Bay Preservation Areas from perennial to intermittent has been submitted to the Department of Public Works and Environmental Services;

(ii) Approval of the study will result in the removal of the Resource Protection Area (RPA) designation along the water body being studied;

(iii) RPAs are the environmentally sensitive lands along water bodies with perennial flow and are protected from most development;

(iv) Persons wishing to be notified of the approval of the study should submit a written request to that effect to the County Office identified in the notice;

(v) The study is subject to approval after the expiration of thirty (30) days after the postmark date of the notice unless releases are executed by all property owners required to be notified; and

(vi) If releases are executed by all property owners required to be notified, the study may be approved sooner than thirty (30) days after the postmark date of the notice.

(4) The person submitting the study shall send a copy of the written notification letter to the Board Member in whose district the subdivision is located and the Chairman of the Board on the same date the abutting property owners specified in Paragraph (d)(1) above are notified.

(5) No study shall be approved within thirty (30) days following the postmark date on the white receipts for the certified mailings unless releases are executed by all property owners required to be notified. If releases are executed by all property owners, the study may be approved sooner than thirty (30) days after the postmark date on the white receipts for the certified mailings. The original executed releases shall be submitted to the Director on a standard form available from the Director.

You will recall the resolution EQAC recently passed regarding testing of the perenniality of streams proposed for reclassification to intermittent. In the "be it resolved" paragraphs certain principles were enumerated. However, it now seems appropriate to recommend specific language incorporating those principles for insertion as an amendment to the Chesapeake Bay Preservation Ordinance (Chapter 118) beyond those amendments recently proposed by the County Staff. This proposed amendment would codify a well-defined set of procedures to accomplish this determination as indicated below.

Environmental Quality Advisory Council Proposed Additional Amendment Language for CBPO.

Amend the Chesapeake Bay Preservation Ordinance, Section 118-1-9 by inserting the following new language as Paragraph (c) and renumbering Paragraphs (c) through (e) as contained in the Count Staff proposed amendment to Paragraphs (d) through (f).

(c) Any water body, or portion thereof, shown as perennial on the adopted maps, for which reclassification to intermittent is proposed because of the lack of apparent "above-the- sediment-bed" flow shall require determination by the County staff of 1) the presence or absence of dynamic pools of water in the sediment bed, 2) the presence or absence of water at the true channel bottom, which is below the moveable bed load at the top of the channel armoring layer, and where either determination finds water present that shall be regarded as conclusive proof of perenniality.

(1) The above determination may include, if required, physical tests such as dye injection, isotope migration, bore holes, piezometry or other standard methods to evaluate "through-the-bed" flow/flow rate.

(2) Any stream proposed for reclassification shall have the "above-the-sediment-bed" flows, "through the-sediment-bed" flows, presence of dynamic pools, and presence of water at the true channel bottom determined upstream to the beginning of perenniality as shown on the adopted maps and downstream for 150 feet below the stream reach in question.

(3) All owners of property abutting and immediately across the street from the parcel(s) containing the water body being studied shall be notified in accordance with 118-1-9 (d) (1) below.

Renumber old Paragraph (c) to new Paragraph (d).

Renumber old Paragraph (d) to new Paragraph (e).

Renumber old Paragraph (e) to new Paragraph (f).

PROPOSED
AMENDMENT TO THE PUBLIC FACILITIES MANUAL
OF THE COUNTY OF FAIRFAX, VIRGINIA

Amend PFM 6-1700 (POLICY ON WHAT MAY BE DONE IN CHESAPEAKE BAY PRESERVATION AREAS) Section 6-1701 (General Information) to read as follows:

6-1701 General Information

6-1701.1 Certain areas of the County have been designated Chesapeake Bay Preservation Areas (CBPAs) and divided into Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) that are subject to the criteria and requirements contained in Chapter 118 (Chesapeake Bay Preservation Ordinance) of the Code. RPAs are protected from most development because, left intact, they function to improve and protect water quality. RMAs are regulated to protect RPAs and water resources from degradation resulting from development and land disturbing activity.

6-1701.2 A map of CBPAs has been adopted by the Board. Where RPA and RMA boundaries on the adopted map differ from boundaries as determined on a site-specific basis from the text of Chapter 118 (Chesapeake Bay Preservation Ordinance) of the Code, the text shall govern.

6-1701.3 The site-specific boundaries of the RPA shall be delineated on all preliminary plans, site plans, subdivision plans, grading plans, public improvement plans, record plats, and all other plans of development in accordance with Chapter 118 (Chesapeake Bay Preservation Ordinance) of the Code and subject to the approval of the Director.

6-1701.4 Chapter 118 (Chesapeake Bay Preservation Ordinance) of the Code requires that a~~A~~ reliable, site-specific evaluation shall be conducted to determine whether water bodies on or adjacent to development sites have perennial flow and that RPA boundaries shall be adjusted, as deemed necessary by the Director, on the site, based on this evaluation of the site. ~~Site-specific~~ The evaluations performed by the Department of Public Works and Environmental Services (DPWES) that are the basis for the perennial streams depicted on the adopted map of CBPAs satisfy this requirement. Water bodies identified as perennial on the adopted map of CBPAs are presumed to be perennial and may only be reclassified as intermittent based on additional studies performed ~~It is the responsibility of the developer to have a site-specific evaluation performed for those sites where an evaluation has not been performed by DPWES. The site-specific evaluation shall be conducted~~ in accordance with this Article and Chapter 118 (Chesapeake Bay Preservation Ordinance) of the Code.

