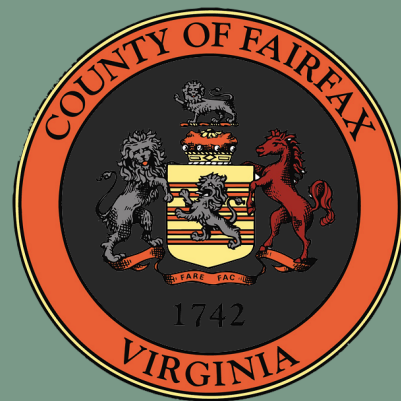


Environmental Quality Advisory Council

2021 Annual Report on the Environment



A Fairfax County, Va., publication



To request this information in an alternate format, call the Office of
Environmental and Energy Coordination, 703-324-7136, TTY 711

Cover design and photos by
Mackenzie Nordai, Student Member,
Environmental Quality Advisory Council

Photos

Top left
Bluebells at FCPA
Riverbend Park along
Potomac River

Top center
Eastern Tiger
Swallowtail on property
adjacent to FCPA Hidden
Pond Nature Center

Top right
Great Blue Heron along
Pohick Creek at FCPA
Hidden Pond Nature
Center

Bottom
Landscape image of Pohick Bay at Fort Belvoir

IN MEMORY OF DEBRA ANN JACOBSON



Photo courtesy of InsideNOVA.com.

Debra Ann Jacobson served for too short a time as the Dranesville District representative on EQAC from March 2018 until she became too ill to continue her work. She passed away in September 2021. She provided outsized contributions to the council in the few years she spent with us.

Debra was laser-focused and tenacious in her efforts to support the reduction of greenhouse gas emissions. She challenged the council to take aggressive action and did so in a manner that was at the same time both cordial and collegial. She was an advocate who was well-armed with, and supported by, data and scientific reasoning. She wasn't afraid to disagree, in the most agreeable manner, when necessary. She was single-minded in her determination to change the system, and she worked effectively, within the system, to make this happen.

Her brilliant white paper on the organization of climate and energy functions within the county stands out as an excellent collaborative effort that contributed greatly to the formation of the Office of Environmental and Energy Coordination. Debra's tireless pursuit in support of other issues, such as the solar Power Purchase Agreements, Energy Service Performance Contracts (ESPCs), and energy-efficient building codes are other example initiatives that led to positive changes in county practices.

Debra leaves a substantial legacy with EQAC. She was greatly respected and appreciated and will be missed.

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ANNUAL REPORT on the ENVIRONMENT 2021



Fairfax County, Virginia

Environmental Quality Advisory Council
December 2021

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INTRODUCTION

This year continues the significant departure in format for the Annual Report on the Environment from previous years. With the advent of the COVID-19 virus in early 2020 and the necessary shifts in work and focus required by county government and staff, the members of the Environmental Quality Advisory Council (EQAC) felt that while it is important to meet the requirements of our charter to report on the environment annually, it was equally important we continue to minimize demands on the staff who normally provide us with most of the data upon which we base our report. To that end, members of council have continued instead to have conversations with staff for updates but have requested little written data reports for this last year.

We are aware that the Board of Supervisors has had to face significant challenges in keeping people safe, fed, and housed, while keeping the economy functioning, and keeping our students educated during this ongoing pandemic. We sincerely appreciate and thank the board for their leadership on all of these daunting issues.

We also thank the Board of Supervisors for their continued support of environmental efforts during this past year, including the creation and funding of the Office of Environmental and Energy Coordination (OEEC), adoption of the Community-wide Energy and Climate Action Plan (CECAP), their ongoing efforts in creating the Resilient Fairfax Plan, the full funding of the Environmental Improvement Plan (EIP) including the Invasive Management Area program, Watershed Protection and Energy Conservation Matching Grant Program, and stream bank and meadow restorations, and lastly the county's ongoing support for the broad efforts of the Department of Public Works and Environmental Services.

FORMAT

In June 2017, the Board of Supervisors adopted an update of its Environmental Vision document. EQAC decided in 2018 that the updated Environmental Vision provided an opportunity to better align our Annual Report on the Environment with the updated Environmental Vision; we have followed the same structure again this year.

However, there will be no Scorecard this year. Our very abbreviated Annual Report of 2020 consisted of primarily revisiting the Scorecard. It would be difficult if not impossible to “Scorecard” the Scorecard of the Scorecard which is what would essentially happen if we were to attempt to include a Scorecard this year. With the return of full chapters this year, we will have the basis for a scorecard next year.

However, we have retained the revised structure which continues to address the seven core service areas identified within the vision document. The first six listed chapters address individual core service areas from the vision document:

- Land Use
- Transportation
- Water
- Waste Management

- Parks and Ecological Resources
- Climate and Energy

The seventh core service area, Environmental Stewardship, touches upon all of the other core service areas. Individual chapters may address this topic and we have also included a section on this area in the Appendix.

We have added the following chapters to this framework in order to ensure sufficient coverage of issues that are addressed at least to some extent in the Environmental Vision but have not been identified as core service areas in the vision document:

- Air Quality
- Wildlife Management
- Technology

We again refer you to the Appendices, in which you will find these additional topics that should be of use and interest:

- Appendix A: Spotlight on Fairfax County Schools
- Appendix B: Environmental Stewardship Opportunities in Fairfax County
- Appendix C: How to Report Environmental Crimes or Concerns in Fairfax County

EQAC 50TH ANNIVERSARY

WHAT IS EQAC

EQAC advises the Fairfax County Board of Supervisors (BOS) on matters about preserving, protecting, and enhancing the physical environment. EQAC provides a means of communication between the public sector and community on matters of county environmental quality.

EQAC is composed of fourteen members appointed by the BOS. One member is appointed from each of the nine county magisterial districts and four members are appointed at-large. These thirteen members are each appointed for a term of three years. In addition, one member is a student appointed for a term of one year.

EQAC usually meets the second Wednesday of every month at 7:15 p.m. Most meetings have invited speakers that report on issues of environmental concern in the county. The Council often sends letters and resolutions on these various topics of concern to the Board of Supervisors throughout the year. EQAC also produces The Annual Report on the Environment which reviews the state of the environment annually and is usually published in the late fall of each year.

HOW IT BEGAN

In 1967, then BOS Chairman Joseph Alexander agreed to meet with citizens requesting the establishment of a “Pick-up/Clean-up” month in the county. As a result, the Beautification Committee was formed.

In 1969, with concern for the potential adverse impact that urbanization would impose to the physical environment of the county, the BOS adopted a formal resolution establishing the policy and mission of the Beautification Committee. In September 1969, the first annual awards luncheon was held.

In 1970, the BOS began the process to create an Advisory County Environmental Conservation Commission for the purpose of providing a specific public body charged with the responsibility of reviewing aspects of the total physical environment of the county. When the Study Committee reported to the BOS, the Deputy County Executive “presented his views of the proposed Environmental Advisory Commission [and] recommending in lieu thereof augmented professional staff resources”. The BOS requested the Deputy County Executive to “set forth the framework of an inter-disciplinary team and how it might work and how it might relate to the citizens and to the study group created earlier.”

On June 30, 1971, the Beautification Committee presented to the BOS the 1971 Committee Annual Report and Recommendations.

On July 19, 1971, the BOS approved renaming the Beautification Committee to the Fairfax County Environmental Advisory Council and established its purpose as advising the BOS with respect to pollution programs and actions that affect the quality of the environment in the county.

Document of Key Dates in History of Fairfax County Beautification Committee attached to July 19, 1971, memo to County Executive.

On September 22, 1971, the BOS adopted a motion establishing the Environmental Quality Advisory Council (EQAC) to “foster a new and comprehensive approach to said environmental problems; ...”

On May 8, 1972, the BOS passed a resolution defining membership of EQAC, functions, etc., and created the Charter.

From 1975 to 1981, the EQAC Charter was amended numerous times for various reasons including eliminating the Stream Valley Board and adjusting the number of members.

OVER THE YEARS

Over the years, EQAC has produced the Annual Report on the Environment (ARE). Council members have added, modified, or deleted chapters to keep pace with evolving priorities including the Chesapeake Bay Preservation Act, Local Emergency Planning Committee covering hazardous materials, the BOS’s Environmental Agenda, the Cool Counties Policies and Programs, the Fairfax County Park Authority’s Natural Resources Management Plan, the Environmental Improvement Program, Watershed Advisory Groups, Stormwater Program and Projects Plan, and other initiatives. At present, usually each member of EQAC authors one of these chapters with data input from county staff and other agencies.

What started as an annual report printed in black and white with a basic scorecard grew to, in 2009, a multi-volume annual report with the summary edition printed and the full report online that included a new chapter on Climate Change and Fairfax County. One of the most significant changes occurred in 2017 when EQAC changed the ARE to align with the county’s Environmental Vision with chapters for the seven core areas: Land Use, Transportation, Water, Waste Management, Parks and Ecological Resources, Climate and Energy; plus, three additional chapters on Air Quality, Wildlife Management, and Technology. This edition also revised the Scorecard to include status of recommendations and the age of the recommendations; and added easy to recognize symbols for tracking.

Over the decades, more county residents commented at the EQAC’s Annual Public Hearing now held in January annually as well as contacted EQAC throughout the year to share comments. For ten years, EQAC’s Annual Public Hearing was carried live on county Channel 16 with a satellite location in the South County Government Center for people to not have to travel to the main Government Center.

As the county changes and the greater environment changes, EQAC will continue to review and revise the ARE, as well as community outreach, to serve the BOS and the citizens of Fairfax County.

EQAC has been fortunate to have staff support provided by the county. For decades that support came from Noel Kaplan in what is now the Department of Planning and Development. We also had the support and guidance from Kambiz Agazi, formerly the Environmental Coordinator for Fairfax County who, for 22 years, served as EQAC's environmental advisor. In 2020, the Office of Environmental and Energy Coordination assumed those responsibilities. They provide help with scheduling meetings, arranging requested speakers, and other support activities that are important for EQAC and county residents.

ACKNOWLEDGEMENTS

In the 50 years of EQAC, many individuals have served years doing significant service as council members or support staff.

Four noteworthy to mention:

Noel Kaplan, county staff appointed to support EQAC devoted many personal hours beyond his assigned staff hours to helping produce the ARE. His assigned staff hours assisted arranging guest speakers and many logistics to assure EQAC ran smoothly. His dedicated service was more than his job; as a citizen of the county, he dedicated many personal hours helping EQAC, a cause he believed in. EQAC owes a lot of what it became to Noel. Noel recently retired from Fairfax County.

Bob McLaren, appointed as a member at-large for over 29 years, was widely known in many environmental circles in and around the county. He served as Chair of EQAC for almost a decade and he consistently wrote one of the ARE chapters. It was interesting to watch him as he would patiently listen to a presentation and questions on issues EQAC was discussing and would then quietly weigh in with his input. He would comment why some thoughts expressed were not well thought out, but he was always accepting of everybody and their level of environmental understanding. Bob ended his last term in January 2016, and he was the longest serving member of EQAC. Sadly, Bob passed from this life in March 2020.

Frank Crandall served as the Dranesville District representative from January 1999 until he passed away in February 2018. For many years, he prepared the Wildlife Management chapter and Light Pollution section of this report. He also provided invaluable guidance on a range of other issues, from airport noise to riparian buffer protection and restoration. Frank was a passionate advocate for the environment and a spirited presence on EQAC. In May 2018, EQAC partnered with the McLean Citizens Association to honor Frank's memory through the planting of a Scarlet Oak tree and a Red Buckeye tree in Lewinsville Park, in McLean.

Debra Jacobson was a tireless volunteer and a passionate voice within the Fairfax County community, calling for better environmental policies and practice. Although her tenure on EQAC was relatively brief she is responsible for significant leadership on Climate and Energy Policies changes within the county. Debra's career took her from Capitol Hill to the Department of Energy, to The George Washington University where she was co-director of the GW Solar Institute and an adjunct professor of law. Debra passed away in September 2021 and

posthumously received the 2021 Fairfax County Environmental Excellence Award.

POSITIONS SUPPORTED BY EQAC THROUGHOUT THE YEARS

Land Use

- Support for urban design guidelines for transit station areas, suburb centers, community business centers and revitalization area
- Support for holistic Comprehensive Plan review processes (with a specific endorsement of Fairfax Forward)
- Support for transit-oriented development
- Support for enabling legislation for an adequate public facilities ordinance
- Support for an update to the 1996 "State of the Plan" document
- Support for the vision for Tysons as the urban center for Fairfax County
- Represented EQAC on the Tysons Task Force
- Supported GIS tools and data analytics for land use planning, public access, and future modeling
- Raised implications with county achieving build-out and transition to holistic approaches to support growth
- Encouraged green building standards and pushing towards net-zero practices
- Encouraged revitalization of older areas for both economic and environmental benefits
- Advocated for the interrelationship of Land Use and Transportation when planning communities
- Advocated for Improved transit utilization

Transportation

- Support for nonmotorized transportation initiatives, systems and supporting budget allocations
- Support for telework
- Support for transit use/opportunities
- Support for the study of emerging transportation technologies

Water

- Support for monitoring of water quality in the Occoquan Reservoir
- Support for the use of stormwater management best management practices, low impact development practices and better site design approaches for nonpoint source water pollution reduction and for stream protection
- Support for protection and restoration of intermittent stream buffer areas
- Support for stormwater management practices that minimize tree removal
- Support for upgrades of wastewater treatment plants for improved pollution reduction
- Support for the Northern Virginia Regional Water Supply Plan, with related recommendations addressing minimization of water usage and protection of the ecological health of the Potomac River
- Support for the county's Stormwater Management Ordinance

- Recommendations addressing water quality considerations associated with hydraulic fracturing
- Support for the Environmental Quality Corridor Policy
- Support for Occoquan Downzoning and Policy
- Support for strong Chesapeake Bay Ordinance provisions
- Support for Baseline Stream Assessment 2000
- Support for Watershed Management Plans
- Support for Stormwater Utility District
- Support for Ban on Uranium Mining
- Review of efforts to minimize the risks of lead in the County's drinking water
- Support for adequate funding of for stormwater management

Waste Management

- Support for the county's Solid Waste Management Plan
- Support for composting of food waste and other compostable wastes
- Support for comprehensive recycling efforts, as well as program reviews and modifications to support overall effectiveness
- Support for increased enforcement to reduce illegal dumping
- Support for a statewide container redemption fee
- Support for household hazardous waste collection opportunities
- Support for public education/outreach on waste management, recycling and hazardous materials matters
- Support for hazardous waste management for businesses that generate small quantities of hazardous wastes
- Support for state legislation to enable the establishment of fees for the use of disposable bags (plastic bags in particular)
- Recommendation to investigate ways to improve the quality of recyclables collected from residential and commercial properties
- Recommendation to examine opportunities to minimize redundant trash truck collection trips

Parks and Ecological Resources

- Support for a countywide natural resource management plan
- Support for state tree preservation enabling legislation, the related county Tree Conservation Ordinance
- Broad support for other goals/actions identified in the Tree Action Plan
- Support for funding for Fairfax County Park Authority ecological resource efforts
- Support for invasive species control efforts
- Support for the use of easements to protect open space, and, in particular, the related partnership between Fairfax County and the Northern Virginia Conservation Trust
- Support for limited and targeted spraying for fall cankerworm control

Climate and Energy

- Support for the development of a community-wide energy and climate plan
- Support for public and private sector energy efficiency efforts

- Support for climate change adaptation and resilience efforts
- Support for the county's Cool Counties initiative and subsequent related Board of Supervisors commitments
Support for the development and maintenance of an online dashboard highlighting county government buildings/facilities' energy use
- Support for green building policies for county and private sector projects
- Support for the hiring of a countywide energy coordinator
- Support for greenhouse gas emissions reporting by the state
- Promotion of evaluation of greenhouse gas footprints for residential and commercial buildings and facilities within the community (*beyond just county facilities*)
- Support for energy education and outreach efforts
- Support for a commercial PACE program
- Support for legislation to facilitate the removal of impediments to distributed renewable energy
- Support for recognition of companies that adopt energy-efficient approaches in their business practices
Support for legislation to increase prioritization of electric utility energy efficiency
Support for strong vehicle fuel economy standards

Air Quality

- Support for regional air quality planning and appropriate supporting county efforts
- Support for the strengthening of the county's air quality program and development of an air quality attainment strategy
- Support for strong motor vehicle emissions standards
- Support for funding for air quality compliance and related matters
- Support for measures to reduce pollutant emissions from school buses (e.g., alternative fuels, reduction of idling)

Wildlife Management

- Support for deer management efforts, including managed hunts, the sharpshooter program, and the archery program
- Support for the goose management program
- Support for an organizational structure and budget allocations to support sufficient wildlife management efforts

Technology

- Support for the comprehensive integration of land use data into one system
- Support for maintaining and expanding key data sets, including imagery and planimetric data improvements, and environmental monitoring
- Support for improved land development tracking online
- Support for public access to environmental data
- Support for providing county agencies with technical support and training to integrate technology into their workflow

General/Other

- Review and support of the Board of Supervisors' Environmental Vision
- Support for county government environmental coordination and staffing, including the establishment of the Environmental Coordination position and the establishment of the Office of Environmental and Energy Coordination
- Support for increased staff capacity for environmental reviews of development plans
- Support for the Environmental Improvement Program
- Support for, and implementation of, the Environmental Excellence Awards program
- Development of "How to Report Environmental Crimes" guidance
- Support for the county's Soil Science Office (and subsequent related efforts of the Northern Virginia Soil and Water Conservation District)
- Support for environmentally preferable purchasing
- Support for minimization of adverse impacts of outdoor lighting, and related support for the Outdoor Lighting Ordinance
- Support for airport noise-compatible land use planning near Dulles Airport, with related substantial limitations on rezonings for residential development in specific noise impact areas near the airport
- Support for the evaluation of flight operation options at Dulles Airport in order to minimize adverse community noise impacts
Recommendations regarding reporting of noise monitoring data by the Metropolitan Washington Airports Authority
- Recommendations regarding an amendment to the county's Noise Ordinance
- Support for measure to reduce visual pollution associated with signs in highway rights-of-way.