Amend PFM 6-1700 (POLICY ON WHAT MAY BE DONE IN CHESAPEAKE BAY PRESERVATION AREAS) Section 6-1704 (Guidelines for Determining Locations of Resource Protection Areas and Identifying Water Bodies with Perennial Flow) to read as follows:

6-1704 Guidelines for Determining Locations of Resource Protection Areas and Identifying Water Bodies with Perennial Flow.

6-1704.1 ~~Where required,~~ Resource Protection Area (RPA) boundary delineation studies and the identification of water bodies with perennial flow shall be performed by the methods described herein or other acceptable methods as determined by the Director.

6-1704.2 The RPA shall include any land characterized by one or more of the following features:

6-1704.2A A tidal wetland;

6-1704.2B A tidal shore;

6-1704.2C A water body with perennial flow;

6-1704.2D A nontidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow;

6-1704.2E A buffer area as follows:

6-1704.2F(1) Any land within a major floodplain ["Major floodplain" means those land areas in and adjacent to streams and watercourses subject to continuous or periodic inundation from flood events with a one (1) percent chance of occurrence in any given year (i.e., the 100-year flood frequency event) and having a drainage area equal to or greater than three hundred and sixty (360) acres.];

6-1704.2F(2) Any land within 100 feet of a feature listed in § 6-1704.2A through § 6-1704.2D. The full buffer area shall be designated as the landward component of the RPA not withstanding the presence of permitted uses, encroachments, and permitted vegetation clearing.

6-1704.3 Designation of the RPA components listed in § 6-1704.2A through § 6-1704.2D shall not be subject to modification unless based on reliable, site-specific information.

6-1704.4 Water bodies with perennial flow shall be identified using a scientifically valid system of in-field indicators of perennial flow as determined by the Director. Acceptable methods include but are not limited to the perennial stream mapping protocol developed by the Department of Public Works and Environmental Services and methods determined by the Chesapeake Bay Local Assistance Department to be scientifically valid that are acceptable to the Director.

6-1704.4A Water bodies identified as perennial on the adopted map of Chesapeake Bay Preservation Areas are based on field studies conducted by the Department of Public Works and Environmental Services using established protocols and shall only be ~~reclassified~~ proposed for reclassification as intermittent based on observational data of the absence of stream flow during normal or wetter than normal hydrologic conditions ~~nondrought periods~~.

6-1704.4B The weekly drought assessment under the U.S. Drought Monitor (NOAA et al) shall be used to determine the general hydrologic conditions at the time observational data is collected. Observational data of the absence of stream flow collected during a period when the assessment under the U.S. Drought Monitor is D0 (abnormally dry) or drier will not be accepted as definitive proof that a stream is intermittent.

6-1704.4C Water bodies not identified as perennial on the adopted map of Chesapeake Bay Preservation Areas may only be reclassified as perennial in conjunction with an amendment to the map by the Board of Supervisors.[1]

6-1704.4D ~~Observations~~ Observational studies of stream flow shall be made in accordance with the following:

6-1704.4D(1) Unless modified by the Director, observations of stream flow or lack thereof shall be made at intervals of 50 feet or less along the stream channel beginning a minimum of 150 feet downstream from the property line to a point 150 feet above the terminus of the perennial stream as depicted on the adopted map of Chesapeake Bay Preservation Areas, at all control sections within the study reach, and at the nearest control section upstream and downstream from the property boundary. A control section is a culvert or other section with a hard bottom where flow would be readily visible.

6-1704.4D(2) Two sets of observations at the above locations must be made a minimum of seven but no longer than thirty days apart.

6-1704.4D(3) Observations shall be made at the true channel bottom which is located below the movable bed load and channel armoring materials.

6-1704.4D(4) The Department of Public Works and Environmental Services (DPWES) shall be advised prior to or within three days of completion of the first set of observations of the property owner's intent to submit ~~an RPA boundary delineation study~~ a proposal to reclassify to reclassify the stream from perennial to intermittent.[2]

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[1] Any request to re-evaluate a stream segment for possible reclassification from intermittent to perennial should be made through the Board member in whose district the stream segment is located. The Department of Public Works and Environmental Services will re-evaluate the stream segment and provide a recommendation to the Board member.

[2] DPWES will perform a field review as part of the evaluation of the reclassification study. DPWES will coordinate the field review with the 2nd visit to the site by the agent of the landowner whenever possible. Where the channel is not completely dry and there are visible pools of water that do not appear to be moving, dye tracing and tracing techniques in

6-1704.4E Any water body, or portion thereof, shown as perennial on the adopted maps, for which reclassification to intermittent is proposed because of the lack of apparent "above-the-sediment-bed" flow shall require determination by the County staff of 1) the presence or absence of dynamic pools of water in the sediment bed, 2) the presence or absence of water at the true channel bottom, which is below the moveable bed load at the top of the channel armoring layer, and where either determination finds water present that shall be regarded as conclusive proof of perenniality.

6-1704.4E(1) The above determination may include, if required, physical tests such as dye injection, isotope migration, bole holes, piezometry or other standard methods to evaluate "through-the-bed" flow/flow rate.

6-1704.4E(2) Any stream proposed for reclassification shall have the "above-the-sediment-bed" flows, "through the-sediment-bed" flows, presence of dynamic pools, and presence of water at the true channel bottom determined upstream 150 feet beyond the beginning of perenniality as shown on the adopted maps and downstream for 150 feet below the stream reach in question.

6-1704.4E(3) At the time of submission of the observational study and proposal for reclassification all owners of property abutting and immediately across the street from the parcel(s) containing the water body being studied shall be notified in accordance with 118-1-9 (e) (1).

6-1704.5 Wetland determinations shall be performed using methods specified by the United States Army Corps of Engineers (USACE).

6-1704.6 RPA boundary delineation studies shall be sealed by a professional engineer, land surveyor, landscape architect, soil scientist, or wetland delineator certified or licensed to practice in the Commonwealth of Virginia. Any work performed by other firms or individuals not under the responsible charge of the licensed professional sealing the study shall be identified and sealed by that individual as appropriate.

6-1704.7 RPA boundary delineation studies shall be submitted on standard-size sheets of 24" x 36" or the metric equivalent at a scale of 1"=50' (1:500) or larger meeting the requirements of § 2-0201.2.

6-1704.8 RPA boundary delineation studies to determine site-specific RPA boundaries shall include the following:

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accordance with ASTM or USGS methods, or other methods and techniques may be utilized by DPWES to determine if water is flowing from pool to pool.

6-1704.8A Cover sheet with project name, County plan identification number, vicinity map, tax map reference, and fee computation;

6-1704.8B A narrative describing how the RPA boundary was established including a discussion of which components listed in § 6-1704.2 determine the RPA boundary and any wetlands shown on the plan that were determined not to be a component of the RPA (i.e. did not meet the requirement of 6-1704.2D).

6-1704.8C Plan sheet(s) with 2 foot (0.5m) contour interval topography showing each individual component of the RPA overlain to create the final RPA boundary, the RPA boundary from the adopted Chesapeake Bay Preservation Area maps, locations of horizontal and vertical control points, and locations of points and transects used in the wetland determination. Field run and aerial ~~T~~topography shall be correlated to a USGS or County benchmark(s), based on NGVD29, which shall be referenced in the plan. Plan sheets shall include a north arrow in accordance with § 2-0212.3.

6-1704.8D Standard USACE data forms used in the wetland determination and any relevant correspondence from the USACE.

~~6-1704.8E A description of the methodology and data collected, including standard data sheets, used to identify water bodies with perennial flow. This is only required when the water body is not identified as perennial on the adopted map of Chesapeake Bay Preservation Areas or when the water body is being reclassified as intermittent.~~

6-1704.8E~~F~~ Source of the major floodplain boundary.

6-1704.9 RPA boundary delineation studies and proposals to reclassify streams from perennial to intermittent shall include the following:

6-1704.9A Cover sheet with project name, County plan identification number, vicinity map, tax map reference, and fee computation;

6-1704.9B A narrative describing how, when, and where the observations were made, the weather conditions at the time the observations were made, and the study's final conclusion on whether the stream is perennial or intermittent.

6-1704.9C Plan sheet(s) with 2 foot (0.5m) or 5 foot (1.25 m) contour interval topography showing the RPA boundary from the adopted Chesapeake Bay Preservation Area maps, locations of points where observations were made with a key to the photographic documentation provided, the point at which the stream transitions from perennial to intermittent and the revised RPA boundary. Field run and aerial topography shall be correlated to a USGS or County benchmark(s), based on NGVD29, which shall be referenced in the plan. Alternatively, property and topographic information from the County's Geographic Information System may be used. Plan sheets shall include a north arrow in accordance with § 2-0212.3.

6-1704.9E Meteorologic data. Daily precipitation, max. & min. temperature, and cloud cover from the nearest NWS weather station for a period of three weeks preceding the date that the first set of observations were made through the date when the second set of observations were made. The weekly U.S. Drought Monitor classification for a period of two months preceding the date that the first set of observations were made through the date when the second set of observations were made. If available at the time of plan submission, the weekly U.S. Drought Monitor classification for a period of one month following the date that the second set of observations were made. The County may use meteorologic data from local rain gage stations closer to the site in evaluating the reclassification request.

6-1704.8F Observations of streamflow. The date, time, name of the observer, weather conditions at the time of observation, and photographs looking upstream and downstream documenting each observation. Photographs shall capture the various stream features (pools, riffles, runs) along the stream.

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Resolution Proposing Amendment of the Outdoor Lighting Ordinance

February 8, 2006

Whereas, in order to meet the need for increased hours of usability of our sports and athletic fields it has been found necessary to provide lights for these fields; and

Whereas, our generally excellent Outdoor Lighting Ordinance adopted in July 2003 did not incorporate specific provisions for limitations on glare and "light spillover" from such lights into adjacent properties; and

Whereas, such "light pollution" has previously been cited by the Environmental Quality Advisory Council (EQAC) in its annual reports as a major source of environmental degradation, especially where it affects residential neighborhoods; and

Whereas, adjacent jurisdictions (notably Loudoun County and Montgomery County) have in place specific restrictions, particularly with respect to glare, that are quite effective; and

Whereas, similar provisions are now essential in Fairfax County to promote peace and harmony between our parks and schools and their surrounding residential neighborhoods; now therefore

Be it resolved, that the Environmental Quality Advisory Council strongly recommends amendment of the Outdoor Lighting Ordinance (Code of Fairfax County, Article 14-900 et seq) to incorporate specific provisions to limit both glare and light spillover from sports and athletic facilities onto adjacent properties and proposes the attached amendment language to accomplish this; and

Be it further resolved, that the Board of Supervisors should act without delay to instruct the Department of Planning and Zoning to give this amendment high priority in its annual work plan.

EQAC Proposed Amendments to the Outdoor Lighting Ordinance

The purpose of this amendment is to make the revised glare provisions applicable to playing fields/courts of all sizes.