<u>Present EQAC Member, Years Served</u>	<u>District Represented, ARE Chapter Author</u>
Stella Koch, Chair (26 years)	At-Large, Water Chapter
Larry Zaragoza, Vice Chair (14 years)	Mount Vernon District, Climate and Energy Chapter
Bryan Campbell (2 years)	Braddock District, Wildlife Management Chapter
Johna Gagnon (28 years)	Lee District, EQAC Representative to the Fairfax Joint Local Emergency Planning Committee
Renee Grebe (6 years)	At-Large, Ecological Resources Chapter, ARE Editor
Richard Healy (7 years)	Mason District, Air Quality Chapter, ARE Editor, EQAC Representative for Tree Commission
George Lamb (19 years)	At-large, Land Use Chapter
Kenneth Lanfear (7 years)	Hunter Mill District, Technology Chapter, ARE Editor
Edward Monroe (1 year)	Dranesville District, Climate and Energy Chapter
Alex Robbins (8 years)	Providence District
Richard Weisman (14 years)	Sully District, Transportation Chapter
Clyde Wilber (8 years)	Springfield District, Waste Management Chapter
Michael Zatz (3 years)	At-Large, Transportation Chapter
Mackenzie Nordai	Student Member, Cover ARE

EQAC RECOMMENDATIONS – PRIORITY FOCUS

Each of the chapters presented in this report contains comments and/or recommendations for actions that, in our view, would further progress in support of the Board of Supervisors' Environmental Vision or related environmental considerations.

Given the global and local impacts of climate change this year we wish to focus on those recommendations throughout the chapters that focus on climate change, both the proactive measures to reduce environmental impacts, and measures that sustain and add to the components of resiliency that already exist within the county. We also recognize that all of these efforts will only add to support for implementation of One Fairfax goals that all of our citizens receive an equitable benefit from the county.

These recommendations include:

In Land Use

- Minimization of environmental impacts during the developing process which might include creating a request for a net environmental gain during development.
- Adopt Comprehensive Plan language and zoning regulations that would extend those existing strong green building standards for the public sector to private sector buildings.

In Transportation

- Develop a formal plan to increase light-duty electric vehicle (EV) registrations to at least 15% of total registrations by 2030.
- Develop a formal plan to increase transit and non-motorized commuting (including teleworking) to at least 30% by 2030, including setting interim target goals to be achieved by 2024 and 2027.

In Water

- Those policies and ordinances protecting streams and floodplains should remain unchanged or be enhanced.
- Fund the maintenance required for both the wastewater facilities and conveyance systems, and stormwater facilities and structures. Both systems contain aging infrastructure that will be heavily impacted during flooding.

In Waste Management

- Institute recycling data collection and reporting.
- Institute strong litter controls.
- Establish environmental purchasing numeric targets.
- Work with Covanta to reduce local air pollution.
- Consider environmental and safety benefits of sanitary districts petitions.

In Parks and Ecological Resources

- Have in place processes and incentives that increase tree and forest cover throughout the county.

- Increase the capacity for environmental review of development plans.
- Increase the capacity of county departments to manage invasive species.

In Climate Change

- Implement all county commitments for addressing climate change.
- Need a resiliency plan and steps for enactment.
- Need outreach and education plans for the public on climate change.

In Air Quality

- Encourage telework programs in the public and private sector.
- Create opportunities for and encourage the use of alternative forms of transportation.

In Technology

- Staff GIS support positions to gain full advantage of technology for decision making.

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I. LAND USE

Board of Supervisors' Environmental Vision:

*"The county will continue to refine and implement land use policies and regulations that accommodate anticipated growth and change in an economically, socially and environmentally sustainable and equitable manner while revitalizing older commercial centers, protecting existing stable neighborhoods, supporting sustainability, and supporting a high quality of life. The development priority will be mixed use, pedestrian, and bicycle-friendly transit-oriented development in activity centers. Policies and regulations will result, throughout the county, in the development and enhancement of vibrant and vital pedestrian and bicycle-friendly places where people want to live, work, shop, play, learn and thrive in a healthy environment, ensuring the protection, enhancement and restoration of natural resources, and the provision, in building and site designs, for the efficient use of resources."*¹

INTRODUCTION

Fairfax County covers approximately 395 square miles with over 1.171 million residents and 417,000 households². As the population has grown and the county has transitioned toward a more urban environment, the Fairfax County Comprehensive Plan, and the decision-making processes for how land is used have also evolved. When the first environmental vision was adopted in 2004, the county was fast approaching "build-out," whereby little vacant or undeveloped land was available. To continue growing after build-out, the focus of land use across the county shifted from new development to revitalization and redevelopment. The county is now well into that transformation and significant development continues to provide new jobs and housing. These changes allow the county to continue to grow and prosper within a finite environmental footprint and have the potential to improve negative environmental impacts from older projects.

Historical Perspective

Fairfax has gone thru several generations of planning, from the original farmland into the complex county that we live in. The 2019 EQAC Annual Report on the Environment (ARE) documents the major steps starting with the 1970's decision to *"thwart the negative effects of rapid urbanization by spending eighteen months and \$1.5 million on a planning program to control the rate and direction of future growth."* The legacy continued into the 1980s when the board took action to protect the Occoquan watershed. More than 38,500 acres of property were

¹ 2017 Fairfax County Environmental Vision, Section 2 A, pg. 6,
www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf

² Demographic Reports 2020, County of Fairfax, Virginia

down-zoned from one-acre to five-acre development, “citing a study that predicted the Occoquan reservoir could turn into a smelly swamp if some action is not taken.” Through the 1990s and 2000s, the focus was the Chesapeake Bay Preservation Act and Ordinance that codified the county’s resource protection areas (RPAs) and defined them using perennial streams as the ecological basis for protecting land from development.

With buildout, it has become more challenging to protect large parts of the county’s ecosystem. The challenge necessary for planning is most evident with the Tysons transformation that reimagined a primarily single use shopping and work district into a 24x7 livable community. The Tysons plan is supporting future live and work growth, as well as better environmental performance for streams and storms, along with equities such as access to natural spaces for parks and recreation. The key to building into the future is applying a wholistic lens that equally values business, social, cultural, and environmental priorities.

The most pressing environmental priority in 2021 is global climate change. The county has signed the Carbon Neutral Counties Declaration to become carbon neutral in its energy use for government operations by 2040³ and is developing the Community-wide Energy and Climate Action Plan (CECAP) to achieve a similar goal for all county emissions⁴. The wholistic approach that has evolved as the county approached buildout must now consider additional dimensions for reducing energy consumption and adopting technologies that align with a sustainable future. In 2020, the county updated the Green Building Policy with a path for county building to be net-zero energy by 2031 and an aggressive plan to reach that goal.⁵ The county appears to be on track to meet the public sector commitment of the Carbon Neutral Declaration. The private sector goal is much more difficult, and the county cannot delay on establishing specific policies and guidance that weave climate priorities and ecological protection into private sector developments and redevelopments.

CURRENT STATUS

EQAC is tracking two recommendations related to planning and tools supporting the planning process that have been on hold during the COVID-19 pandemic. The first addresses the State of the Plan and the Concept for Future Development map. EQAC has been a steady advocate for holistic planning processes that bring together all county and private concerns together as changes to the Comprehensive Plan and new developments are considered. This approach is more effective than opportunistic plans based on single parcels that were effective before the county was fully built out. The current Site-Specific Plan Amendment (SSPA) Process combines holistic planning with opportunistic development proposals. EQAC recommends a 10-year review of the State of the Plan to assess the prior and current processes to make sure the planning process is delivering the vision for development across the county.

Technology for Land Use and Planning

³ <https://www.fairfaxcounty.gov/news/fairfax-county-commits-carbon-neutral-energy-use-2040>

⁴ <https://www.fairfaxcounty.gov/environment-energy-coordination/cecap>

⁵ <https://www.fairfaxcounty.gov/environment-energy-coordination/green-building>

The second recommendation focuses on the county continuing to adopt technology that facilitates the land use and planning process. Although there is an entire ARE chapter dedicated to technology, this specific recommendation applies to the Planning and Land Use System (PLUS) that is integrating systems from five different agencies. Previously, EQAC recommended that PLUS include parcel-based information related to land use and the environment. PLUS was delayed during the pandemic, but the second release is now coming online. The parcel-based information for land use modeling is not directly included, but there is new data available related to permitting and PLUS supports data extraction for the comprehensive plan potential report. EQAC is updating the recommendation to focus on using the PLUS data to build the analytic algorithms necessary for planning and modeling.

Development Pressures

The 2019 EQAC ARE included a discussion of development pressures that were having a negative effect on the environment. EQAC supports development as part of a holistic process that balances growth with environmental protection and other elements of a healthy community. EQAC specifically called out the need for a development policy that calls for a **net-environmental benefit** across all new projects. Currently, net-benefit is defined for environmental corridors and the RPA, but the concept can be generalized to apply to all new development. This is quite appropriate for redevelopment where prior development had minimal protections and redevelopment can fix prior issues.

The 2019 EQAC ARE also listed several cases where negative environmental effects occurred on fragile land that was approved for development. This is caused by land values increasing past the point where unsuitable land that is slated for development is engineered so that it meets the bare minimum of the Comprehensive Plan and Zoning regulations. However, this ignores the ecological significance of these fragile lands. When looked at holistically, there is no justification for allowing inappropriate development. However, staff has told EQAC the criteria for such cases are minimum compliance. EQAC is updating our prior recommendation to include ecological impacts as a consideration along with net-environmental benefits.

These development pressures apply to all open space, not just fragile ecological lands. In 2021, the complicated case at Justice High School in Mason District arose. Justice High School was in desperate need of an addition, and the county approved bond funding for the project. The addition will eliminate a parking lot adjacent to the school. However, the school needs additional parking to replace the lost spaces. The neighboring Justice Park was considered open space that could support a new parking lot, and initial plans called for the Fairfax County Park Authority to transfer several acres to Fairfax County Public Schools (FCPS). The plan, however, did not recognize the value of urban open space serving the community in the zip code of highest socioeconomic need⁶. At the time of this report, FCPS is continuing discussions on the project. Such environmental and equity issues will become more common as open space becomes scarcer and land values continue to increase.

⁶ Zip code 22041 surrounds Justice Park and ranks #1 in socioeconomic need in Fairfax County: <http://www.livehealthyfairfax.org/index.php?module=indicators&controller=index&action=socioneeds>

Climate Change, Green Buildings, & Heat Islands

The county has made important commitments to address climate change, many of which depend on changing the way land is developed, redeveloped, and used. The updated Green Building standards for the county will transform public spaces to a net-zero energy use. EQAC is also concerned with the heat island effect, which has shown that tree covered surfaces and paved surfaces can differ by 40 degrees Fahrenheit. The county is currently tracking three net-zero projects, each with a different type of structure. These projects will provide valuable lessons for building and more importantly writing the policies and modifying the comprehensive plan to transform private spaces. EQAC is including a recommendation to accelerate the creation of private development planning guidance and zoning regulations that will align with the Community-wide and Energy Climate Action Plan (CECAP) report.

RECOMMENDATIONS

1. Update the State of the Plan and Concept for Future Development Map

Recommendation: ILU-2018.1 | Age: 3 years | Status: Restarting post COVID-19

Justification and Background:

EQAC recommends that the Board of Supervisors authorize an update to the State of the Plan document. The last State of the Plan covered 2000 to 2010. Since then, the county has seen significant growth and changes in process and technology. The plan transitioned from APR to Fairfax Forward with holistic and in-depth reviews, and now to SSPA. A review of the plan and the effects of the processes is timely.

EQAC recommends that the Board of Supervisors authorize the development of a Concept for Future Transportation, Development, and Green Infrastructure. The 1992 Concept for Future Development map has evolved into the Comprehensive Plan - Special Planning Areas⁷ and is used within the Countywide Transit Network Study to design the proposed High Quality Transit Network. These reflect the reality that the 1992 future has largely been realized and that a new future map that looks out 20 to 50 years is needed.

2. Advance Land Development Applications and Information

Recommendation: ILU-2018.2 | Age: 3 years | Status: Making progress

Justification and Background:

EQAC commends the release of the PLUS system to create a single system of record for land development. With PLUS complete, the next step is to develop analytical reporting tools for land use planning. This includes supporting the Comprehensive Plan Potential report as well as tracking mixed-use development at a more granular level beyond the residential and commercial categories. At any given point in time, there should be accurate information about the existing development as well as the development that can be expected in the next five to 20 years, based on the development pipeline from the PLUS system.

⁷ <https://www.fairfaxcounty.gov/planning-development/comprehensive-plan/special-planning-areas>

3. Improve Processes to Minimize Ecological Degradation from Development Pressure

Recommendation: 1LU-2019.3 | Age: 2 years | Status: Not Started

Justification and Background:

As the county addresses build-out, it is important to prioritize environmental protection of increasingly valuable open space. EQAC recommends that the county adopt a policy that all future development provides a net environmental benefit to the county. EQAC also recommends that the ecological function of existing land be a consideration when new development is proposed on open space.

This recommendation applies to development in mixed-use centers with dense growth potential, as well as infill development where fragile lands that are unsuitable for development are under development pressure.

4. Private Sector Green Building Standards

Recommendation: 1LU-2021.4 | Age: New | Status: New this year

Justification and Background:

EQAC commends the county for adopting strong green building standards for public facilities. With the recently accepted CECAP goal of net-zero energy by 2050, it is necessary to begin adopting Comprehensive Plan language and zoning regulations to encourage private sector land use to achieve the net-zero goals.

COMMENTS AND CONCERNS

1. Affordable Housing

EQAC commends the continued focus on affordable housing in the Communitywide Housing Strategic Plan and the Strategic Plan to Facilitate the Economic Success of Fairfax County. There are many development efforts under way that allow people to live and work nearby, reducing commuting pollution and development sprawl and decreasing pressure on natural areas.

2. Holistic Comprehensive Planning Process

EQAC is an advocate for holistic planning processes and supports the Site-Specific Plan Amendment (SSPA) Process. Holistic approaches align with the vision to consider economic, social, and environmental factors resulting in vibrant, healthy, and desirable places. Prior reports elevated this topic to a recommendation. EQAC will continue tracking the process to ensure that SSPA continues to:

- a. Prioritize large study areas that encompass multiple projects
- b. Include a robust screening process to ensure that the most appropriate projects are considered at a site-specific level
- c. Develop Policy Plan amendments that improve environmental outcomes across all projects

3. Social Media Innovation

EQAC commends the county for embracing new technology and leveraging the World Wide Web to share and interact with the public. The county should continue to integrate social media into the planning process and outreach efforts. The Route 7 Corridor Transit Study

included a crowd sourcing map that was the most frequently used source of input for the project with over 300 comments.⁸

4. Light Pollution - Outdoor Lighting Ordinance

Recommendation: ILU-2018.5 | Age: 3 years | Status: Complete

EQAC commends the county for updating the lighting ordinance.

5. County Green Buildings Standards

EQAC commends the county for adopting strong green building standards for public facilities that target net-zero over time and create aspirational examples for the private sector. EQAC urges the county to consistently hold private sector development to the highest building standards, both current standards and future ones that address climate change, and adapt a policy of net-benefit to the environment when considering exceptions.

⁸ <http://www.novatransit.org/uploads/studiesarchive/2017Envision%20RT7%20Report.pdf>

II. TRANSPORTATION

Board of Supervisors' Environmental Vision:

“A dependable, safe, efficient, accessible, and multi-modal transportation network is necessary to support the travel needs of Fairfax County residents now and into the future. The county will continue to develop policies and strategies that reduce the dependence on single-occupancy vehicle trips through smart development, efficient use of the transportation system, and by expanding the county’s bicycle, pedestrian, and transit infrastructure. The county will pursue transportation strategies in support of regional attainment of air quality standards.”⁹

INTRODUCTION

Transportation is a key element impacting the quality of life for county residents, and transportation planning choices must be made which balance a myriad of concerns, including but not limited to convenience, cost, efficiency, and environmental impact. Fairfax County residents and visitors are overwhelmingly dependent on automobile transportation due to the long distances that often must be traveled, as well as the lack of convenient or safe (actual or perceived) alternative options such as mass transit, bicycling, or walking. Yet it is this heavy dependence on automobiles that has resulted in some of the worst traffic congestion in the United States, and with that congestion large amounts of wasted time and productivity, as well as added pollution from vehicle emissions that degrades our air quality and contributes to climate change.

In 2020-2021 Fairfax County developed the Community-wide Energy and Climate Action Plan (CECAP) which lays out multi-sector greenhouse gas reduction strategies and identifies roles and responsibilities for federal, state and local stakeholders.¹⁰ CECAP focuses on actions that can be taken by the community (i.e., residents, business, and others) toward achieving a set of pre-defined emissions reductions goals. Specific goals for the Transportation Sector include increased use of electric vehicles (EVs) and increased use of transit and non-motorized commuting.¹¹ For this year’s Annual Report on the Environment (ARE), EQAC is focusing its transportation chapter on these Transportation Sector goals and is doing so in coordination with recommendations in other ARE chapters, including those in Climate and Energy; and Air Quality. Achievement of these goals will provide multiple benefits to Fairfax County including toward fulfillment of its Environmental Vision.

CURRENT STATUS

Fairfax County has significant transit and non-motorized infrastructure in place to build from. In addition to Metrorail, Metrobus, Fairfax Connector, and Virginia Railway Express (VRE), such

⁹ 2017 Fairfax County Environmental Vision, Section 2 B, pg. 11, www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf

¹⁰ <https://www.fairfaxcounty.gov/environment-energy-coordination/cecap>

¹¹ <https://www.fairfaxcounty.gov/environment-energy-coordination/public-engagement-ccap>

infrastructure includes sidewalks, trails, and micro-mobility modes (e.g., mopeds and scooters). As of 2018, about 8% of commuters were taking public transit (Metrorail, bus, or commuter rail), another 0.3% commuted by bike and 1.4% by walking. For 2018, the CECAP report stated that the percentage of commuting via transit and non-motorized vehicles, including teleworking, was 14%. The COVID-19 pandemic depressed transit ridership considerably and the impacts on future service and ridership are highly uncertain.

Fairfax County activities related to transit and non-motorized infrastructure include support for mass transit and active transportation. Fairfax County provides extensive financial support for the Metrorail, Metrobus, Fairfax Connector, and VRE. Active transportation is supported through the Countywide Trails Plan (last updated in 2018), Countywide Bicycle Master Plan (adopted in 2014), Area Plans that contain additional bicycle and pedestrian recommendations, and a recent effort to develop an overarching plan for active transportation. This latter effort, referred to as the ActiveFairfax Transportation Plan, is being led by the Fairfax County Department of Transportation (FCDOT) and it is currently funded through Phase One. The final products of Phase One are a Vision, Goals and Objectives statement; a Safe Streets for All Program Recommendations; and an engagement report. County staff is planning for BOS action on the Vision, Goals and Objectives, as well as the Safe Streets for All Program Plan in spring 2022. Phase Two, which includes the development of active transportation network recommendations and facility selection toolkits; coordination with and potential updates to the Comprehensive Plan; and an implementation approach that includes policy, program, and project prioritization strategies, has not yet been started. County staff requested funding for Phase Two as part of the carryover budget, and the public hearing for funding Phase Two was authorized at the BOS meeting on July 27, 2021. Action on whether to approve the funds is expected to occur at the October 5, 2021 BOS meeting. County staff is anticipating completion of the ActiveFairfax Transportation Plan by the end of 2022.