14-904 Outdoor Recreation/Sports Facility Lighting Requirements

When an outdoor recreation/sports facility has illuminated playing fields/courts that, individually or cumulatively, exceed 10,000 square feet in area, and/or associated light poles that exceed 20 feet in height, the playing fields/courts shall be subject to the provisions of this Section. Other components of such facilities, to include, but not limited to, parking lots, administrative offices, restrooms, ticket sales, concession stands and bleachers or other spectator viewing areas, shall not be subject to this section, but shall be subject to Sect. 902 above.

An outdoor recreation/sports facility that has illuminated playing fields/courts, either individually or cumulatively, that are 10,000 square feet or less in area and/or contain associated light poles 20 feet or less in height, shall ~~not~~ be subject only to Paragraph 4 of this Section. Other components of such facilities, to include, but not limited to, parking lots, administrative offices, restrooms, ticket sales, concession stands and bleachers or other spectator viewing areas, shall not be subject to this section, but shall be subject to Sect. 902 above.

For the purposes of this Section, the perimeter area defined in Par. 2B below shall be included in the area of the playing field/court.

The following amendment adds language to eliminate glare and light spillover into adjacent neighborhoods.

14-904 (4)

All playing field/court lighting fixtures shall use full cut-off or directionally shielded lighting fixtures, aimed toward the playing field/court and shielded in directions away from and beyond the playing field/court so as to minimize glare and light trespass onto adjacent properties.

A. All fixtures shall be of a design or have supplementary shielding such that the lamp or light bulb, including any reflector within which it is mounted, shall not be directly visible at any point 5 feet or higher above the property boundary.

B. Illumination of the ground surface at and beyond the property line shall be limited to 0.5 foot-candles measured with the sensor positioned horizontally at grade level.

Environmental Quality Advisory Council

Resolution to Address Residential Infill Development

March 8, 2006

WHEREAS, Fairfax County is approaching build-out, meaning that most land that is planned for residential development has been developed; and

WHEREAS, Residential development in existing neighborhoods is therefore being realized as infill development, and;

WHEREAS, Unmanaged infill development can have detrimental effects on a neighborhood, including loss of trees and habitat due to new construction as well as increased impervious surfaces that result in increased stormwater runoff and related water resource degradation, and;

WHEREAS, The Board of Supervisors' plan for Environmental Excellence in Fairfax County identifies infill development as an issue and specifically calls out the following action:

> *Pursue state enabling legislation to ensure adequate infrastructure is in place for new developments and to provide more flexibility to ensure harmonious and compatible development. Work toward ensuring that new and renovated homes are compatible with established neighborhoods.* and;

WHEREAS, Arlington County recently adopted a Zoning Coverage Amendment (attached) that strengthens its ability to manage infill development by limiting the percentage of a lot that may be redeveloped based on the zoning district, and;

WHEREAS, The county's Zoning Ordinance Amendment Work Program for 2005 identified specific actions that included 23 "Priority 1" Actions and 84 "Priority 2" Actions, of which two Priority 2 actions address restrictions that would improve the county's ability to regulate and manage infill development, in particular items:

31. *Consider incorporating methods, such as maximum lot coverage or floor area ratio requirements, that address compatibility issues associated with new residential development in existing residential areas.*

52. *Consider the initiation of a Neighborhood Conservation Overlay District model study program to determine the appropriateness of such districts and, if appropriate, establish a new Neighborhood Conservation District to address compatibility of new residential construction in developed communities.*

BE IT RESOLVED, That EQAC recommends both of the 2005 infill development actions be moved to Priority 1 for 2006; and

BE IT FURTHER RESOLVED, That EQAC recommends that the County study amendments and policies from other counties, adopt such amendments where applicable, and coordinate with them to get support from the state where necessary.

Lot Coverage Zoning Ordinance Amendment
Adopted by the County Board on 11/15/05
(Arlington County, Virginia**)**

- The following table shows the maximum lot coverage percentage for any one-family dwelling lot in an "R" District ("R" Districts to include "R-20," "R-10," "R-8," "R-6," and "R-5, but not "R2-7"), if your lot is larger than 5,000 square feet in the "R-5" District, 6,000 square feet in the "R-6" District, 8,000 square feet in the "R-8" District, 10,000 square feet in the "R-10" District, and 20,000 square feet in the "R-20" District.

- Maximum main building footprint coverage on undersized lots in a zoning district (a lot which is smaller than 5,000 square feet in the "R-5" District, 6,000 square feet in the "R-6" District, 8,000 square feet in the "R-8" District, 10,000 square feet in the "R-10" District, and 20,000 square feet in the "R-20" District) shall be the same square footage as permitted on a standard sized lot (e.g., 6000 square feet in R-6) in the zoning district, subject to all applicable setback, side and rear yards and other building placement requirements.

- When a detached garage is provided in the rear yard, the maximum lot coverage may be increased as shown in the table below (in compliance with the requirements of 32.D.2.e.);

- Maximum main building footprint coverage shall be as shown in the table below.

- When a porch is attached to the front elevation of a one-family dwelling and has an area of at least sixty (60) square feet on the front of the building (exclusive of any wrap-around or side portion), the maximum coverage may be increased as shown in the table below.