Travel Choices

The impact of the COVID-19 pandemic on transportation and travel within Fairfax County was significant, and primarily resulted in substantial reductions in vehicle trips and use of all forms of mass transit. In 2018, the area was ranked as having the 2nd worst traffic among U.S. cities, and the 19th worst traffic among all cities globally, though its position improved significantly in 2020 to 12th worst in the U.S. and 89th worst globally.¹²¹³ This substantial improvement can largely be attributed to the impacts of the COVID-19 pandemic on commuting patterns, with substantial numbers of workers in the Washington, DC area working from home for the majority of the year.

Each of the mass transit options available in Fairfax County has its own focus and role to play in reducing Single Occupancy Vehicle (SOV) trips with usage patterns often differing by region of the county and by day/time. The use of mass transit in Fairfax County had already been falling over the period 2016-2019, and the COVID-19 pandemic which began in March 2020 resulted in

¹² 2018 Traffic Scorecard Report, INRIX, 2018. <http://inrix.com/scorecard-city/?city=Washington%2C%20DC&index=19>

¹³ 2020 Traffic Scorecard Report, INRIX, 2020. <https://inrix.com/scorecard/>

further reductions as major changes took hold in work practices and commuting patterns.¹⁴ Beginning in March 2020, large numbers of workers who would typically be commuting to offices in and around the metro area began working from home full-time, and this trend mostly continued through the end of 2020 and into mid-2021. Many of those who continued commuting switched from using mass transit to SOVs to avoid contact with other individuals. As the COVID-19 pandemic is still ongoing, it is hard to know at this point in time to what extent travel choices in Fairfax County will return to pre-pandemic levels, though it is expected that the use of transit will remain depressed with people choosing SOVs due to health concerns.

Even with potentially permanent increases in telework, the travel method of choice for many county residents is likely to remain the SOV due to convenience, health concerns, and lack of convenient transit options. While attempts to reduce SOV trips by shifting travelers to alternative forms of travel will continue, there is also an opportunity to significantly improve local air quality and public health by transitioning more of the privately-owned vehicle fleet to EVs. As of 2019, only 0.8% of light-duty vehicle registrations in Fairfax County were EVs, and while the county has plans to transition the county fleet to alternative fuels, little has been done to increase the number of private light-duty EVs operating in the county.

Mass Transit Funding

Fairfax County provides substantial funding to the three primary mass transit operators in the county: Washington Metropolitan Area Transit Authority (WMATA), Virginia Railway Express (VRE), and Fairfax Connector. Contributions to WMATA and VRE are largely determined by previously negotiated agreements or formulas, and Fairfax Connector is funded fully at the discretion of the county. Fastran is a system operated by the Fairfax County Department of Neighborhood and Community Services which provides specialized transportation services to county residents participating in human services agency programs. As Fastran is not a transit system in the same sense as the others addressed in this chapter (i.e., those primarily serving commuters), additional detail is not included in this chapter.

Funding for WMATA operations supports both Metrobus and Metrorail and is budgeted at approximately \$152 million for FY 2022. The county's contribution to WMATA's operating budgets rises gradually each year by approximately 3 percent. The county's contribution for WMATA's capital requirements in FY 2022 is \$47 million, including debt service payments. The county's contribution to WMATA's capital is expected to reach over \$49 million by FY 2027.¹⁵

VRE funding is determined by a formula applied by the system's operators which calculates the subsidy owed by each jurisdiction based on the residence of riders. In FY 2021, the contribution from Fairfax County totaled approximately \$6.4 million, which accounted for 34.9% of jurisdictional contributions. The contribution for FY 2022 has been reduced to \$1.6 million, a

¹⁴ Fund 30000, Metro Operations & Construction, Department of Transportation FY 2020 Adopted Budget Plan: Performance Measures.

<https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2020/adopted/pm/30000.pdf>

Fund 40000, County Transit Systems, Department of Transportation FY 2020 Adopted Budget Plan: Performance Measures. <https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2020/adopted/pm/40000.pdf>

¹⁵ WMATA Capital Program Overview. <https://wmata.com/initiatives/capital-improvement-program/overview.cfm>

reduction of \$4.7 million. This reduction is the result of federal pandemic relief funds being applied to VRE operating costs, thereby decreasing local subsidies.¹⁶

The Fairfax Connector bus system is fully funded by the county, and in FY 2022 a total of approximately \$138 million was allocated for system expenditures. This was a substantial increase over the FY 2021 budget of \$123 million. The increases from FY 2020 to FY 2022 can be attributed primarily to an increase in the budget for capital expenditures associated with the planned purchase of new buses.¹⁷

Metrorail

Metrorail provides service on four rail lines serving Fairfax County, the Silver Line which serves Tysons and Reston; the Orange Line that serves Vienna and Dunn Loring; the Blue Line which serves Franconia and Springfield; and the Yellow Line that serves Huntington. WMATA reported that Metrorail ridership was down approximately 90% system-wide throughout most of 2020. More specifically to Fairfax County, when looking at May 2020 (i.e., post-pandemic) vs. May 2019 (i.e., pre-pandemic) data, entries at stations in Fairfax County were down between 80 and 90%.¹⁸

Virginia Railway Express (VRE)

The VRE provides service on two commuter rail lines, connecting Fredericksburg and Manassas to Union Station in Washington, D.C., with multiple stops in Fairfax County, and operates during peak periods on weekdays. The VRE serves as an alternative to commuting by car for those living in parts of Fairfax County that are not served by WMATA (particularly in the South County area). The VRE's future improvement plans are guided by their System Plan 2040, which was adopted in 2014, and has an overall goal to more than double ridership to 40,000 daily riders by 2040. In 2020, VRE ridership plummeted as a result of changes in commuting patterns due to the COVID-19 pandemic. As can be seen in Figure II-1, ridership

Figure II-1

Virginia Railway Express Change in Ridership Due to COVID-19

Weekly Average Ridership			
Month	2019	2020	Pct. Decline
April	92,802	2,379	97.4%
May	88,390	2,428	97.3%
June	98,627	3,965	96.0%
July	89,319	5,084	94.3%
August	92,186	5,849	93.7%
September	89,440	6,191	93.1%
October	91,640	6,778	92.6%
November	78,516	5,514	93.0%
December	74,868	5,119	93.2%
	2020	2021	
January	77,643	4,589	94.1%

SOURCE: Virginia Railway Express

¹⁶ VRE Financial Information. <https://www.vre.org/about/financial-information/>

¹⁷ Fund 40000, County Transit Systems, Department of Transportation FY 2022 Adopted Budget Plan: Performance Measures.

<https://www.fairfaxcounty.gov/budget/sites/budget/files/Assets/documents/FY2022/Adopted/volume2/40000.pdf>

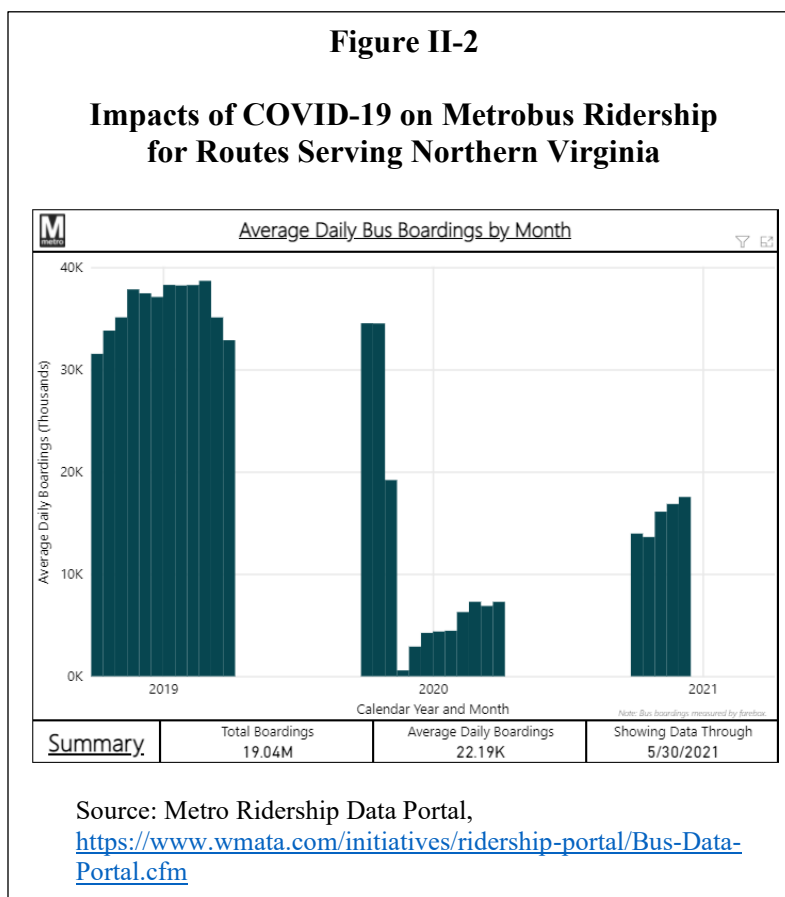
¹⁸ Metro Rider Snapshot – May 2021, Washington Metropolitan Area Transit Authority.

<https://www.wmata.com/initiatives/ridership-portal/upload/May-2021-Ridership-Snapshot.pdf>

declined across the system by 92-98% from 2019 to 2020. Even though ridership continued to increase through May 2021 as some workers returned to their offices, average weekly ridership still reached just 9,000, or about 10% of pre-pandemic levels.¹⁹

Metrobus

As with Metrorail and VRE, the impacts of changes in work patterns which began in March 2020 in response to the COVID-19 pandemic were severe. Figure II-2 presents average daily bus boardings by month for 2019 (pre-pandemic), 2020, and 2021 for routes serving Northern Virginia.²⁰ While Metrobus ridership initially reduced by roughly 90%, it has rebounded more quickly than both Metrorail and VRE ridership to about 50% of pre-pandemic levels. It is not clear the reason for this difference, though it might be attributed to the use of bus service by restaurant employees and other workers whose jobs are not in offices and whose businesses may have been closed in the early months of the pandemic but have gradually reopened beginning in summer 2020.



Fairfax Connector Bus

As with the other forms of mass transit serving Fairfax County, the Fairfax Connector experienced significant reductions in ridership with the onset of the COVID-19 pandemic. On April 11, 2020, in response to the pandemic, the Fairfax Connector suspended service on 39 bus routes, including all express service routes, and service was reduced on an additional 14 routes. In addition, to minimize contact between bus operators and passengers, rear door only boarding was instituted along with a suspension of fare collection. Fairfax Connector remained fare-free until January 2021 when fare collection was reinstituted. Figure II-3 presents weekly ridership trends between February and December 2020, with data separated into weekday, Saturday, and Sunday figures. Several interesting trends can be observed in the data, but most notable is that the system saw an uptick in ridership when it resumed full service in September. Additionally,

¹⁹ https://www.insidenova.com/headlines/vre-hopes-return-to-full-schedule-will-boost-ridership/article_a4cbe056-c3cf-11eb-970e-5754263397b8.html

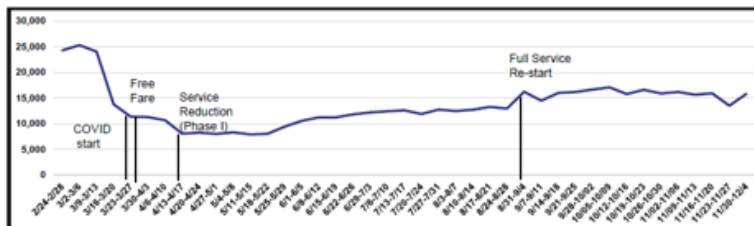
²⁰ Because many bus routes cross county boundaries, it was not possible to isolate only Fairfax County routes.

Saturday and Sunday ridership had rebounded to pre-pandemic levels by the end of 2020. Weekday ridership increased to about 60% of pre-pandemic levels but remained low presumably due to the fact that many office workers were continuing to work from home.

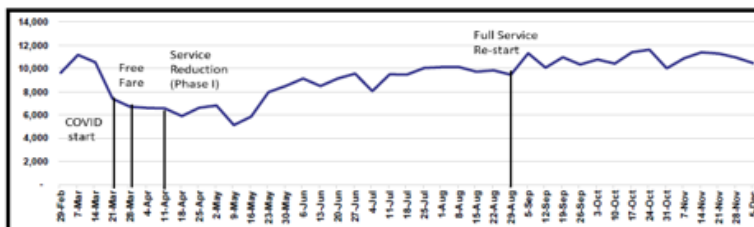
Figure II-3

Impacts of COVID-19 on Fairfax Connector Ridership in 2020

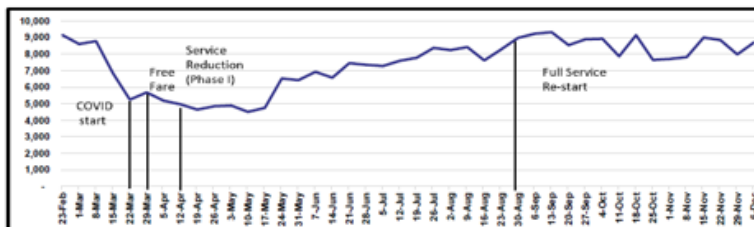
Weekday Ridership



Saturday Ridership



Sunday Ridership



Source: Presentation by Dwayne Pelfrey, Chief, Transit Service Division, Fairfax County Department of Transportation to the Transportation Advisory Commission Meeting, February 16, 2021. https://www.google.com/url?client=internal-element-cse&cx=005001772569716229004:a1ko_yakvwk&q=https://www.fairfaxcounty.gov/transportation/sites/transportation/files/Assets/Documents/PDF/TAC/Fairfax%2520Connector%2520COVID-19%2520response%25202-16-21.pdf&sa=U&ved=2ahUKewjr9cWyn5DyAhXMMlkFHSxcBFwQFjACegQIDhAC&usg=AOvVaw1x1w8_pWjkAXtZqwL89Axb

In July 2021, the Fairfax Connector implemented a service change which affected 10 bus routes. Of the 10 bus route changes, five were new bus routes that replaced Metrobus service that had been suspended by WMATA. These new bus routes (i.e., Routes 703, 715, 803, 834 and 835) maintain transit access and mobility to riders that would have been adversely impacted by the Metrobus service suspension.

In spring 2022, the Fairfax Connector is planning to implement service changes on 22 bus routes in support of Metrorail's Silver Line Phase 2 extension to Washington Dulles International Airport and Loudoun County. The new bus network will improve access for Reston and Herndon residents. It will also provide cross-county connections to employment centers in Centreville, Chantilly, and Tysons.

RECOMMENDATIONS

1. Develop a formal plan to increase light-duty electric vehicle (EV) registrations to at least 15% of total registrations by 2030

Recommendation: 2TRANS-2021.1 | Status: New this year

Justification and Background:

EQAC supports the goal of increasing EV registrations to at least 15% of total registration by 2030 which was set as part of the CECAP process and adopted by the Board of Supervisors but achieving it will require significant policy interventions on the part of the county. These interventions will need to both encourage greater purchases of electric vehicles by county residents, and significantly enhance the EV charging infrastructure across the county. Recommendations related to charging infrastructure are addressed in the Climate and Energy chapter, so this recommendation focuses on purchases of vehicles.

While other actions aimed at reducing emissions, such as the move toward more renewable fuels, have significant global impacts, reducing emissions from vehicles have primarily local impacts and the benefits accrue directly to residents of the county in terms of improved local air quality and associated improved health outcomes. Until recently, EVs were not an attractive option to most consumers because they had limited range and high initial costs compared to conventional gas-powered vehicles. However, in recent years dozens of new EV models with significantly increased range have been introduced by numerous manufacturers, with dozens more set to be offered in the coming years (including in the critical light truck/SUV category, which accounts for more than 70% of all new vehicle sales²¹).²²

With EVs representing only 0.8% of light-duty vehicle registrations in Fairfax County in 2019, getting to the goal of 15% of registrations being EVs will not happen without county interventions, primarily to help educate consumers on the economic benefits of EVs (since it is likely that economics, and not environmental benefits, will sway most consumers). The county is home to dozens of auto dealerships, which presents a unique opportunity to engage them in innovative efforts to achieve this goal, while keeping the economic benefits of increased EV sales in the county. To ensure that there is a clear path to achieving the goal set out in CECAP; EQAC recommends that county staff develop a formal plan to increase EV adoption among private citizens, describing both programs and initiatives to be undertaken and specifying interim goals for at least 2024 and 2027 to ensure that progress can be measured. Numerous examples exist for incentivizing EV purchases, including offering financial incentives (the county could consider a discount on personal property tax for EVs)

²¹ <https://www.statista.com/statistics/199980/us-truck-sales-since-1951/>

²² <https://insideevs.com/reviews/443791/ev-range-test-results/>

and establishing EV Purchasing Cooperatives such as is currently being done in Montgomery County, MD with the assistance of the Metropolitan Washington Council of Governments.²³

2. Develop a formal plan to increase transit and non-motorized commuting (including teleworking) to at least 30% by 2030, including setting interim target goals to be achieved by 2024 and 2027.

Recommendation: 2TRANS-2021.2 | Status: New this year

Justification and Background:

EQAC supports the CECAP goal of increasing transit and non-motorized commuting to 30% (including teleworking) by 2030. The county needs to develop a formal plan to demonstrate how the CECAP goal will be met, and to ensure a coherent and thoughtful approach is being proactively implemented. Setting interim target goals to be achieved by 2024 and 2027 will provide for greater accountability in its implementation. Specific activities that should be included in this plan include the following:

- Continued efforts to provide dedicated funding for Metrorail and Metrobus services.
- Integration of innovative approaches into first-mile/last-mile solutions in areas around existing and new Metro stations to address concerns about secondary road traffic congestion.
- The timely completion and implementation of the ActiveFairfax Transportation Plan, including providing the resources necessary to complete Phase Two of the plan. The ActiveFairfax Transportation Plan includes updating and combining the Bicycle Master Plan and the Countywide Trails Plan.
- A program be adopted to assess the impacts of past and future implementation of the ActiveFairfax Transportation Plan, including the establishment of performance measures that can be tracked over time and made available to the public. This would include regular bicycle facility counts or other monitoring for usage of bike lanes and trails. The results of such an assessment will provide valuable information of the efficacy of the plan in reducing SOV trips in favor of increased biking and will allow county staff to identify needed changes to the plan.

ADDITIONAL INFORMATION – NON-MOTORIZED AND EMERGING TRANSPORTATION

Bicycle and Pedestrian Transportation

FCDOT staff advances the county's bicycle and pedestrian programs in direct coordination with other agencies. Active transportation planning staff work with the Virginia Department of Transportation (VDOT) in their annual paving program to identify opportunities to add bike lanes and new or enhanced crosswalks on roads in Fairfax County. During the past few years, the county added an average of approximately 30 lane-miles of bicycle lanes and 10 new crosswalks per year. EQAC supports activities that provide for increased access, connectivity, safety, and equity for bicycle and pedestrian projects.

²³ <https://www.mwcog.org/purchasing-and-bids/cog-bids-and-rfps/2021/07/26/rfp-21-019---support-for-evpc-pilot-program/>

VDOT noted that their policy is to initiate all highway construction projects with the presumption that walking and bicycling will be accommodated. Pedestrian and bicycle facilities identified in Fairfax County's Comprehensive Plan are included in the scope of larger VDOT roadway improvement projects.

Electric Bike, Scooter and Moped Transportation

These modes of transport are getting increased use in Fairfax County and other jurisdictions. They provide inclusive riding opportunities for the less fit and mobility impaired. Electric bikes are allowed on county bike paths and most roads with a top powered speed of 20 mph. Electric scooters, also referred to as e-scooters, were approved by the BOS and went into use in Fairfax County in July 2021. Both LINK and Bird were approved to operate 300 e-scooters in Fairfax County as part of the county's Shared Mobility Device program. The Department of Cable and Consumer Services regulates the e-scooter and other operators through a permitting process. However, information was not provided about the extent to which these modes are being used in the county. E-scooters can be used on a highway, roadway, shared-use path, sidewalk, or crosswalk, with a maximum speed of 10 mph.

Emerging Technologies

Technologies such as autonomous vehicles, connected vehicles, and smart streets solutions have the potential to disrupt the well-established patterns illustrated by the commuting data and substantially increase commuting efficiencies in the county including addressing gaps in equity of access. They also have the potential to create major challenges and inefficiencies if not adequately understood and are considered as medium- and long-term planning decisions are made. Fairfax County has made limited efforts in this area.

The county implemented a Connected and Autonomous Vehicle (CAV) shuttle pilot program to provide first and last-mile connections from the Dunn Loring-Merrifield Metrorail Station to the Mosaic District. This effort was in partnership with VDOT's Office of Innovation. It was intended to provide information to VDOT and Fairfax County about the economic, public safety, environmental, and quality of life impacts of CAVs as they are being developed. VDOT also has a CAV program and a strategic Program Plan to guide VDOT in its preparations for a future with CAVs. FCDOT staff has attended VDOT trainings on CAVs.

Transportation Demand Management

The Transportation Demand Management (TDM) program is a policy tool which supports the goal of reducing SOV dependence. Through the land use entitlement process, commitments are obtained from developers to provide employees or tenants with alternatives to SOV travel or to otherwise incentivize the use of such alternatives. Through transit incentives and car or van pools, TDM reduces SOV use. As of August 2021, there were 125 land development cases with proffered TDM commitments, of which 30 are reporting annually on their progress toward their goals based on the phase of their development.²⁴ In addition, the number of employers with TDM programs in place in FY 2021 was estimated to be 362, an increase of 2.8 percent from the

²⁴ FCDOT Response to EQAC, September 3, 2021

352 with programs in FY 2020. EQAC will continue to monitor information about TDM programs being used in Fairfax County, including quantitative impacts of those programs.

MAJOR PROJECT UPDATES

While there are numerous transportation projects being developed and implemented at any given time across the county, there are currently two major projects that have such broad impacts that a specific update is warranted.

Transform 66

During 2021, construction was ongoing to install express lanes along Interstate 66 (I-66) between U.S. Route 29 in Prince William County and Interstate 495 (I-495) in Fairfax County. The I-66 eastbound widening between I-495 and Fairfax Drive (Route 237) in Arlington County was substantially completed by the end of 2020. The project, named “Transform 66,” consists of projects east and west of I-495/Capital Beltway.

- East of I-495 is the Transform 66 Inside the Beltway Project. The project is being administered as a design-build project to add an additional lane on I-66 eastbound from the Route 267/Dulles Connector Road to Fairfax Drive, a new ramp-to-ramp direct access connection from eastbound I-66 to the West Falls Church Metro Station at the Route 7 interchange, and a new bridge for the Washington and Old Dominion (W&OD) Trail over U.S. 29/Lee Highway. The additional lane on I-66 eastbound opened to traffic in December 2020. The new ramp-to-ramp direct access connection to the West Falls Church Metrorail station opened in July 2021 and the trail bridge opened in March 2021.
- West of I-495, the Transform 66 Outside the Beltway Project is a public-private partnership (P3) between the Commonwealth of Virginia and I-66 Express Mobility Partners (I-66 EMP). The \$3.7 billion project consists of multimodal improvements to 22.5 miles of the I-66 corridor from I-495 to Gainesville. Substantial progress has been made on portions of the project such as improvements to the Route 28 interchange. As part of this project, an east-west trail will be constructed parallel to I-66 that will connect Gallows Road to Centreville. The I-66 trail will consist of newly constructed sections as well as existing facilities. Parts of the trail will be delivered respectively by I-66 EMP, FCPA, and VDOT. Some trail segments will be upgraded and constructed after the I-66 project is completed and when funding becomes available. In addition, preliminary designs show some trail segments inside the sound barrier (for example, those closer to I-495). EQAC supports the timely completion of the I-66 trail.

Richmond Highway Corridor Improvement Project

In cooperation with Fairfax County, VDOT is administering the \$415 million Richmond Highway Corridor Improvement project to widen Richmond Highway (U.S. 1) from four to six lanes between Jeff Todd Way and Sherwood Hall Lane. In addition, the project will provide separate bicycle and pedestrian accommodations on both sides of the road and will reserve the median width necessary to accommodate a future, planned Bus Rapid Transit (BRT) system. The Richmond Highway BRT is a separate project administered by FCDOT. The Richmond Highway Corridor Improvement project is guided by the vision for a multimodal and environmentally friendly Richmond Highway as described in the Embark Comprehensive Plan

Amendment which was adopted by the BOS in March 2018. In March 2019, VDOT held the Design Public Hearing (DPH) for the project plans and received BOS endorsement for the DPH plans on July 30, 2019. In October 2020, the Federal Highway Administration issued a Finding of No Significant Impact for the Environmental Assessment as required by the National Environmental Policy Act review process. For the right-of-way, utility relocation, and construction phases, the project is being split into two phases. Phase 1 is from Jeff Todd Way to just north of Frye Road, and Phase 2 is from just north of Frye Road to Sherwood Hall Lane. In April 2021, VDOT issued a Notice to Proceed on the right-of-way acquisition for full parcel acquisitions for both phases. Right-of-way acquisition for partial parcels requires separate authorization after utility field inspection plans are reviewed. The utility field inspection review for Phase 1 began in the spring of 2021. The utility field inspection review for Phase 2 is anticipated to start in the fall of 2021. Construction for Phases 1 and 2 is anticipated to start in the summer of 2025 and in the winter of 2027, respectively.

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III. WATER

Board of Supervisors Environmental Vision:

Board of Supervisors' Environmental Vision:

“Fairfax County considers the protection, restoration and enhancement of environmental quality through the sustainable management of its water resources to be one of its highest priorities. Through its policies, regulations, and outreach to the community, the county will implement the best available technology, including advanced and innovative practices to protect and restore streams, wetlands and associated aquatic resources, promote water conservation and ensure the most effective stormwater management, advanced wastewater treatment, and the safest, most reliable drinking water supply for future generations.”²⁵

INTRODUCTION

The following statement can be found in the Introduction to the Water section of the Board of Supervisors' Environmental Vision. It captures well the concept of “One Water.”

“Water is the essence of life – without it, life on our planet would not exist. The availability of clean water and presence of functioning aquatic systems are fundamental to sustaining viable ecosystems and human societies. Fairfax County’s natural aquatic resources are vast; its 30 watersheds encompass myriad wetlands, tidal marshes, lakes, ponds and reservoirs – and include well over 1,000 miles of streams and associated riparian corridors. Fairfax County highly values water as an essential part of our ecosystem through protecting and restoring the natural environment, helping provide safe drinking water, and preserving the aesthetic and recreational opportunities these natural resources provide for county residents.”

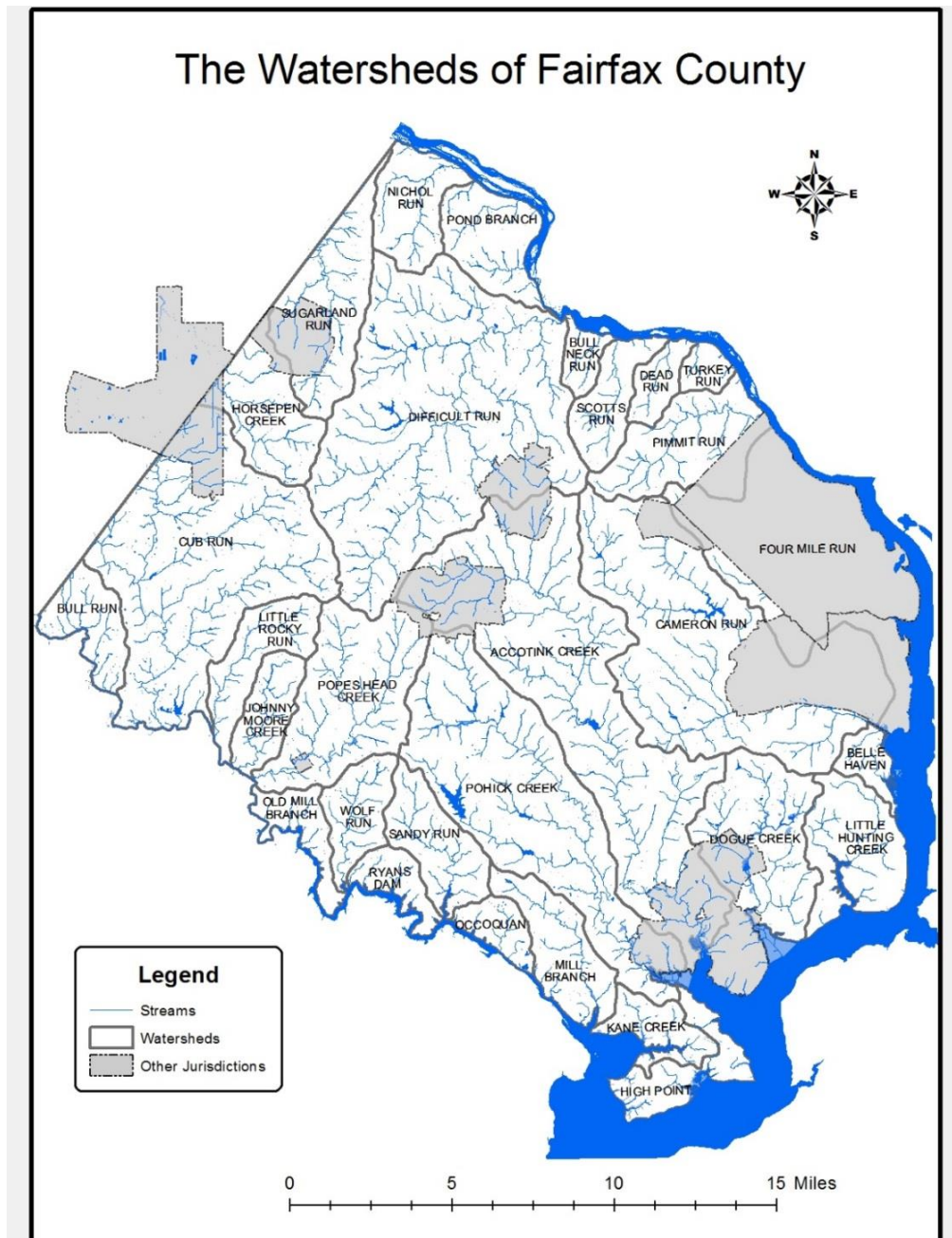
This “one water” concept envisions water as a resource regardless of its location or condition in any one system. This is the lens through which water is viewed in this chapter of the Annual Report on the Environment.

The concept of “one water” is illustrated in how we fit into the larger water ecosystem. The largest watershed in the county is Difficult Run (58 square miles), with ten smaller streams that drain into its main stream. Difficult Run, in turn, drains into the Potomac River. The Potomac River watershed is a sub-watershed of an even larger watershed, the Chesapeake Bay watershed, which has an area of 64,000 square miles and includes portions of the states of New York, Pennsylvania, Delaware, West Virginia, Maryland, and Virginia as well as the District of

²⁵ 2017 Fairfax County Environmental Vision, Section 2 C, pg. 17,
<https://www.fairfaxcounty.gov/living/environment/environmental-vision-water.pdf>

Columbia. All of Fairfax County ultimately drains to the Potomac River, which drains to Chesapeake Bay.

Figure III-1: The Watersheds of Fairfax County



The concept of One Fairfax when applied to the water resources of the county would mean that all residents, neighborhoods, and water resources would receive equitable treatment by the Fairfax County government.

While the natural world does not draw distinct lines for water movement throughout the ecosystem, human management of water does fall into three separate management systems:

- 1) Drinking water – We extract water from groundwater and surface waters and then treat that water, often of compromised water quality, to drinking water standards.
- 2) Wastewater management – The collection and treatment in closed systems of sewage from homes and business to return it to groundwater or surface waters.
- 3) Protecting and restoring streams, ponds, and lakes – Stormwater management is the art and science of managing surface water runoff, often polluted, to protect our streams, ponds, lakes and rivers. It includes the restoration of those resources to ecologically healthier systems.

Ultimately the health and condition of our rivers, streams and ponds is a reflection of how we have managed our drinking water needs, and our wastewater and stormwater.

III.A. DRINKING WATER

INTRODUCTION

The majority of the county's drinking water supply is provided by Fairfax Water and comes from the Potomac River and the Occoquan Reservoir. For a small number of residents, community wells and private wells provide drinking water.

An overview of drinking water must include a discussion of water treatment facilities and the depth of monitoring within the system. It must also include a discussion of emerging contaminants; regional and local policies for land use/source water protection; and water allocation agreements, especially during droughts.

CURRENT STATUS

Fairfax Water – Potomac River and Occoquan Reservoir Supply

Fairfax Water withdraws water from the Potomac River near the James J. Corbalis Water Treatment Plant and from the Occoquan Reservoir at the Frederick F. Griffith Water Treatment Plant. Fairfax Water provides drinking water to nearly two million people in Northern Virginia, including most residents of Fairfax County. Fairfax Water also provides drinking water to the Prince William County Service Authority, Loudoun Water, Virginia America Water Company (City of Alexandria and Dale City), Town of Herndon, Town of Vienna, Fort Belvoir and Dulles

Airport. As of 2014, both the City of Fairfax and the City of Falls Church systems were incorporated into Fairfax Water's system.

In addition, Fairfax Water purchases treated water from the U.S. Army Corps of Engineers, Washington Aqueduct Division, treated at the Dalecarlia and McMillan water treatment plants in Washington, D.C.

Fairfax Water meets all state and federal regulatory requirements. In addition, analyses are performed to monitor the quality of Fairfax Water's raw water sources, water within the treatment process and water within the distribution system. Water undergoing the treatment process is continuously monitored for pH, turbidity, coagulation efficiency and disinfectant residuals using technically advanced online monitoring systems. Chlorine, pH and temperature testing is also performed at sample sites throughout the system using portable instrumentation.

Fairfax Water provides highly advanced treatment for the water served to its customers. A study conducted by the Water Research Foundation concluded that using a combination of ozone and biological activated carbon is very effective in removing broad categories of endocrine disrupting chemicals, personal care products and pharmaceuticals. Fairfax Water uses both ozone and biological activated carbon at both of its treatment plants as part of its multi-barrier water treatment approach that also includes coagulation, sedimentation, filtration and disinfection. Additional information about Fairfax Water's treatment process and water quality is available at www.fairfaxwater.org/water-quality.

Monitoring Treated Drinking Water Supplies and Reports

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. Fairfax Water's current Water Quality Report is available for review on its website at www.fairfaxwater.org/water-quality.

Potomac River Water Quality Monitoring

The Metropolitan Washington Council of Governments (COG) coordinates with state and local government officials, scientists from local universities and other experts from around the region who collect and analyze water quality monitoring data from local waters. COG, in turn, shares this body of knowledge, which is useful for evaluating the effectiveness of management actions, with its members through fact sheets and periodic workshops. The most recent of these, "New Data on Nutrient Dynamics and SAV in the Potomac Estuary," held in winter 2017 (meeting materials can be downloaded at https://www.chesapeakebay.net/channel_files/25553/sav_syn_summary_nov_2017b.pdf), explored the insights derived from new monitoring data on the timetable for achievement of water quality standards in the Potomac estuary.

Wells and Groundwater Monitoring

There are approximately 15,000 family residences and businesses that are served by individual well water supplies in Fairfax County. The Fairfax County Health Department offers private well evaluations for \$50.00 and the application can be accessed on the county's website:

<https://www.fairfaxcounty.gov/health/sites/health/files/assets/documents/pdf/forms/eho24-well-sewage-evaluation.pdf>

The Virginia State Health Department Office of Drinking Water regulates the 44 public well water supplies in Fairfax County. The operators of these systems are required to conduct quarterly water sampling and analysis.

Monitoring Groundwater

On January 1, 2014, the Eastern Virginia Groundwater Management Area was expanded to include the areas of Fairfax County located east of Interstate 95, [9VAC25-600-20](#).

There is one United States Geological Survey (USGS) groundwater monitoring well in Fairfax County ([385638077220101](#)) that is part of a larger USGS monitoring system of 174 wells found throughout Virginia.