Categories	***R-5***	***R-6***	***R-8***	***R-10***	***R-20***
Maximum Lot Coverage	45%	40%	35%	32%	25%
Maximum Lot Coverage with front porch	48%	43%	38%	35%	28%
Maximum Lot Coverage with rear detached garage	50%	45%	40%	37%	30%
Maximum Lot Coverage with rear garage and front porch	53%	48%	43%	40%	33%
Maximum Main Building Footprint Coverage	34%	30%	25%	25%	16%
Maximum Main Building Footprint Coverage with a front porch	37%	33%	28%	28%	19%
Main Buildings Footprint Cap	2380 sf	2520 sf	2800 sf	3500 sf	4480 sf
Main Buildings Footprint Cap with a front porch	2590 sf	2772 sf	3136 sf	3920 sf	5320 sf

- Existing main and accessory buildings or structures that, as of November 15, 2005, are not in conformance with the coverage requirements adopted on November 15, 2005, may be rebuilt within the building footprint and height and stories as they existed on November 15, 2005 if such structures are damaged or destroyed by fire, wind, earthquake, or other force majeure. Such rebuilding shall only be permitted if commenced within two (2) years after such damage or destruction.

- The definition of the lot coverage, main building footprint and main building footprint coverage are as follows:

  Lot Coverage: The percentage determined by dividing (a) the area of a lot covered by the total (in square feet) of: (1) the footprint of the main building; and (2) the total footprints of accessory buildings [counting only buildings with footprints larger than one hundred fifty (150) square feet, or with a height of two stories or more]; and (3) parking pads and driveways; by (b) the gross area of that lot.

  Main Building Footprint: The main building footprint shall include all parts of a main building that rest, directly or indirectly, on the ground, including, by way of illustration and not by limitation, attached garages, bay-windows with floor space, chimneys, porches, decks supported by posts and with floor heights that are four (4) feet or higher above grade, cantilevered decks with horizontal projections that are four (4) feet or more, and covered breezeways connected to a main building.

  Main Building Footprint Coverage: The percentage determined by dividing that area covered by a main building footprint in square feet by the gross area of the lot in square feet on which the main building is located.

Environmental Quality Advisory Council

Resolution Regarding the Fairfax County Residential Parking Study

March 8, 2006

WHEREAS, In response to the Board of Supervisors' request, a multi-agency team of Fairfax County staff conducted a parking study to review minimum residential parking requirements and make recommendations regarding their appropriateness; and

WHEREAS, The staff will likely recommend that the residential parking requirements be increased; and

WHEREAS, Parking surfaces, which are constructed from materials such as asphalt and concrete, increase the amount of impervious surface; and

WHEREAS, Impervious surfaces lead to environmental degradation including a large accumulation of runoff that contributes to nonpoint source water pollution; and

WHEREAS, Rather than facilitating the ownership of more vehicles by increasing parking requirements, the county should consider expanding and improving alternatives to private, motorized transportation; and

WHEREAS, Increasing density and creating transit-oriented developments reduces the need for parking; now therefore

BE IT RESOLVED, that the Environmental Quality Advisory Council recommends that the Residential Parking Study Recommendations be revised to:

a. balance environmental protection with the increased parking to achieve a net zero gain in impervious surface;
b. provide flexibility for parking requirements appropriate to different communities across the county;
c. consider reductions in parking requirements or specific maximum parking limits in areas where transit-oriented development is anticipated;
d. approach increases in parking as a part of a comprehensive transportation improvement that provides better pedestrian access, alternative transit opportunities, and community outreach to maximize the existing transportation infrastructure; and
e. include the improvement in Transportation Demand Management (TDM) as a factor in the required parking levels for new developments; and

BE IT FURTHER RESOLVED, that EQAC does not support the recommendations for increased parking requirements that are being considered by staff, particularly in areas where transit-oriented development is anticipated.

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

March 31, 2006

Chairman Connolly and Members of the Board:

On March 8, 2006, the Environmental Quality Advisory Council met with the Fairfax County Park Authority Board to discuss issues of mutual interest. Subsequent to the joint meeting, EQAC held a business meeting during which the Council authorized me, by a unanimous vote of members present, to prepare this letter to the Board supporting the following Park Authority needs:

- An interim bond referendum in 2006 to support a number of Park Authority initiatives. On January 25, 2006, the Chairman of the Park Authority Board sent a letter to Chairman Connolly requesting such a referendum (for $28,000,000) in support of several initiatives.

- An additional $550,000 to support the Park Authority's stewardship initiative, including efforts to inventory and manage natural resources on parkland, to provide a countywide assessment of the problem of invasive plants in parks and to initiate new invasives control efforts, and to pursue other stewardship management activities. While Park Authority staff has identified the need for this funding as part of a much greater effort to implement the Park Authority's Natural Resource Management Plan, this funding has not been incorporated into staff's proposed FY 2007 budget.

EQAC thanks the Board for its continued commitment to environmental protection and restoration efforts in Fairfax County and for its consideration of these Park Authority needs.

Respectfully submitted,

Stella M. Koch

Stella M. Koch, Chairman
Environmental Quality Advisory Council

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

cc: Fairfax County Park Authority Board
Michael A. Kane, Director, Fairfax County Park Authority
EQAC file: March, 2006

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

RESOLUTION SUPPORTING THE PARK AUTHORITY'S ENVIRONMENTALLY PREFERABLE PRODUCTS LEGISLATIVE PROPOSAL

August 9, 2006

WHEREAS, the Fairfax County Park Authority has proposed legislation that would encourage the purchase of environmentally friendly products for inclusion in the Board of Supervisors' legislative package for the 2007 Virginia legislative session; and,

WHEREAS, current legislation addresses purchasing recycled materials but does not address packaging and containers or other toxic goods and services; and,

WHEREAS, the proposed legislation would amend Virginia Code Sections 2.2-4301 and 2.2-4313 to permit comparisons of environmentally friendly products to include raw materials acquisition, production, manufacturing, packaging, distribution, operation, maintenance, reuse and disposal of the product; and,

WHEREAS, environmentally friendly products protect natural resources and have a reduced adverse effect on human health and the environment when compared to competing products; and,

WHEREAS, environmentally friendly products minimize waste, conserve energy, raw materials and water, and reduce the need for land fill space; and,

WHEREAS, the Board of Supervisors' Environmental Subcommittee has expressed a desire for greater recycling efforts by county agencies; and,

WHEREAS, the legislative initiative proposed by the Park Authority is consistent with the policies and objectives set forth in the Board of Supervisors' Environmental Agenda, including the objective of protecting and enhancing the environment.