RECOMMENDATIONS

- 1. Continue and enhance as needed the protection of the Occoquan Reservoir. The studies and actions listed below have reaffirmed over the last 50 years the need for continued protection of the waters of the Occoquan Reservoir that provide part of our drinking water supply.**

Recommendation: 3AW-2021.1 | Status: New this year

Justification and Background:

During the latter part of the 1960s, the Occoquan Reservoir exhibited signs of advanced eutrophication, such as frequent and intense algal blooms (including cyanobacteria), periodic fish kills and taste and odor problems. All these issues threatened the health of the reservoir as a water supply source. Although the reservoir is only partially drained by Fairfax County streams (about 17 percent of the watershed is located in Fairfax County), the county has provided leadership in the region for land use modifications to protect water quality:

- Occoquan Policy (1971) and Upper Occoquan Service Authority (1978).
<https://www.uosa.org>
- Fairfax County's "Downzoning" Action and Best Management Practice Requirement (Initially 1982).
<https://www.fairfaxcounty.gov/publicworks/stormwater/facility-fact-sheets>
<https://www.fairfaxcounty.gov/publicworks/stormwater/facility-fact-sheets>

- Fairfax Water Shoreline Easement Policy (2004).
<https://www.fairfaxwater.org/shoreline-easement-policy>
- Fairfax County New Millennium Occoquan Watershed Task Force Report (2003).
<https://www.novaregion.org/DocumentCenter/View/247/OTFFinalReport12703>

2. **Fund monitoring of emerging contaminants and the rising sodium levels in the Occoquan Reservoir.**

Recommendation: 3AW-2021.2 | Status: New this year

Justification and Background:

Emerging Contaminants: The Occoquan Watershed Monitoring Lab budget has remained flat-funded for almost 10 years now. With existing budget constraints, it is impossible for the lab to look to add emerging contaminants (such as EDCs--endocrine disrupting compounds) or other compounds to those already being monitored. This could have a significant impact on the knowledge base as compounds such as emerging contaminants become more important to monitor and follow.

Synthetic organic compounds (SOCs) have been monitored quarterly in the Occoquan Watershed since 1982. The program is funded by the Fairfax County and was established under a recommendation by EQAC. Water samples at stream and reservoir stations and sediment samples at reservoir stations are monitored quarterly. Fish samples are taken at three reservoir stations semi-annually.

The Occoquan Watershed Monitoring Laboratory (OWML) has had no contract for SOC monitoring for since FY 2017. The results available for calendar year 2016 indicate that it was an excellent year, as no SOC were detected at any level of concern in either water, sediment or fish samples. Of course, these results could change when the samples currently being analyzed from 2016 are added to the database, but past history of the program indicates that the likelihood of that happening are very small. Overall, the partial available results of the SOC monitoring in 2016 show that the watershed conditions with regard to SOC continues to be excellent.

General monitored water quality in the Occoquan Reservoir has also remained stable over the years. While the reservoir continues to be enriched with nutrients (eutrophic), the water quality has not deteriorated from what it has been for some time now. The OWML monitoring program serves as a means of providing advance notice should any conditions deteriorate, whether in the short- term or the long-term. Updates continue to be made to the OWML website (www.owml.vt.edu), and stakeholders can continue to access near-real-time field data at various stream sites.

A large portion of the lab's resources has been focused on salinization issues in the watershed and region. See discussion below.

Salt and Chloride; Fairfax Water has observed increasing trends for both sodium and chloride in the source waters since the 1980s, especially in the Occoquan Reservoir. Many studies have indicated that this is a Furthermore, chloride water quality impairments have been linked to winter deicing/anti-icing activities. Sodium and chloride in the source waters cannot be removed by the conventional water treatment process. If the concentration of these parameters continues to increase in the source waters, membrane treatment might be the only viable option, but it is an extremely expensive option. To address this issue throughout the Northern Virginia region, the Virginia Department of Environmental Quality (DEQ) has gathered a Stakeholder Advisory Committee (SAC) and formed six workgroups to work towards the development of a Salt Management Strategy (SaMS). Fostering collaboration between all stakeholders involved in or impacted by snow and ice management and application of road salts is intended to encourage long-term support for improved practices that protect public safety and lessen the negative impacts on environment, infrastructure and public health. The implementation of best management practices (BMPs) like training and certification programs, and improved salt application equipment and practices can achieve multiple goals. Fairfax Water is an active participant in the SAC, as well as the different workgroups. More information on the initiative is available at:

<https://www.deq.virginia.gov/water/water-quality/tmdl-development/salt-management-strategy-development>.

COMMENTS AND CONCERNS

1. There is a need to provide adequate supplies of drinking water and to protect the Potomac River ecosystem during low flow periods (droughts), the three major water utilities in the Washington Metropolitan Area (WMA) (Fairfax Water, Washington Aqueduct and Washington Suburban Sanitary Commission) became signatories to agreements that lay out the rules for allocation of water during low flows. Upstream dams, the Jennings-Randolph Dam on the Potomac River and the Savage River Dam, along with Seneca Lake in Montgomery County, Maryland were constructed. Releases from these reservoirs can be used to augment natural river flows during times of drought.

During droughts, the Washington metropolitan area's three major water suppliers and the Interstate Commission on the Potomac River Basin (ICPRB) Cooperative Water Supply Operations on the Potomac (CO-OP) track reservoir storage, Potomac River flow, and water use to ensure that Potomac River flow is adequate to meet environmental flow and water supply demand requirements. Since the creation of the region's cooperative water supply system in 1982, low flow conditions necessitating the release of water from upstream reservoirs to augment Potomac River flow have occurred in only three years: 1999, 2002, and 2010. Since 2010, flow in the Potomac River has been more than adequate to meet drinking water withdrawal needs by the region's major water suppliers and no additional releases from upstream reservoirs to augment water supplies have been needed. Information on water supply status, recent Potomac River flow, reservoir storage, water supply outlooks and precipitation maps can be found in the "Drinking Water and Resources" section of the ICPRB website under "Cooperative Water Supply Operations on the Potomac":

<https://www.potomacriver.org/focus-areas/water-resources-and-drinking-water/cooperative-water-supply-operations-on-the-potomac/>.

2. There is a need to continue to plan and provide for an increase in drinking water supplies. Every five years since 1990, the CO-OP section of ICPRB has conducted a 20-year forecast study of demand and resource availability on behalf of the three major WMA water utilities (including Fairfax Water). The most recent study (2015) provides forecasts of water demand and availability through the year 2040 by analyzing demand trends, population growth and available water resources. It also provides recommendations for future planning. This study is available at: www.potomacriver.org/wp-content/uploads/2015/08/ICP15-04a_Ahmed.pdf.

The 2015 Demand Study identified the need for additional water supplies by 2040 to meet the growing water demands in the region. To address this need, the WMA Water Supply Alternatives Study is currently under way; it is providing an evaluation of potential structural and operational alternatives available to the utilities for the years 2040 and 2085 that will enable them to improve future system reliability in the face of growing demands, decreasing river flows due to increases in upstream consumptive use and the potential impacts of climate change. The final report is available at: www.potomacriver.org/wp-content/uploads/2017/08/ICP17-3_Schultz.pdf.

The June 3, 2014, Fairfax County Board of Supervisors adoption of an amendment to Fairfax County's Comprehensive Plan facilitates the reconfiguration and conversion in phases of the quarry located adjacent to the Griffith Water Treatment Plant to a future water supply storage facility. On June 2, 2015, Fairfax Water and the quarry operator received zoning approvals for this action. The quarry water supply storage facility will help to provide additional water supply storage and to reduce dependency on the Potomac River during drought periods.

3. Fairfax Water provides highly advanced drinking water treatment for its customers. It tests raw water, treated water and tap water for water quality assurance. Its treatment facilities and distribution system are well maintained. Fairfax Water has begun a comprehensive system reliability project to protect its system from future vulnerabilities. The project includes additional storage, as well as back-up power for major facilities.
4. Lifting the 1982 Ban on Uranium Mining could potentially threaten the Occoquan water supply.
5. Given the unpredictability of rainfall patterns in recent years, the lack of a well-documented scientific basis for a low flow regime for the Potomac River during drought conditions should be addressed as part of the drought resiliency planning in order to assure adequate protection for both the Potomac River ecosystems and adequate planning for regional water supplies.

III.B. WASTEWATER

INTRODUCTION

Wastewater is primarily treated in two ways in Fairfax County. In most cases, it is collected from homes and commercial sites and carried through the sanitary sewer pipe system (maintained by Fairfax County) to five large treatment facilities (Fairfax County's own Noman M. Cole Jr., Pollution Control Plant, Upper Occoquan Service Authority, DC Water's Blue Plains Advanced Wastewater Treatment Plant, Alexandria Renew Enterprises, and Arlington Water Pollution Control Plant) that release the treated waters into local waterways. And about 20,000 gallons per day of the county's wastewater is treated at the Prince William County Service Authority. The only small treatment plant remaining in the county serves the Harborview subdivision of Mason Neck.

CURRENT STATUS

Treatment Overview

The treatment of sewage is a complex and shared responsibility among jurisdictions. Of the 100 million gallons per day (mgd) collected daily through the sanitary sewer system, approximately 40 percent is treated by the county-owned Noman M. Cole, Jr. Pollution Control Plant (NMPCP) in Lorton, Virginia. The remaining 60 percent of the wastewater is conveyed for treatment, under inter-jurisdictional agreements with the District of Columbia Water and Sewer Authority (DC Water) (approximately 30 percent), the Upper Occoquan Service Authority (UOSA—13 percent), Alexandria Renew Enterprises (15 percent), and Arlington Water Pollution Control Plant (two percent). The combined Fairfax County allocated capacity of these five treatment plants is 157 mgd (which includes one mgd reserved capacity with Loudoun Water's Broad Run Treatment Plant). Fairfax County pays a pro rate share of the cost of these facilities. Fairfax County has representatives on all of these facilities governing boards.

Wastewater produced within the ASSA (an approved sewer service area), which covers approximately 290 square miles of the total 400 square mile Fairfax jurisdiction, is conveyed by the county's 3,380-mile-long collection system. The collection system delivers wastewater to the above mentioned five advanced wastewater treatment plants (designed for nutrient removal) located in the metropolitan area. Two of the five treatment facilities are located in Fairfax County: the Fairfax County NMPCP and the independent UOSA. For an overview, access the following website:
<https://www.fairfaxcounty.gov/publicworks/sites/publicworks/files/assets/documents/wastewater-annual-report.pdf>.

The Wastewater Management Program within the county is managed as an enterprise fund which means the fees collected for hookups and for service fund the system. The Board of Supervisors sets the fee rate.

For approximately 5% of Fairfax County residents, wastewater is treated on-site via septic systems through which the water infiltrates into the ground and ultimately reaches groundwater.

Fairfax County Noman M. Cole Jr. Pollution Control Plant (NMCPCP)

The NMCPCP, located in Lorton, Virginia, is a 67 mgd advanced wastewater treatment facility that incorporates preliminary, primary, secondary, and tertiary treatment processes to remove pollutants from wastewater. The plant is owned and operated by the Fairfax County Department of Public Works and Environmental Services Wastewater Division. The original plant, which began operation in 1970 at a treatment capacity of 18 mgd, 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 Noman Cole Plant continues to more than meet the performance standards for the limits of parameters monitored. Additional information is available on the Fairfax County website: <https://www.fairfaxcounty.gov/publicworks/wastewater/noman-m-cole-jr-pollution-control-plant>.

This advanced treatment facility for wastewater in Fairfax County should be commended for its leadership in producing treated water for reuse. The facility's YouTube video does an excellent job of explaining the process: www.youtube.com/watch?v=UdddK1YcFK8. This water can be safely used to water lawns, in commercial car washing businesses, in construction and for other industrial uses.

The Water Reuse Project uses clean wastewater from the Noman M. Cole Jr. Pollution Control Plant for irrigation and industrial purposes. This program reduces 1 mgd of drinking water need within the county. We use 0.25 mgd onsite as well. This equals a savings of 2BG treated water annually. A pipeline was installed from the plant in Lorton to: Covanta Fairfax, Inc. Resource Recovery Plant; the Laurel Hill Golf Course; and South County ball.

Maintenance of the Noman Cole Plant and the Conveyance System

The Wastewater Collection Division (WCD) of the Department of Public Works and Environmental Services is responsible for: the operation and maintenance of the sewers, force mains, pump stations and metering stations; maintaining the asset management system program; and overseeing the planning, design, and construction of Capital Improvement Program (CIP) projects.

1. The Gravity Sewer Branch's (GSB) cleaning and maintenance program includes tracking, scheduling, and conducting routine inspection and/or cleaning of line segments. Greater efforts in sewer inspection and cleaning activities result in decreasing the number of preventable overflows and backups in the system. Fairfax County gravity sewers consistently have fewer occurrences of backups

and overflows than the median level, established in a study conducted by the American Water Works Association and Water Environment Foundation (WEF), and occurrences of backups and overflows were below the 25th percentile for each of the last five fiscal years. The general trend is that occurrences are infrequent events due to the county's aggressive maintenance and rehabilitation program. These backups often occur because of restaurants who do not maintain their grease control and residents who put grease and oil down the drains. GSB is also responsible for managing the county's septage pump and haul operations that service the septic systems that are not working.

2. The CCTV (closed circuit television) Group's primary function is to detect defects in the sanitary sewer system using specialized CCTV equipment and make repair recommendations. Once these defects are identified, recommendations for their repair are made. The new trenchless technologies provide significant cost savings over traditional open cut repairs, with the additional benefits of reduced disruption to residents, the surrounding environment and traffic.
3. The WCD flow metering program is a vital operation in monitoring and recording wastewater flows entering and leaving the county. In FY 2017, WCD completed replacing outdated communication equipment in all flow metering stations with a 3G communication technology system.
4. The Pump Station Branch (PSB) is responsible for the operation, maintenance, repair, and rehabilitation of the county's pump stations, metering stations, and force mains. The pump stations' supervisory control and data acquisition (SCADA) system provides remote monitoring, alarm management, and limited control capabilities for the pump stations on a Local Area Network (LAN). The PSB also maintains 60 backup power generators, located at pumping stations throughout the county service area, in order to ensure continuation of wastewater pumping and flow during power outages.

Fairfax County's Pretreatment Program

Fairfax County had recognized the need for an effective, enforceable pretreatment program to protect the county's wastewater collection, conveyance, and treatment infrastructure against interferences, and to prevent pollutants of concern and potential other industrial pollutants from passing through the wastewater treatment facilities to receiving surface waters. The Pretreatment Program is in full compliance with all applicable pretreatment requirements. For an overview of the program please see: <https://www.fairfaxcounty.gov/publicworks/wastewater/industrial-waste-pretreatment>.

Information Septic Systems and Pump and Haul

Over 21,000 homes and businesses are served by onsite sewage disposal systems in Fairfax County. About 5% of these systems are alternative sewage disposal systems, which require more extensive maintenance than conventional systems. All septic systems are required to be pumped out every five years. The operation and maintenance of all onsite sewage disposal facilities is

regulated by the county's Health Department.

Permits are issued for residents to utilize pump and haul as a result of a failing onsite sewage disposal system. About 195 homes in the in Town of Clifton and the Gunston and Wiley communities are on pump and haul. In order to meet the needs of residents and commercial building operators, the Fairfax County Health Department continues to work with the public to evaluate and assess whether conventional, alternative, or public sewer disposal systems are best suited for each property.

Upper Occoquan Service Authority (USOA)

UOSA is an independent authority that operates an advanced water reclamation facility in Centreville, Virginia and serves the western portions of Fairfax and Prince William counties, as well as the cities of Manassas and Manassas Park. A video, Drinking Water UOSA Drinking The Water Final Map Video on Vimeo shows individuals comfortably drinking the treated water from the plant and showcases the high degree of treatment. This system was one of the early pioneers of indirect potable reuse in the country. UOSA discharges directly into the Occoquan Reservoir. UOSA continues to meet its performance criteria. Additional information can be found on the USOA website: <https://www.uosa.org/IndexUOSA.asp> Shahram Mohsenin, Director of the Wastewater Planning and Monitoring Division at Fairfax County, serves as the chair of UOSA Board.

Monitoring the Success of Improved Treatment

The Occoquan Watershed Monitoring Laboratory (OWML) has administered a comprehensive hydrologic and water quality monitoring program in the Occoquan Watershed since 1972. The program is jointly funded by Fairfax Water and the six jurisdictions within the watershed. OWML operates nine automated stream monitoring and flow gauging stations located on the major tributary streams of the watershed. These stations record stream flow and automatically collect flow-weighted composite water samples during storm events. Under base flow (non-storm flow) conditions, samples are collected weekly during the spring, summer and fall seasons, and approximately biweekly in the winter. There are concerns with emerging contaminants and increased sodium and chloride in the Occoquan Reservoir of Directors.

Wastewater Treatment and Gunston Cove Recovery

The improved water quality of Gunston Cove (which receives effluent from NMCPCP), the Occoquan Reservoir (which receives effluent from UOSA) and the Potomac River (which receives effluent from Blue Plains) are testament to the high standards of treatment in the last decades by these facilities.

Since 1984, Fairfax County, with assistance from George Mason University, has been monitoring water quality and aquatic life in the Gunston Cove area. As a major discharger of treated wastewater into the tidal Potomac River from the Noman M. Cole Jr., Pollution Control Plant, Fairfax County has been proactive in decreasing nutrients, a

major cause of water quality impairment, since the late 1970s. Due to the county's commitment to advanced wastewater treatment at the Noman M. Cole Jr., Pollution Control Plant, nitrogen and phosphorus loadings in Gunston Cove have reduced dramatically over the study period. Chlorine and solids in treated water have also been reduced or eliminated. The reduction in loadings has been achieved even as flow through the plant has remained high. Fairfax County has demonstrated how effective wastewater management can improve water quality, and thereby restore the aquatic ecosystem. The Gunston Cove study has proven to be an extremely valuable case study in ecosystem recovery for the Chesapeake Bay region and internationally.

For additional information, see:

<https://www.fairfaxcounty.gov/publicworks/wastewater/gunston-cove>

DPWES Wastewater Management Public Education and Outreach Efforts

The Outreach and Education Program provides support to all divisions of Wastewater Management. For an extensive list of videos and resident help links see:

<https://www.fairfaxcounty.gov/publicworks/wastewater>.

RECOMMENDATIONS

- 1. Set the fee rate collected for wastewater treatment to meet the documented needs of the necessary upgrades and maintenance requirements for all the plants that serve the county and their respective wastewater collection system.**

Recommendation: 3BW- 2021.1 | Status: New this year

Justification and Background:

The Noman M. Cole Jr., Pollution Control Plant has been a leader in sewage treatment due to significant upgrades throughout the years.

<https://www.hazenandsawyer.com/publications/trigger-based-utility-planning-capital-expenditure-timing-analysis-for-norm/>. But the collection system which includes 63 wastewater pumping stations, two stormwater pumping facilities, one water reuse system, 57 permanent flow metering stations, 11 rain gauge stations and 135 grinder pump and associated pressure sewer systems is aging. The costs for replacement of older infrastructure and increased maintenance have risen. In February of 2014, the Wastewater Management Program (WWM) Asset Management Team was formed to develop a dynamic asset management program for prioritizing and optimizing the operation, maintenance and capital asset reinvestment of the linear assets. Several phases of the of the Asset Management program have been complete.