NOW, THEREFORE, BE IT RESOLVED, That EQAC recommends that the environmentally friendly products legislation proposed by the Park Authority be included in the Fairfax County 2007 Virginia General Assembly Legislative Program.

2007 EQAC LEGISLATIVE PROPOSAL—ADOPTED BY EQAC ON AUGUST 9, 2006

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 9, 2006

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.

The Board of Supervisors' recently enacted Environmental Agenda commits to pursuing "state enabling legislation to ensure adequate infrastructure is in place for new development".

EQAC recommends that Fairfax County support enabling legislation to authorize localities to adopt adequate public facilities ordinances.

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 Senators Chichester, Norment, and Houck and Delegates Sickles, Marshall, William Howell and Orrock.

The Virginia Coalition of High Growth Communities (an organization comprised of at least 25 jurisdictions within Virginia, including Fairfax County) supports authorization for an adequate public facilities ordinance.

Numerous civic and environmental associations are on record supporting 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 are on record as opposing adequate public facilities legislation.

STAFF CONTACT PERSON(S):

Noel Kaplan (EQAC staff liaison)
Environment and Development Review Branch
Fairfax County Department of Planning and Zoning
12055 Government Center Parkway, Suite 730
Fairfax VA 22035

Phone: 703-324-1380
Fax: [redacted]
Email: [redacted]

2007 EQAC LEGISLATIVE PROPOSAL—ADOPTED BY EQAC ON AUGUST 9, 2006

POSITION STATEMENT FORM

GENERAL SUBJECT AREA -- TITLE OF PROPOSAL

TREE PRESERVATION ENABLING LEGISLATION

PROPOSAL: *(Provide brief description of legislative or funding position)*

Support legislation which enables Fairfax County to require the preservation of trees on development sites to meet canopy requirements when these exist on sites prior to development.

SOURCE:

Environmental Quality Advisory Council, August 9, 2006

BACKGROUND:

The existing enabling Virginia State Code § 15.2-961 deals strictly with tree canopy replacement requirements and provides little incentive for tree preservation. While tree preservation areas can and are being used to meet the requirement, tree planting is the tool of choice of developers. Without enabling tree preservation language, 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.

In the 2006 legislative session, SB 236 was introduced to add Virginia Code section 15.2-961.1. If adopted this proposed Code section would permit certain Northern Virginia localities, including Fairfax County, to require preservation of trees on development sites to meet tree canopy requirements in proportion to pre-development canopy. The bill would also allow those localities to increase the tree canopy required 20 years after development on residential sites.

Patrons for SB 236 included Senators Ticer and Howell and Delegates J.M. Scott, Sickles and Watts. The bill was passed by indefinitely in the Senate's Local Government Committee.
EQAC recommends that Fairfax County support enabling legislation similar to SB 236 to authorize localities to adopt tree preservation ordinances.

RECOMMENDATION:

POSSIBLE SUPPORT OR OPPOSITION BY ORGANIZATIONS:

Possible Support: The Fairfax County Tree Preservation Task Force, The Fairfax County Tree Commission, local non-profit conservation groups such as The Sierra Club, The Audubon Society, Fairfax ReLeaf, Inc., The Virginia Native Plant Society, And The Potomac Conservancy.

Possible Opposition: The Northern Virginia Builders Association. The Virginia Builders Association, and The National Association of Industrial Office Parks.

STAFF CONTACT PERSON(S):
(Provide name and phone number of County staff person(s) best able to provide any additional research or necessary information)

Noel Kaplan (EQAC staff liaison)
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Fairfax County Department of Planning and Zoning
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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

August 23, 2006

Chairman Connolly and Members of the Board:

On July 26, 2006, Harold L. Strickland, the Chairman of the Fairfax County Park Authority Board, transmitted a memorandum to me addressing two Carryover budget requests from the Park Authority. One request would support an Invasive Species Assessment Plan, while the other would support stewardship education efforts that would serve to strengthen and build upon current agency initiatives and abilities. Through a unanimous vote of members present at the August 9, 2006 meeting of the Environmental Quality Advisory Council, EQAC has asked me to convey its support for and endorsement of these Park Authority proposals.

I thank you for your consideration of the Park Authority's requests and for your continued commitment and dedication to environmental protection and restoration efforts in Fairfax County.

Respectfully submitted,

Stella M. Koch

Stella M. Koch, Chairman
Environmental Quality Advisory Council

cc: Fairfax County Park Authority Board
Michael A. Kane, Director, Fairfax County Park Authority
EQAC file: August, 2006

Environmental Quality Advisory Council
c/o Department of Planning and Zoning
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Endorsed by a majority of EQAC members—October, 2006

ENVIRONMENTAL QUALITY ADVISORY COUNCIL

Comments on the Park Authority Strategic Plan

The following comments deal only with portions of the plan that are seen as having direct environmental impact. The comments follow a top-down approach based on the strategy map (pg. 8) and the strategic objectives (pg. 9).

The first half of the FCPA Mission Statement is to protect and enhance the natural and cultural resources under its management, while the second half is to provide and maintain the facilities, etc. From the first half of the Mission Statement flows the major Process Component to Advance Stewardship (pg. 9). A derivative of this Process Component is the need to Ensure Workforce Readiness (pg. 43).

Some two years ago, the just-completed FCPA Natural Resource Management Plan was presented and reviewed at a joint meeting of EQAC and the FCPA Board. It is a well-conceived and comprehensive plan for stewardship of the extensive array of irreplaceable natural resources consigned to the FCPA. Yet this admirable plan remains largely unimplemented, and throughout the proposed Strategic Plan is mentioned mostly as a kind of noble philosophy but firm commitment for its implementation is somewhat lacking.

The current staffing levels are indicative of the minimal efforts to address the first half of the mission statement and the great preponderance of effort devoted to the second half. When you look at the fact that there are three staff directly devoted to natural resources, five staff directly devoted to cultural resources, and 50+ staff directly devoted to creating (exclusive of operating) the “built environment” it becomes obvious that the efforts applied to fulfillment of the Mission Statement are out of balance.

The importance of the first half of the mission statement was eloquently attested in the results of the recent Needs Assessment Survey which showed that the highest priority was given to acquisition and preservation of enclaves of natural environment and sufficient trails to afford access to and through them. The first and second paragraphs on page 28 are eloquent statements that show clear recognition by FCPA of what needs to be done. However, we know from talking with Tony Griffin and Ed Long that there is little likelihood of any discretionary money this year to beef up this area, so the FCPA will have to deal with it through internal readjustments or forego the opportunity to make the needed changes in emphasis. Thus, it is abundantly clear that some rebalancing and staffing adjustments are essential in order to properly address the stated mission.

The strategic initiatives enumerated under the section on Advance Stewardship form a sound plan but if unimplemented they are, in the words of T. S. Eliot, little more than ". . . paralyzed force, gesture without motion." The section Ensure Workforce Readiness (pg. 43) needs an additional paragraph inserted between Background paragraphs 4 and 5 to read: "Workforce rebalancing will need to be undertaken to assure a balanced approach to fulfillment of the Mission Statement." The Balanced Scorecard suggests that the natural resource protection has been only minimally addressed.

In short, EQAC believes that the FCPA has a sound Mission Statement but that the first half of it is currently being only minimally addressed. Several elements the proposed Strategic Plan would provide needed guidance for moving forward if, but only if, FCPA is willing to commit the necessary budgetary and human resources necessary to adequately fulfill the first half of the mission statement. How this is to be accomplished is the FCPA responsibility, but fulfillment of the full Mission is the goal for which the FCPA is held accountable. Any adjustments to the proposed Strategic Plan to better reflect this would definitely be in order.

APPENDIX B

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 2006 Environmental Excellence Awards were:

County Resident Award:	Ken Andrews
Organization Award:	Northern Virginia Soil and Water Conservation District
Business Award:	Wetland Studies and Solutions, Inc.

Ken Andrews was recognized for his personal dedication, energy, enthusiasm and commitment to a variety of environmental management and stewardship efforts in the Reston area. He has been a member of the Reston Association's Environmental Advisory Committee since 1998 and the chairman or co-chairman of this committee since 2000. Under his leadership, the committee established and implemented a variety of environmental programs addressing efforts such as stream monitoring and clean-up, invasive plant removal, recycling and the provision of dispensers for pet waste disposal. He has championed a variety of environmental outreach and stewardship efforts and has worked actively in the development and promotion of the Reston Association's Watershed Management Plan.

The Northern Virginia Soil and Water Conservation District was recognized for its commitment to environmental protection and restoration through:

- Environmental improvement projects.
- Outreach and education programs.
- Technical advice.
- Partnerships with government, industry and community organizations.

The numerous efforts of the district have included coordination of several hundred volunteer stream monitors, design and implementation of stream restoration and stream bank stabilization projects, a storm drain education program, design and implementation of low impact development demonstration projects in coordination with county agencies, assistance to

landowners with agricultural provisions of the Chesapeake Bay Preservation Ordinance, other technical assistance to county agencies and numerous education and outreach programs.

Wetland Studies and Solutions, Inc. was recognized for expertise, professionalism, innovation and leadership in the development industry in the fields of wetland and Resource Protection Area delineations and stormwater management and for collaboration with the county on a variety of related regulatory and policy issues. WSSI's efforts have included:

- Active participation on the county's Adequate Outfall Committee.
- Assistance with development of low impact development guidelines both in the county's Public Facilities Manual and in a regional manual under development.
- Contributions at public meetings regarding environmental issues.
- Demonstration of good environmental stewardship principles in wetland and Resource Protection Area delineations and site assessments.

WSSI has also led by example by implementing innovative low impact development and green building practices.

EQAC congratulates all award recipients.