[http://midatlantic.apwa.net/Content/Chapters/midatlantic.apwa.net/File/New%20folder%20\(9\)%2F2020-10-08%20SFatah%20Fairfax%20County%20WCD%20AMP%20APWA.pdf](http://midatlantic.apwa.net/Content/Chapters/midatlantic.apwa.net/File/New%20folder%20(9)%2F2020-10-08%20SFatah%20Fairfax%20County%20WCD%20AMP%20APWA.pdf)

However, there was no rate increase in FY 2021 and only an insufficient increase in FY 2022 in the rate required to keep the maintenance and replacement on schedule which leaves the program underfunded.

- 2. Continue aggressive public education and monitoring of the new alternate septic systems performance is necessary.**

Recommendation: 3BW-2021.2 | Status: New this year

Justification and Background:

Areas of the county with marginal or highly variable soils that have been deemed unbuildable in the past are now being considered for development using alternative onsite sewage disposal technology. These alternative systems are also becoming the norm for developers who want to maximize lot yield from properties. Alternative systems require more aggressive maintenance on a regular schedule for the systems to function properly. Some require maintenance contracts as part of the permitting process. Homeowners may not be aware of their responsibilities for maintaining these systems. Education from the private sector and government sector, including both Fairfax County Department of Public Works and Environmental Services and the Health Department, is essential to prevent a high failure rate of the new more complex systems.

COMMENTS AND CONCERNS

1. EQAC commends the Water Reuse Program and encourages extending the program when possible.
2. Monitoring by the Occoquan Watershed Monitoring Lab on the reservoir and by George Mason on Gunston Cove should continue. The over 15-year lag time between water quality improvement in the treated water at the Noman M. Cole Jr., Pollution Control Plant and the recovery in Gunston Cove is a cautionary tale on the necessity of long-term monitoring and realistic expectations for the time it takes for biological systems to recover.

III.C. IMPROVING WATER QUALITY, RESTORING NATURAL SYSTEMS, MANAGING STORMWATER AND PROTECTING INFRASTRUCTURE

INTRODUCTION

Stormwater management is the art and science of managing the damaging effects of polluted and excessive runoff on our natural environment (streams, ponds, lakes, and rivers) and on our built environment (bridges, roads, and buildings). This is achieved by attempting to manage both the quality and quantity of water running off of our developed lands.

Unlike drinking water and wastewater treatment processes, it is an emerging science with changing understandings and solutions, see: www.youtube.com/watch?v=PiLQyFy7Pg.

The diffuse and intermittent nature of stormwater makes runoff pollution difficult to control. Polluted runoff consists of nutrients, including nitrogen and phosphorus (organic matter, fertilizer), which can stimulate excessive algal growth in ponds, streams, and

rivers. Other runoff pollutants are sediment (from erosion, construction sites, eroded stream banks and road sand), toxics (from oil, paint, pesticides, chemicals, and metals), pathogens including bacteria (such as animal waste, failing septic systems and leaking sewer systems) and trash. In areas with buildings, roads and parking lots, the water flows over these surfaces into storm drains. Anything that goes down a storm drain goes directly to the nearest stream.

Historical Perspective

As development and redevelopment occur, 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, the amount of stormwater runoff increases and flows into streams more quickly. Increased, uncontrolled runoff causes stream erosion, resulting in scouring, downcutting and over-widening of stream channels and loss of streamside vegetation. When stream channels become incised from downcutting, 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. Loss of shade results in increased water temperatures. During summer storms, runoff from heated impervious surfaces also raises water temperatures.

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 lead to habitat loss, water quality problems and damage to homes, utilities, and infrastructure. Collectively, this phenomenon is known as “urban stream syndrome” and is typical of many Fairfax County streams.

Figure III-2: Healthy Stream Components



Figure III-3: An Unhealthy Stream

Photos provided by the Fairfax County Department of Public Works and Environmental Services.

Stormwater runoff is treated by either constructing facilities that capture the rainfall on site and infiltrate it into the ground or by conveyances and facilities that carry the water off site to facilities that treat and release the water into streams or lakes. **The purpose of stormwater management is to manage both the quality and quantity of water coming off sites because of increased impervious surfaces. Stormwater management removes pollutants and controls volume to reduce flooding and the erosive quality of increased water flow on stream banks and bottoms.**

Stormwater management requires a complex integration of public and private facilities, differing choices for restoration and protection of streams, ongoing inspections and maintenance for all facilities and public education and involvement in handling runoff. Enforcement and enhancement of regulations based on current science to reflect future conditions to minimize impacts on our streams and ecosystems should be pursued. It requires inspections of development sites for adequate stormwater protections. Imperative in all this is monitoring the effectiveness of facilities and treatments in protecting natural and built conveyance systems and improving water quality.

The results of these combined efforts should lead to healthier, protected, and restored streams, and increased resilience from the more frequent intense storm events accompanying climate change. These efforts result in a cleaner Occoquan Reservoir, healthier Potomac River, and ultimately, an improved Chesapeake Bay ecosystem.

CURRENT STATUS

Monitoring

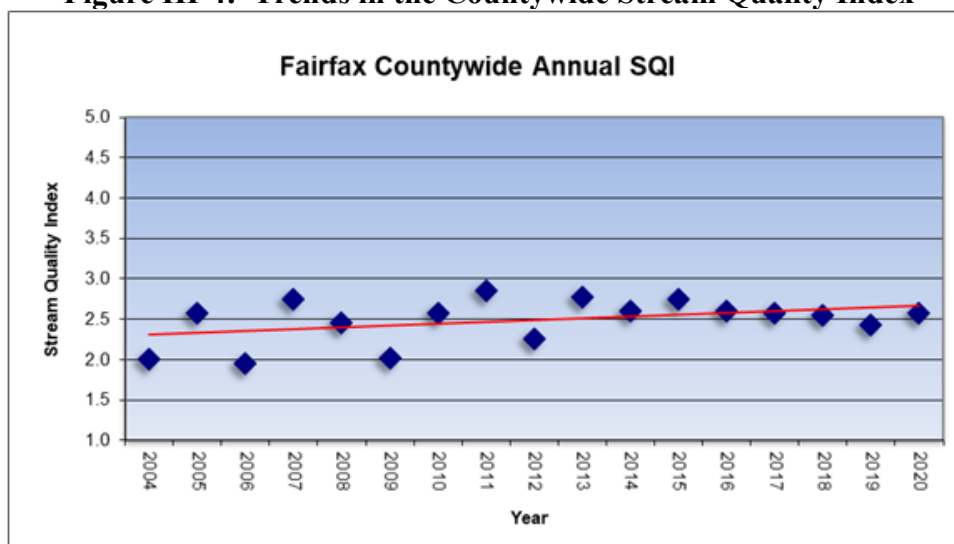
Monitoring Streams

The Fairfax County Department of Public Works and Environmental Services (DPWES), Fairfax County Park Authority (FCPA), Virginia Department of Environmental Quality (DEQ), U.S. Geological Survey (USGS) and local water treatment plants and other organizations regularly conduct water quality monitoring and testing. The Northern Virginia Soil and Water Conservation District (NVSWCD) also collects monitoring information through its volunteer water quality monitoring programs. All of these data help provide a comprehensive understanding of the condition and health of Fairfax County's water resources. The county collects both system-wide and specific watershed data; the county also collects data that focuses on some specific stormwater treatment methods to monitor their effectiveness.

- **DPWES – Stormwater Planning Division Monitoring Programs: Stream Quality Assessment Program** – borne from the 2001 Stream Protection Strategy Baseline, this program has been assessing conditions in the streams of Fairfax County annually. This comprehensive monitoring program uses a statistically valid methodology called probabilistic monitoring to annually evaluate the physical, chemical, and biological conditions of streams. For additional information, see: <https://www.fairfaxcounty.gov/publicworks/stormwater/stream-quality-assessment-program>.

For almost two decades, this biological monitoring effort continues to indicate that approximately 75% of the county's waterways are considered to be in "Fair", "Poor", or "Very Poor" condition. However, Fairfax County streams have shown a slight amount of improvement since 2004, when the current monitoring program began. Although the changes have been relatively minor, it is important to note that they have occurred against a backdrop of continued urbanization and population growth.

The Stream Quality Index (SQI) is based on annual data collected on resident populations of stream benthic macroinvertebrates. As benthic macroinvertebrates are excellent indicators of water quality, the SQI is used to evaluate long-term trends in the overall health of streams. Over the last four years, the countywide annual SQI score has leveled out at a score of around 2.6 (Figure III-4).

Figure III-4: Trends in the Countywide Stream Quality Index

Source: Department of Public Works and Environmental Services, September 2021

- **The bacteria monitoring program** provides information on the general levels of bacteria in streams and is used as a screening tool that can identify areas of concern for further, more intensive investigations of potential sources (e.g., sewer leaks). In addition, the potential human health risk associated with wading or swimming in streams is assessed based on analyses of *E. coli* bacteria found in streams. Based on these results, recreational direct contact with surface waters is discouraged and additional information can be viewed online at: <https://www.fairfaxcounty.gov/health/pools/swimming-natural-waters>.
- **The Stream Protection Strategy Baseline Study**, published in 2001, provides a holistic initial ecological baseline assessment of county streams and management recommendations. The Stream Protection Strategy Baseline Study can be obtained by going to: www.fairfaxcounty.gov/publicworks/stormwater/stream-protection-strategy-baseline-study.
- Completed in 2004, the **Stream Physical Assessment** study provided baseline field reconnaissance data including information on habitat conditions, impacts on streams, general stream characteristics and geomorphic classification of stream type. This information was used as the basis for the development of countywide Watershed Management Plans. The county has recently developed an updated stream physical assessment methodology. This ongoing program is being used to identify areas of need and opportunities for restoration, enhancement, protection, and management. More information can be found here: <https://www.fairfaxcounty.gov/publicworks/watersheds/>.

- The **U.S. Geological Survey (USGS) watershed study partnership** was established in 2007 as a collaborative, long-term trend study to evaluate watershed scale changes in water quality and quantity in response to the large-scale implementation of watershed capital improvement projects (e.g., stream restorations, stormwater management retrofits, green infrastructure, etc.). This is accomplished through a network of jointly operated stream gages that collect high-density monitoring data throughout the county. To date, two extensive reports have been published from this study and a third report is expected in 2022. Please visit the project web page for data, reports, maps, and ancillary studies related to this state-of-the-art monitoring program: <https://va.water.usgs.gov/fairfax>.

Citizen Volunteer Monitoring Programs

The Northern Virginia Soil and Water Conservation District certified site leaders monitor 28 sites, three to four times annually. The Reston Association (RA) monitors another 12 sites in the Difficult Run watershed and additional information can be viewed online at: <https://www.reston.org/streams>.

Pond and Lake Monitoring

Since 2014, four large, county-managed water control impoundments in the Pohick Creek watershed have been monitored by DPWES. These lakes (i.e., Barton, Huntsman, Woodglen and Royal) were built in the 70s and 80s by NVSWCD and Fairfax County as flood and sediment control facilities as part of the federal Public Law – 566 program. The objective of the monitoring is to evaluate the effects of periodic dredging on lake conditions and to provide scientific data on best management practices for these lakes. The study is ongoing and preliminary findings will be shared on a web page that is currently under development.

The Reston Association, the homeowner’s 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. This report and other information about Reston’s lakes can be obtained from: www.reston.org/lake-report.

WATERSHED MANAGEMENT AND RESTORATION

Watershed Management Plans

Between 2003 and 2011, a total of 13 watershed management plans, which cover all 30 county watersheds (www.fairfaxcounty.gov/publicworks/stormwater/watersheds), were developed and adopted by the Fairfax County Board of Supervisors. From this planning effort, more than 1,700 structural and non-structural projects were proposed to help restore and protect our vital natural resources.

Fairfax County Watershed Projects and Stream Restorations

Recent data suggest that the most effective cost of achieving nutrient (total nitrogen and total phosphorous) and sediment reduction goals (total suspended solids) is through

stream restorations. The county has completed 174 stormwater projects and restored over 82,000 linear feet of degraded streams since July 2009. The county often leverages resources and has obtained over \$21 million in grant funding from the Virginia Department of Environmental Quality through the Stormwater Local Assistance Fund (SLAF) for 21 projects.

Clean Water Act designated impaired streams and Total Maximum Daily Loads (TMDLs)

Many bodies of water in Fairfax County have been designated as being “impaired” under the federal Clean Water Act. For each of these bodies of water, a “Total Maximum Daily Load” (TMDL) must be prepared in order to identify pollutant load reductions that would be needed to remedy the impairment. To date, several TMDLs have been established for streams and embayments in the county. Impairments identified include bacteria (fecal coliform and/or *E. coli*); sediment (benthics); polychlorinated biphenyls (PCBs) and chloride. For a list of current TMDL action plans, which include the impaired waters associated with each pollutant, see:

<https://www.fairfaxcounty.gov/publicworks/stormwater/municipal-separate-storm-sewer-system-ms4-permit>

Reston Stream Mitigation Bank

Beginning in 2008, over 11 miles of streams in Reston have been restored as part of a private stream mitigation bank. This is an ongoing project independent of county efforts. Additional information can be viewed online at: <http://reston.wetlandstudies.com>.

Flood Remediation/Reduction Programs in Belle Haven and Huntington

Since 2003, several communities in the eastern portion of Fairfax County have been damaged by significant floods. In 2019, the 2,800-foot Huntington levee was completed to protect the community from flooding. The Climate and Energy chapter of this Annual Report on the Environment addresses these concerns from the perspective of climate resiliency and adaptation. Information about the projected can be obtained by going to: <https://fairfaxcounty.gov/publicworks/huntington-levee>.

Stormwater Management Facilities and Infrastructure Maintenance and Repair

There are over 7,000 stormwater management facilities in Fairfax County’s inventory. Much of the inventory consists of manufactured (proprietary) devices, infiltration trenches, underground and rooftop detention facilities and sand filters. Other practices like bioretention gardens, swales, tree filters, permeable pavement and green roofs are referred to as green stormwater infrastructure (GSI). GSI requires a greater level of maintenance to ensure functionality. The county inspects county-owned structures biannually and public ones ever five years. These inspection rates are consistent with the Municipal Separate Storm Sewer System (MS4) program requirements. The Maintenance and Stormwater Management Division (MSMD) performs preventative maintenance on county-maintained stormwater facilities and inspections of 20 state regulated dams that

are operated by DPWES. Critical items such as the stability of the dam embankment and the function of the water control structures are addressed on a priority basis. Routine items such as mowing are scheduled seven times per year. More information can be found at the DPWES website: <https://fairfaxcounty.gov/publicworks/stormwater/dam-basics>.

The county's storm drainage systems, valued at more than \$1 billion, include over 1,400 miles of pipes and almost 64,000 storm structures, some up to 80 years old. MSMD continued implementation of its storm drainage condition assessment program consistent with the MS4 program requirement to inspect 100 percent of the county's storm drainage system every five years and at least 15 percent annually. Restoration and rehabilitation of the system is ongoing. Information pertaining to the MS4 Program Plan and annual reports can be found at: <https://www.fairfaxcounty.gov/publicworks/stormwater/ms4-program-plan-and-annual-reports>.

Erosion and Sediment Control Inspections, Stormwater Compliance Inspections
Erosion and sediment control (E&S) permits are issued by Fairfax County, authorizing disturbance of acres of land each fiscal year. During that time period, E&S inspections and stormwater inspections occur. E&S violation notices and stormwater violations are issued. They are usually resolved.

Virginia Department of Transportation Stormwater Treatment

Nearly 1,000 acres of impervious road surface area runoff are treated through a system of more than 200 stormwater basins and other measures throughout the county under the Virginia Department of Transportation's (VDOT's) Virginia Pollutant Discharge Elimination System (VPDES) General Permit (for discharge of stormwater from small MS4s within the urbanized areas of Virginia). Total maximum daily loads (TMDLs) have been developed for sediment, nitrogen, and phosphorus by the Virginia Department of Environmental Quality.

PUBLIC OUTREACH AND SUPPORT PROGRAMS

Fairfax County DPWES Stormwater Planning Division Programs

The county has numerous, award-winning watershed education and outreach programs and materials that are regularly utilized by the Fairfax County public school system and others. These programs include the Revitalize Restore, Replant! Program (R3), Stormy the Raindrop education campaign and Create a Caddisfly (for our younger residents), and the Stream Crime Investigation (SCI) and geomorphology labs designed for high school students. More information about these and many other programs can be found on the Watershed Education and Outreach website: www.fairfaxcounty.gov/publicworks/stormwater/watershed-education-and-outreach

The county has numerous web pages and handouts on dam safety, careful fertilizer use, preventing polluted stormwater runoff, etc. and is developing a manual for homeowners on maintaining their own private stormwater facilities.

ORGANIZED WATERSHED CLEANUPS

Staff from the Stormwater Planning Division, Solid Waste Management Program, Wastewater Management Program, Fairfax County Park Authority and the Northern Virginia Soil and Water Conservation District support large and small-scale volunteer cleanups coordinated by the Alice Ferguson Foundation, Clean Virginia Waterways and Clean Fairfax.

In 2019 a new partnership was initiated between DPWES and the Office to Prevent and End Homelessness (OPEH) to benefit the environment and provide assistance for individuals experiencing homelessness. **Operation Stream Shield** provides part-time, temporary work experience to guests of four of the county's homeless shelters to help improve the water quality of local streams. The program helps the county meet its mandate to keep streams clean through the removal of litter and non-native invasive plant species, maintenance of the county's pedestrian trail system, providing assistance to the county's Noman M. Cole, Jr., Pollution Control Plant, I-66 Transfer Station, and the I-95 Landfill Complex, and engaging in assigned special projects as they become available. For more information, see:

<https://www.fairfaxcounty.gov/publicworks/operation-stream-shield>

Northern Virginia Soil and Water Conservation District Support Programs

- 1) Review and approve Soil and Water Quality Conservation Plans (SWQCPs) to renew existing Agricultural and Forestal (A&F) Districts.
- 2) Assist homeowner associations, civic associations, and places of worship in resolution of drainage and erosion concerns as well as the promotion of energy efficient practices. Also, provide ongoing technical assistance to private property owners with funding from the Virginia Conservation Assistance Program and the Conservation Assistance Program to implement the proposed water quality solutions.
- 3) Organize storm drain marking efforts with colorful and watershed-specific labels stating, "No Dumping, Drains to [the nearby stream]."

RECOMMENDATIONS

1. **EQAC recommends that those policies and ordinances protecting streams, floodplains and designated Environmental Quality Corridors (EQCs) should remain unchanged or be enhanced. The protection of environmental assets is an essential part of resiliency planning in the face of climate change.** The county has evolved a series of policies and ordinances to protect receiving waters, stream valley lands and other environmental assets - the Floodplain Regulations of the Zoning Ordinance, the Environmental Quality Corridor policy of the Comprehensive Plan, the Chesapeake Bay Preservation Ordinance, the Occoquan Reservoir protections, and the Stormwater Management Ordinance.

Recommendation: 3CW-2021.1 | Status: New this year

Justification and Background:

The county has had, for several decades, ordinance requirements and Comprehensive Plan policies that, collectively, support the protection and restoration of ecologically valuable stream valley areas throughout the county. These sensitive areas include floodplains and wetlands along streams, as well as steeply sloping areas near streams and floodplains. Where the aforementioned features are narrow in extent, they also include additional natural buffer areas along streams meeting defined minimum widths.

The county's Zoning Ordinance has included floodplain requirements in some form since adoption of the 1959 Zoning Ordinance. The current regulations substantially limit the nature and extent of uses that may occur within 100-year floodplains of streams in the county. The Use Limitations of the Floodplain Regulations establish that any such uses will occur in a manner that will be protective of upstream and downstream properties, that structures that will be provided within the floodplain will be designed sensitively in light of flood risk and that the uses should meet environmental goals and objectives in the Comprehensive Plan.

The county's Comprehensive Plan contains a number of environmental policies, most notably the Environmental Quality Corridor (EQC) policy. This policy, which was initially adopted by the Board of Supervisors in 1975 and which has been refined since that time, supports a Comprehensive Plan objective to "identify, protect and enhance an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County." The EQC policy is not an ordinance requirement, but it has been effective in protecting sensitive lands through commitments made and through conditions imposed during the county's zoning process. Additional information on the Environment section of the Policy Plan can be accessed through the county website at: <https://www.fairfaxcounty.gov/planning-development/sites/planning-development/files/assets/compplan/policy/environment.pdf>.

The Chesapeake Bay Preservation Ordinance was initially adopted by the Board of Supervisors in 1993 to satisfy a requirement of Virginia's Chesapeake Bay Preservation Act and associated Chesapeake Bay Preservation Area Designation and Management Regulations. The ordinance establishes criteria for the designation of Chesapeake Bay Preservation Areas, including Resource Protection Areas (RPAs—along all perennial streams within the county and including certain 100-year floodplains) and Resource Management areas (RMAs—all other areas). Allowed and exempted uses and development in RPAs are limited, although exception provisions are available allowing for case-by-case consideration of relief from these limitations.

The ordinance also contains performance criteria governing those uses that are allowed within RPAs as well as uses within RMAs.

The areas draining to the Occoquan drinking water reservoir have been protected through enhanced water quality regulations and land use requirements since the early 1980s. The Water Supply Protection Overlay District (WSPOD) established these protections, which include strict stormwater controls on over 63,000 acres. As pressures on the watershed increase, it is imperative that these protections are kept relevant to the current challenges facing water quality in the reservoir. Please see the Drinking Water section of this chapter for additional information.

The Fairfax County Stormwater Management Ordinance (Chapter 124 of the County Code) ensures the general health, safety, and welfare of the residents of Fairfax County and protects property, state waters, stream channels, and other natural resources from the potential harm of illicit discharges of pollutants and unmanaged stormwater by establishing requirements for managing stormwater. This Chapter establishes a local stormwater management program that is administered in conjunction with the county's Municipal Separate Storm Sewer System (MS4) program and erosion and sediment control program. As stormwater science and management technologies evolve, these will need to be reflected through updates to this ordinance. For example, the county should evaluate if Chapter 124 can be modified to account for climate change by strengthening requirements for developers adding impervious surfaces. Such modifications should seek to prevent increased runoff volume to downstream communities beyond what is achieved with current regulations.

These regulations and policies have supported the creation of stream valley parks and stream valley trails and support the attainment of goals established within the county's watershed management plans. These protections should remain in place. As we attempt to address resiliency issues and climate change impacts, it may be necessary to strengthen, enhance, and/or update some of these policies and regulations.

2. **EQAC recommends that the funding for the stormwater Program be increased either by an increase in the Stormwater Service District rate in FY 2023 by at least one-quarter penny, from a rate of 3.25 cents per \$100 assessed real estate value to 3.50 cents per \$100 or that the increase occur through a change in the tax rate.**

Recommendation: 3CW-2021.2 | Status: Recurring request

EQAC commends the Board of Supervisors for its actions of the past years, initially authorizing one penny of the real estate tax to be dedicated to the stormwater management program in FY 2006 and establishing a Stormwater Service District in FY 2010 that is currently funded at 3.25 cents per \$100 of assessed real estate value. Stormwater funding has increased from the original amount of \$17.9 million for FY 2006 to \$86 million for FY 2022.

Justification and Background:

The Board of Supervisors' actions to provide for annual quarter cent increases in the Stormwater Service District Tax rate have allowed the county's stormwater program to increase stormwater infrastructure replacement, create a more comprehensive low impact development maintenance program and rehabilitate a number of older stormwater management dams as well as other critical components. The last rate increase from 3.00 cents to 3.25 per \$100 of assessed real estate value occurred in FY 2019. The inventory of stormwater infrastructure continues to grow by approximately 500 stormwater management facilities and eight miles of pipe per year. In addition, much of the stormwater infrastructure in Fairfax County is reaching the end of its life cycle, and as the system ages it remains critical to maintain adequate inspection and rehabilitation programs to avoid infrastructure failures and ensure the functionality of stormwater treatment systems. It is also critical for the stormwater program to implement cost effective solutions such as trenchless pipe rehabilitation technologies, naturalized stormwater management facilities and partnerships with other county agencies such as Fairfax County Public Schools and the Fairfax County Park Authority to help protect and improve local streams. Additional funding is needed for maintenance dredging of Lake Accotink and other publicly maintained lakes to sustain their environmental and recreational benefits.

In addition to supporting infrastructure reinvestment, the capital program funds critical capital projects from the watershed management plans including flood mitigation projects; stormwater management pond retrofits; implementation of low impact development techniques; and stream restoration projects. It is important to note that these projects are necessary to address current community needs, mitigate the environmental impacts of erosion and comply with the county's MS4 permit. The benefits of these projects include reducing property damage due to flooding and erosion; reducing excessive sediment loading caused by erosion; improving the condition of streams; and reducing nutrient and sediment loads to local streams, the Potomac River, and the Chesapeake Bay.

Older suburban neighborhoods that were developed before the establishment of effective stormwater management regulations, including the requirements of stormwater conveyance, detention, and overland relief, may experience storm drainage issues. Lot-by-lot residential infill redevelopment, where an existing home is replaced by a larger home with more impervious area, generates additional stormwater flow that impacts the already inadequate stormwater management system. Over the next century, precipitation events are expected to become more intense, which could lead to more frequent flooding. Additional funding is needed to address neighborhood drainage improvement projects to reduce localized flooding and obtain water quality benefits in older neighborhoods that were developed without or limited stormwater management controls.

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IV. WASTE MANAGEMENT

Board of Supervisors' Environmental Vision:

“Fairfax County will use integrated waste management principles to ensure future system capacity and sustainability. The objectives are an increase in the recovery of recyclable materials; a decrease in the amount of material disposed of; a decrease in greenhouse gas emissions by managing landfill gas; development of renewable energy and alternative fuels for buildings and vehicles; and preservation of open space, green space, and wildlife preserves.”

INTRODUCTION

This chapter provides an overview of the county's solid waste management system and discusses a range of waste management issues as follows:

- Components of the county's system;
- Solid Waste Management Program (SWMP) Overview;
- Current status for key issues;
- Recommendations to realize board's Environmental Vision.

Components of the Solid Waste Management Program (SWMP)

The six components of the SWMP are described below.

- *Source Reduction* aims at reducing waste generation and lessen the environmental impacts associated with waste.
- *Reuse* encourages using items multiple times for its original purpose or different function.
- *Composting* diverts brush, grass, and leaves from disposal to produce compost that can be added to soil to help plants grow.
- *Recycling* **target** materials include glass, paper, cardboard, metal, plastic, tires, motor oil, and electronics.
- *Collection and Transfer* containerized refuse collection from residents, businesses, and institutions is consolidated into larger, tractor-trailer loads at a transfer station.
- *Refuse Disposal* in Fairfax County takes place primarily at the *Covanta* facility described below. The remaining ash after energy recovery is processed to remove metals, stabilized to prevent leaching of toxic components, and landfilled at the I-95 Landfill Complex. When Covanta is non-operational for repairs and maintenance, or any other reason, refuse is transported to one of several contracted landfills.

SWMP Operations Overview

SWMP's Operations Division oversees the collection, transfer, and disposal of solid waste and recyclables within the county. There are two county-owned disposal facilities; the I-66 Transfer

Station and the I-95 Landfill Complex. Most of Fairfax County's Municipal Solid Waste (MSW) is processed from Waste-To-Energy (WTE) at the WTE facility owned by Covanta Fairfax, LLC (Covanta) and is located on the I-95 Landfill Complex. The SWMP also provides collection services to approximately 43,000 single family homes and most county-owned properties and buildings.

- County Sanitary Collection Districts. For about 10% of residents, Fairfax County provides curbside collection services for refuse, recyclables, yard waste, and bulky items within Sanitary Districts (SDs). County residents can petition the county to form a sanitary district and move from privately contracted collection to county collection. Starting in 2019, multiple petitions have been made to the county to form or expand the existing Sanitary collection Districts.
- Outreach & Education. Provided by SWMP, community outreach programs focus on educating residents, county employees, and businesses about the importance of source reduction, reuse, composting, and recycling.
- Household Hazardous Waste (HHW) Drop-off. Locations at the I-66 and I-95 facilities provide a convenient means for residents to dispose of HHW items such as paints, pesticides, herbicides, aerosols, pool chemicals, household cleaners, solvents, fluorescent bulbs, recycle electronics (e-waste), motor oil, antifreeze, batteries cooking oil, ink/toner cartridges, and empty compressed gas cylinders. Additionally, the HHW operation maintains a partnership with Habitat for Humanity to recycle latex paint, and stages Very Small Quantity Generator events as an affordable solution to hazardous waste disposal for Fairfax County businesses and government agencies that generate small quantities of hazardous waste.
- Food Waste Drop-Off Pilot Programs. As a supplement to private-sector firms that offer curbside food waste composting, SWMP has initiated two pilot programs to increase the opportunities for residents to be able to recycle their food scraps.
- Enforcement Program. A standalone SWMP enforcement Unit responds to complaints, conducts scheduled and unannounced compliance inspections, and initiates enforcement actions when necessary on solid waste haulers and litter and illegal dumping. Most of the hauler complaints are for missed collection, collecting too early and for mixing MSW with recycled waste. There were no complaints registered in 2020 for hauler litter.
- Regional Coordination. SWMP staff serve on several industry-related advisory boards and committees with the Northern Virginia Regional Commission (NVRC) and the Metropolitan Washington Council of Governments (MWCOC). This work promotes coordination and collaboration between jurisdictions across the region and promotes shared research and data, and the adoption of best management practices among planners and regulators.

CURRENT STATUS

Recycling

Both commercial firms and residents are required under county code to separate recyclables from their municipal solid waste for recycling. Recycling is not voluntary. Significant data collection and reporting issues were identified for recycled materials in 2020. These issues prevent reliable numeric reporting in this chapter.

Yard waste is the largest share of recycled material, followed by construction demolition debris (CDD). Metals are the next largest material that is processed by local scrap metal processors. Cardboard is principally from commercial office operations and grocery/box store sources. Notably a very small portion of the waste is in the commingled category. Commingled waste is principally the material that residences and businesses source separate for single-stream recycling.

How much residential waste was recycled in 2020?

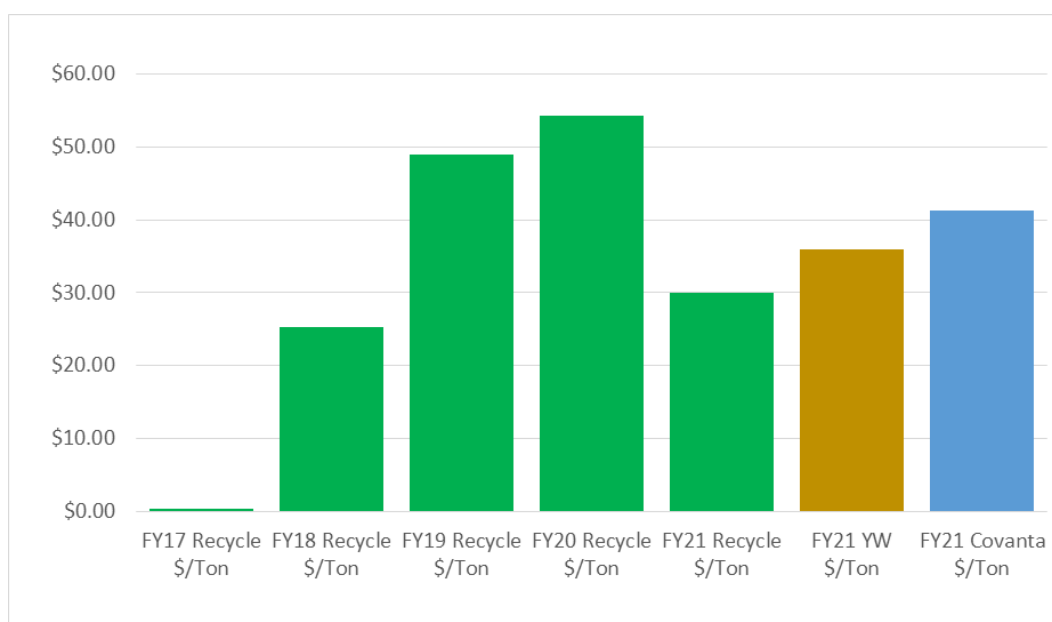
Of the household waste, less than a quarter was recycled in 2020, including the county's glass recycling program.

The commingled category is comprised of single-stream collected materials delivered to private-sector materials recovery facilities (MRFs) and processed into marketable bales of like commodities. The total MSW and recycled materials decreased from 2018 to 2020. However, data indicate that recycled household waste recovered by single stream collection decreased significantly more. Potential reasons for this decrease include the instructions to residences to no longer commingle glass in recycling bins and COVID-19 pandemic impacts.

Recycling is Cheaper

In 2018, China stopped accepting recycled solid waste. As a result, for a short period of time processing and recycling of recycled materials was more expensive than disposal at Covanta. That condition has now reversed and as shown below, the cost of Fairfax recycling disposal is less than Covanta.

**SUMMARY OF ESTIMATED RECYCLING AND DISPOSAL COSTS,
FY 2017 – FY 2021**



Glass

At the I-95 Landfill Complex, SWMP operates a glass recycling system that can process 20 tons of container glass per hour into a variety of products suitable for marketing and/or use.

To date, the purple bin glass recycling program has installed more than 35 drop-off collection containers throughout Northern Virginia. While the program increased glass recycling substantially with 20,000 tons recycled since inception and removing glass from recycling makes the remaining material more valuable, it is still a relatively small portion of recycled household material.



Environmental Impacts

SWMP commissioned a study by consultants to evaluate the environmental impacts of various waste management practices. The study considered power generation offsets, greenhouse gas emissions, costs, social/demographic information, and traffic for the county's current waste disposal practices (i.e., WTE) compared to landfilling.

The study concluded that sending refuse to a local WTE facility and diverting recyclables from disposal play important roles in reducing the greenhouse gas (GHG) impacts of solid waste management, although it is acknowledged that WTE technology generates higher levels of nitrogen oxides (NOx) and sulfur dioxide (SO2) emissions when compared to landfilling.

Covanta is currently installing low NOx combustion system (LNTM) technology to reduce NOx emissions from the facility. The existing contribution of NOx from Covanta is approximately two percent of the total regional emissions. This NOx percentage will decrease to less than 1 percent when the LNTM technology is fully operational in 2022. The study did not compare Covanta SO2 emissions to regional emissions because the Washington, DC-Maryland-Virginia area (including Fairfax County) is in attainment of the SO2 National Ambient Air Quality Standard.

Environmental Preferable Purchasing

The Department of Procurement and Material Management (DPMM) manages the Environmental Preferable Purchasing (EPP) Policy through the Green Purchasing Program. While the DPMM has invested considerable time and effort in communicating the county goals to county departments, it is difficult to track actual progress as there are no numeric criteria.

Litter and Illegal Dumping

There are multiple volunteer organizations addressing litter including the Alice Ferguson Foundation and Clean Fairfax. In addition, the Department of Code Compliance (DCC) receives

and investigates code complaints covering a wide range of issues, including zoning complaints, signs, noise, lighting, and illegal dumping. DCC actions can address specific code violations. However, the county's streams continue to have trash, plastic bag, and bottle contamination. Adjacent is a photo from Little Hunting Creek in Lee District.



Task Force Efforts

- JET- The county's Joint Environmental Task Force is charged with developing a plan to achieve zero waste by 2030. The plan is under development.
- Litter Task Force - The county Litter Task Force is charged with developing recommendations to address litter in the county. This Task Force is suspended as of this writing. One recommendation is to enforce the requirement on waste haulers to keep the area around collection containers clear of litter.

RECOMMENDATIONS

1. Institute Recycling Data Collection and Reporting

Recommendation: 4WM-2021.1 | Age: New this year

Justification and Background:

Data indicate that countywide residential curbside recycling is low. To obtain the cultural change needed to meet the board's goals, the county is encouraged to continue improving outreach, but to also to require private haulers to report to their customers their annual percent of curbside collection that is recycled. In addition, institute outreach requirements and accurate data reporting policies on private waste haulers that result in increased recycling.

2. Institute Litter Control

Recommendation: 4WM-2021.2 | Age: New this year

- Allow the Litter Control Task Force to complete their work *NEW*
- Support Virginia law changes for a container redemption fee ("bottle bill") *Stalled*
- Enforce litter control requirements on Waste Haulers *NEW*

Justification and Background

County streams and public land continue to be impacted by illegal dumping and litter. A multi-agency Litter Task Force has been commissioned to develop recommendations for the board on changes and improvements to the county's current system for investigating, addressing, and remediating litter. However, the task force has been directed to suspend activity pending further direction.

3. Establish Environmental Purchasing Numeric Targets

Recommendation: 4WM-2021.3 | Age: New this year

Justification and Background:

The county has expanded staff to improve environmental purchasing. However, without specific goals and reporting, it is difficult to assess how successful and worthwhile this investment is.

4. Work with Covanta to Reduce Local Air Pollution Impacts

Recommendation: 4WM-2021.4 | Age: New this year

Justification and Background:

Studies conducted for the county indicate that the Covanta method of addressing waste is generally superior to landfilling with respect to GHG. However, there is increased NO_x and emissions from Covanta relative to landfilling. Covanta is proceeding with controls to address NO_x and reduce local air quality impacts. GHG is a global issue. NO_x and SO₂ are local air pollution contributors that potentially impact Fairfax County residents' health.