In past years, Environmental Excellence Awards have been awarded to the following people and organizations:

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 C

ACRONYMS AND ABBREVIATIONS USED WITHIN THE ANNUAL REPORT

A&F	**Agricultural and Forestal**
ACM	**Assessment of Corrective Measures**
ANS	**Audubon Naturalist Society**
APHIS	**Animal Plant Health Inspection Service (federal)**
APR	**Area Plans Review**
AQS	**Air Quality Subcommittee (county)**
ASTM	**American Society for Testing and Materials**
BOS	**Board of Supervisors (county)**
CAA	**Clean Air Act (federal)**
CADD	**Computer-Aided Design and Drafting**
CAIR	**Clean Air Interstate Rule (federal)**
CAP	**Corrective Action Plan**
$CBOD_5$	**Chemical and Biological Oxygen Demand (5-day text)**
CBPA	**Chesapeake Bay Preservation Area**
CBPO	**Chesapeake Bay Preservation Ordinance (county)**
CCT	**Cross-County Trail**
CDC	**Centers for Disease Control (federal)**
CDF	**Citizens' Disposal Facility**
CESQG	**Conditionally Exempt Small Quantity Generator**
CFI	**Covanta Fairfax, Inc.**
CLRP	**Constrained Long Range Plan (regional)**
CO_2	**Carbon Dioxide**
COG	**Metropolitan Washington Council of Governments (regional-Also cited as MWCOG)**
CONAANDA	**Committee on Noise Abatement and Aviation at National and Dulles Airports (regional)**
CSI	**Clean Streets Initiative**
CTB	**Commonwealth Transportation Board (state)**
CY	**Calendar Year**
dB	**Decibel**
dBA	**Decibel (A-weighted level scale)**
DCR	**Department of Conservation and Recreation (state)**
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)**
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)**
EIS	**Environmental Impact Statement**
EPA	**Environmental Protection Agency (federal—also USEPA)**
EQAC	**Environmental Quality Advisory Council (county)**
ERC	**Employee Recycling Committee (county)**
FAA	**Federal Aviation Administration**
FAR	**Floor Area Ratio**
fc	**Fecal Coliform**
FCDOT	**Fairfax County Department of Transportation**
FCPA	**Fairfax County Park Authority**
FCPD	**Fairfax County Police Department**
FCPS	**Fairfax County Public Schools**
FCS	**Forest Conservation Section (county)**
FJLEPC	**Fairfax Joint Local Emergency Planning Committee (regional)**
FPP	**Forest Pest Program (county)**
FW	**Fairfax Water**
FY	**Fiscal Year**
GIS	**Geographic Information System**
Hazmat	**Hazardous Materials**
HHW	**Household Hazardous Waste**
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**
IPLS	**Integrated Parcel Lifecycle System**
IPM	**Integrated Pest Management**
IQ	**Internet Quorum**
IT	**Information Technology**

LDS	**Land Development Services function of the Department of Public Works and Environmental Services (county)**
LDSNET	**Land Development System Network (county)**
LEPC	**Local Emergency Planning Committee**
LID	**Low Impact Development**
LOS	**Level of Service**
MCL	**Maximum Contaminant Level**
MDA	**Maryland Department of Agriculture**
mgd	**Million gallons per day**
MLC	**McLean Land Conservancy**
MOU	**Memorandum of Understanding**
MPO	**Metropolitan Planning Organization**
MS4	**Municipal Separate Storm Sewer System**
MTBE	**Methyl teritary butyl ether**
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**
NiCad	**Nickel-Cadmium**
NMCPCP	**Noman M. Cole, Jr. Pollution Control Plant (county)**
NOx	**Oxides of Nitrogen**
NPDES	**National Pollutant Discharge Elimination System**
NPS	**Nonpoint Source**
NRCS	**Natural Resources Conservation Service**
NRMP	**Natural Resource Management Plan**
NVCS	**National Vegetation Classification System**
NVCT	**Northern Virginia Conservation Trust**
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**
NWS	**National Weather Service**
OHWM	**Ordinary High Water Mark**
OSDS	**Office of Site Development Services(county—now the Land Development Services function of the Department of Public Works and Environmental Services)**
OWML	**Occoquan Watershed Monitoring Laboratory**
PCB	**Polychlorinated Biphenyl**

PFM	**Public Facilities Manual (county)**
PLUS	**Planning Land Use System (county)**
$PM_{2.5}$	**Particulate Matter less than 2.5 microns in diameter**
PRM	**Principal Recyclable Material**
QA/QC	**Quality Assurance/Quality Control**
RA	**Reston Association**
RBRC	**Rechargeable Battery Recycling Corporation**
RDOC	**Recycling Drop Off Center**
ROP	**Rate of Progress**
RMA	**Resource Management Area**
RPA	**Resource Protection Area**
SARA	**Superfund Amendments and Reauthorization Act of 1986 (federal)**
SCRAP	**Schools/County Recycling Action Partnership**
SDWA	**Safe Drinking Water Act (federal)**
SIP	**State Implementation Plan**
SO_2	**Sulfur Dioxide**
SOCs	**Synthetic Organic Compounds**
SPS	**Stream Protection Strategy**
SWM	**Solid Waste Management**
SWMP	**Solid Waste Management Plan (county)**
TAC	**Technical Advisory Committee**
TAP	**Tree Action Plan (county)**
TCC	**Transportation Coordinating Council (regional)**
TDM	**Transportation Demand Management**
TIP	**Transportation Improvement Program**
TMDL	**Total Daily Maximum Load**
TOD	**Transit Oriented Development**
TPB	**Transportation Planning Board (regional)**
TRACON	**Terminal Radar Approach Control**
TTHM	**Total Trihalomethanes**
UDIS	**Urban Development Information System**
UFMD	**Urban Forest Management Division (county)**
UOSA	**Upper Occoquan Sewage Authority**
USACE	**United States Army Corps of Engineers**
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**
VOC	**Volatile Organic Compound**
VOF	**Virginia Outdoors Foundation**
VPDES	**Virginia Pollutant Discharge Elimination System**
VRE	**Virginia Railway Express**
WID	**Watershed Improvement District**
WSSI	**Wetland Studies and Solutions, Inc.**