5. Consider Environmental and Safety Benefits of Sanitary Districts Petitions

Recommendation: 4WM-2021.5 | Age: New this year

Justification and Background:

There are environmental and safety benefits of having a single hauler for a neighborhood.

V. PARKS AND ECOLOGICAL RESOURCES

Board of Supervisors' Environmental Vision:

“Parks, trails, and green space provide habitat and other ecological resources that promote the physical and mental well-being of residents through supporting healthy lifestyles and allowing for interaction with our natural environment... Ecological resources that include the soil, water, air, plants, animals, ecosystems and the services they provide are considered natural capital and green infrastructure. The public, or ecosystem, services provided by this green infrastructure are often more cost-effective than the engineered alternatives, and thus are managed as any other infrastructure or capital asset through deliberate inventory, planning, maintenance, enhancement, and restoration to ensure healthy, high functioning, and resilient ecosystems and environment. Maintaining healthy, natural ecosystems is a priority of Fairfax County.”²⁶

INTRODUCTION

Fairfax County contains roughly 226,707 acres of developable land². The county's ecological resources, owned by different entities, are dispersed across this acreage. This chapter will focus on the health of the county's natural ecosystems with an emphasis on the plant and tree components of green infrastructure described above in the board's Environmental Vision (whereas Water and Wildlife Resources are addressed in other chapters). The topic of trails, as it relates to the environment, is generally covered by the Transportation chapter.

How Land is Used

As the county seeks to maintain healthy, natural ecosystems, the manner in which land is used and developed is a critical aspect to consider. The following three classifications of land use account for nearly 80 percent of the land in the county:

- **Parks and recreation** (15.1 percent; 34,203 acres)²⁷
 - Most of that acreage is owned and managed by the Fairfax County Park Authority (FCPA) (23,890 acres in August 2019) and the Northern Virginia Regional Park Authority (NOVA Parks) (8,554 acres in August 2019).
- **Vacant or natural** (5.6 percent; 12,606 acres)²
 - This land decreased by 1,196 acres between 2017 and 2020 due to growth pressures within the county as it is zoned for residential, industrial, or commercial uses and continues to be developed.

²⁶ 2017 Fairfax County Environmental Vision, Section 2 E “Parks and Ecological Resources”

<http://www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf#page=30>

²⁷ 2020 Land Use and Zoning Data, Acres of Land by Existing Land Use Category (Planning District, Supervisor District & Human Services Region); Acreage does not include areas in roads, water, or small areas of land unable to be zoned or developed. <https://www.fairfaxcounty.gov/demographics/find-data-topic>

- **Residential** (59.1 percent; 134,027 acres)²
 - This significant percentage underscores the impact that private property can have on our environmental services and natural capital. Between 2017 and 2020, the county saw an increase in 1,083 acres of residential property.

While not all the acreage described above can be considered as valuable as natural habitat, all areas—including active recreation areas, private open space, county and school properties, and residential areas—can each enhance the environment (e.g., by reducing stormwater runoff, adding trees) if properly managed and/or designed. Furthermore, the many economic, social, and health benefits that ecological resources provide cannot be overlooked.²⁸

The distributed nature of ecological resources was clearly demonstrated by the Office of Environmental and Energy Coordination in an August 2021 presentation to EQAC. Strategy 12 in the Community-wide Energy and Climate Action Plan (CECAP)²⁹ aims to “Support preservation, restoration, and expansion of natural systems and green spaces.” Staff showed this strategy overlapping with all but two EQAC chapters³⁰, though Transportation (due to its land-use implications) certainly overlaps as well.

Organizations of Note

A wide variety of organizations and programs impact Fairfax County’s ecological resources with a broad set of stakeholders including federal, state, local, non-profit, and private landowners. This chapter provides a reference list of organizations in the “Additional Information” section.

Ecological Resources on Non-Park Land

With most land in Fairfax County classified as “non-park” land (e.g., residential, government-owned, and commercial), the linkage between regulations, land use decisions, and the county’s broader ecological resources is a critical consideration for the ecological health of the county.

Doug Tallamy, professor of Entomology and Wildlife Ecology at the University of Delaware and author of Bringing Nature Home, addresses the potential of private land to be an ecological resource: “Lawn should not be our default landscaping practice. If we cut the area of lawn [in the U.S.] in half and [sic] we could create the equivalent of a new national park that is 20 million acres in size. That alone would create the biggest natural area in the nation, bigger than most of our national parks combined.”³¹

²⁸ [Green Cities: Good Health \(washington.edu\)](https://www.washington.edu/green/cities/good-health/)

²⁹ July 2021 draft CECAP report:

<https://www.fairfaxcounty.gov/boardofsupervisors/sites/boardofsupervisors/files/assets/meeting-materials/2021/july20-environmental-cecap-final-report.pdf>

³⁰ OEEC presentation to EQAC; slide 7: https://www.fairfaxcounty.gov/environment-energy-coordination/sites/environment-energy-coordination/files/assets/aug%2011%20eqac%20cecap%20resilient%20fairfax%20presentation_a-1a.pdf#page=7

³¹ <https://www.highcountrygardens.com/gardening/bringing-nature-home-interview-with-doug-tallamy/>

A variety of ordinances and policies provide guidance for private property owners on topics which directly impact Fairfax County’s ecological resources. This chapter provides a reference list in the “Additional Information” section.

It is also worth noting that the fourth unstaffed program area of Fairfax County Park Authority’s Natural Resource Management Plan³² would further contribute to this area through the goal to *“Work with adjacent landowners to expand natural areas beyond park boundaries through education, easements and cooperative agreements”* and to *“Encourage habitat expansion through native landscaping practices.”*

CURRENT STATUS

People flocked to outdoor places during the COVID-19 pandemic for a place of solace and to help improve their mental health. Our local parks have seen visitation skyrocket, and, at times, the county’s natural resources have suffered due to the influx of visitors. The desire and need for residents’ access to safe, outdoor green spaces has never been more apparent.

As the county continues to develop land, it is important to actively preserve, protect, enhance, and expand its current park land. In addition, county government could preserve and protect ecological resources on private land with approaches such as improved site planning and conservation easements. In all of these efforts, it is important to consider the quantity, quality, and equity of the county’s tree canopy to improve air and water quality as well as to help mitigate climate crisis impacts, such as heat island effects and increased stormwater runoff.

Ecological Corridors

The county’s Comprehensive Plan³³ contains strong language in support of the board’s Environmental Vision, particularly in the Environment³⁴ section. A key objective the county should continue to focus on is identifying, protecting, and enhancing an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County via Environmental Quality Corridors (EQCs).³⁵

This principle, which can be applied across agencies and organizations, aims to connect high value ecological core areas by identifying critical ecological links in the network of forested areas to protect and enhance critical components of this network. The “ecological spines” concept integrated into the Embark Richmond Highway Comprehensive Plan Amendment³⁶ is an example of an innovative way the county is thinking about EQCs.

Ecological resources on private property are also worth noting here as well, as individual

³² Page 10:

<https://www.fairfaxcounty.gov/parks/sites/parks/files/assets/documents/naturalcultural/nrmp012914.pdf>

³³ <https://www.fairfaxcounty.gov/planning-development/fairfax-county-comprehensive-plan>

³⁴ <https://www.fairfaxcounty.gov/planning-development/sites/planning-development/files/assets/compplan/policy/environment.pdf>

³⁵ Objective 9 of the Environment section of the Comp. Plan (link above in footnote 7) discusses EQCs.

³⁶ Page 16: <https://www.fairfaxcounty.gov/planning-development/sites/planning-development/files/assets/documents/compplanamend/embarkrichmondhwy/documents/2017-10.pdf#page=20>

properties have the opportunity to be “habitat stepping-stones” linking public lands as part of ecological corridors. Fairfax County may wish to consider how policy changes or incentives for private landowners may help further this goal.

Natural Threats

Excessive native white-tailed deer populations, as well as non-native invasive species, degrade our ecological resources. When deer populations rise above the carrying capacity³⁷ of an area, they can strip an area of native vegetation, including tree seedlings, up to a height of six feet, destroying the understory layer of the forest and preventing forest regeneration. Invasive plants, which deer do not generally eat, can expand rapidly by their nature, and put further pressure on the understory and forest regeneration.

Additionally, non-native insects (e.g., Hemlock Woolly Adelgid, Emerald Ash Borer) and disease (e.g., Chestnut blight) are added stressors to our native, ecological resources. Of emerging concern is the Spotted Lanternfly, which has not yet been detected in Fairfax County but has been found as close as Prince William County as of May 2021³⁸. Fairfax County’s Urban Forestry Management Division’s (UFMD) Forest Pest Management Branch³⁹ addresses the wide range invasive forest pests that pose a threat to the county’s urban forest.

- *Deer*

This topic is addressed in the Wildlife Management chapter in greater detail. Fairfax County is the only jurisdiction with an active deer management program, with adjacent jurisdictions not having a program or relying on the public to manage deer populations.

- *Non-native invasive plants*

The problem of invasive plants is systemic: many plants which would otherwise be classified as noxious weeds⁴⁰ are permitted to be sold in the landscaping trade where landowners purchase them, dispersing them throughout the county. Unmanaged natural lands are especially impacted by wind, birds, and other forces that distribute invasive plant material far and wide, disregarding property lines.

Fairfax County Park Authority’s (FCPA) Invasive Management Area (IMA) program⁴¹ leverages the power of volunteer site leaders to lead invasive plant removals on FCPA property, providing the county hundreds of thousands of dollars in value each year. The Early Detection Rapid Response (EDRR)⁴² program, as part of the IMA program, finds new populations of certain invasive species and aims to eradicate them before they cause serious ecological harm. The IMA program is the strongest of its kind in Northern Virginia, and yet it only focused on a small subset of the 10 percent of land owned by FCPA.

³⁷ <https://dwr.virginia.gov/wildlife/deer/deer-management-program/>

³⁸ <https://www.loudoun.gov/spottedlanternfly>

³⁹ <https://www.fairfaxcounty.gov/publicworks/trees/forest-pests>

⁴⁰ <https://www.vdacs.virginia.gov/plant-industry-services-noxious-weeds.shtml>

⁴¹ <https://www.fairfaxcounty.gov/parks/invasive-management-area>

⁴² <https://www.fairfaxcounty.gov/parks/invasive-management-area/early-detection>

Effectively addressing this threat requires collective action between public and private landowners. Of particular need is encouraging private landowners to address these problems on their land, facilitating improvements, and encouraging long-term management to ensure continued ecological benefits. The Reston Association has set an example for others in their 2016 banning, through the covenant process, of the use of any plants on the Virginia Department of Conservation and Recreation list of invasive plants⁴³.

Opportunities

In addition to addressing the threats above, four general opportunities to ensure Fairfax County maintains a healthy, natural ecosystem include avoiding replacing ecological resources with pavement, improving land development, maintaining a healthy and equitable tree canopy, and sufficiently funding FCPA.

- *Avoiding replacing ecological resources with pavement*
Our ecological resources are increasingly feeling the pressure of an urbanizing county. As a principle, ecological resources must not be traded away in favor of paved, impervious surfaces. Transportation-related projects, often relating to cars, threaten natural areas and open space. Just a few examples include:
 - *Justice Park*: The Land Use chapter highlights the concerns for Justice Park in trading away park acreage for a parking lot.
 - *Shirley Gate Road Extension project* as currently proposed would impact dozens of acres of forested Fairfax County Park Authority property, bisecting a currently forested area.
 - *Cinder Bed Road bikeway*: Even important and necessary projects seeking to build out the county's cycling infrastructure, such as the Cinder Bed Road bikeway project, are threatening valuable natural resources. If not planned to minimize impacts to ecological resources, transportation projects can needlessly bisect forests habitats and increase impervious surfaces in floodplains.
- *Improving land development*
As properties continue to develop and re-develop, well-designed land use can contribute to a healthy ecology. This topic is addressed in the Land Use chapter in greater detail, but it is worth noting here that concepts such as biophilic designs⁴⁴ can significantly enhance an area's natural resources. UFMD's review of infill plans helps to inform landowners of ecologically important features, but benefits are missed if the review comes too late in the review process to influence the site design. Deviations to the tree ordinance are not uncommon and natural resources are not prioritized in the overall land development process. The number of reviews by UFMD continues to increase as well, with a 20 percent increase in initial infill submissions from FY 2019 to FY 2020, and an overall increase in initial infill submissions of 180 percent from FY 2017 to FY 2020⁴⁵.

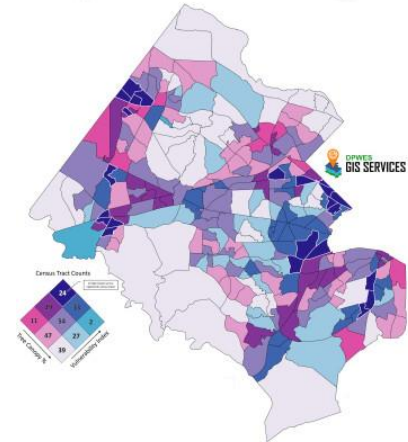
⁴³ <https://www.dcr.virginia.gov/natural-heritage/invspdpdlist>

⁴⁴ <https://www.greenroofs.com/2019/02/20/biophilia-turning-conventional-architecture-inside-out/>

⁴⁵ August 13, 2021 email from Matthew Hansen, Director, Site Development and Inspections Division, LDS

- *Healthy, equitable tree canopy*

As of August 2021, UFMD was seeking to contract an update to the Urban Tree Canopy Analysis (UTC), using high resolution satellite imagery, including Light Detection and Ranging (LIDAR) imagery, from the University of Vermont Spatial Analysis Laboratory. The most recent report was delivered in May 2017⁴⁶. With new data, subsequent analysis, and continued regular updates, the county will have a tool to work toward a healthy tree canopy that is equitably distributed across the county to ensure that all residents reap the benefits of tree cover in the spirit of One Fairfax.



In 2021, staff in the Department of Public Works and Environmental Services put together an initial map⁴⁷ (shown here) overlapping areas of existing tree canopy coverage with a vulnerability index that help identify areas of greatest need. As new data is received, maps such as these can help drive decision making. Outreach to engage communities in areas where the tree canopy can provide the greatest impact can be critical to the long-term success of tree plantings⁴⁸.

- *Sustained FCPA funding to support natural resources*

The current funding structure for FCPA creates challenges in supporting the long-term health of FCPA's natural resources. One-off funding sources, such as funds from proffers, donations, the Environmental Improvement Program (EIP)⁴⁹, and project-based bond funds, are critical under the current structure. However, project-based funding means that once a project, such as an ecological restoration, has been completed, the long-term maintenance and upkeep—managing for invasive plants, for instance—must be funded through different means.

Particularly challenging in the current funding structure is hiring people to lead longer-term initiatives. Disparate funding avenues leads to instability and lack the long-term security needed to effectively protect natural resources. Underscoring the discrepancy in funding versus need, FCPA's 2016 Needs Assessment⁵⁰ reported that an additional \$2,350 per acre of annual funding (for all 17,000 acres of natural area owned by FCPA--close to \$40M/year) would be needed to perform the necessary maintenance activities for the county's natural resources.

⁴⁶ <https://www.fairfaxcounty.gov/publicworks/sites/publicworks/files/assets/documents/tree-canopy-report-2015.pdf>

⁴⁷ Tree canopy & vulnerability map of Fairfax County developed by Fairfax County staff Yeoanny Venetsanos and Juan Reyes.

⁴⁸ <https://www.bloomberg.com/news/articles/2019-01-11/why-detroiters-didn-t-trust-city-tree-planting-efforts>

⁴⁹ FY2020 EIP projects: <https://www.fairfaxcounty.gov/environment-energy-coordination/sites/environment-energy-coordination/files/assets/documents/pdf/fy%202020%20sustainability%20initiatives.pdf#page=108>

⁵⁰ <https://www.fairfaxcounty.gov/parks/sites/parks/files/Assets/documents/plandev/parkscout/needs-assessment-plan-050616.pdf>

RECOMMENDATIONS

1. Increase Capacity for Environmental Review of Development Plans

Recommendation: 5PER-2019.1 | Age: 3 years | Status: Stalled

Justification and Background:

EQAC appreciates that an MOU between Land Development Services and Urban Forest Management Division (UFMD) is updated each year to ensure that the workload and demand of plan reviews are in sync. Nonetheless, the continued increase in infill applications combined with the on-going challenge of sufficient review capacity has at times resulted in a lower quality review of the incoming applications than for which UFMD strives.

2. Improving the Land Development Process by Prioritizing Trees

Recommendation: 5PER-2021.2 | Status: New this year

Justification and Background:

The way land is developed can either improve or degrade the ecologic function of an area. Processes and incentives can help ensure good ecological choices are made which can ensure longer term sustainability of our natural resources, improve climate resiliency, and help to mitigate the impacts of the current climate crisis. EQAC recommends the board seek state authority, as needed, to improve this process. The September 2, 2021, Tree Commission letter to the Board of Supervisors detailed a clear set of six recommendations with which EQAC concurs:

- A Natural Resources and Tree Inventory with a Conceptual Site Plan should be approved prior to submittal of the Site Plan.
- Increase property boundary setbacks for infill development and re-zonings to provide adequate space for preservation of mature trees and planting of large shade trees.
- In areas with building height limitations, provide developers the option to build higher, thereby achieving more density, with a concurrent development condition that the building footprint must be reduced to allow for tree preservation or large shade tree plantings.
- Raise the fee in lieu to reflect appraised value.
- Analyze effectiveness of the 10-year tree canopy requirement
- Identify high priority tree planting areas using an equity lens and vulnerability index.

3. Seek More Stable Funding Sources for Fairfax County Park Authority (FCPA) Initiatives

Recommendation: 5PER-2021.3 | Status: New this year

Justification and Background:

Budgeting challenges for FCPA result in instability over the long term, particularly in terms of maintenance for and management of the parks' natural resources. EQAC recommends the board work with staff to seek additional means of stable, long-term funding for FCPA's natural resources maintenance activities. Ideas include, but are not limited to, the creation of a new natural resources management tax district to provide steady revenue each year, expanding the Fund 40080, Integrated Pest Management Program definition to include invasive plants and perhaps even deer, or establish funding through the budget process to support a FCPA ecologist maintenance program with additional staff positions to address long-term natural resource management needs across FCPA's approximately 17,000 acres of natural area.

4. Strengthen Authority to Address Management of Invasive Species Throughout the County
Recommendation: 5PER-2021.4 | Status: New this year

Justification and Background:

EQAC supports the current exploration into what the county can do to provide further support in the management of all invasive plant species. While state authority provides for allowing penalties for landowners not controlling running bamboo, this could introduce potential equity issues. As such, EQAC appreciates staff's broader exploration into a more holistic and equitable solution to the growing problem of invasive plants, such as the possible creation of a special tax district to assist with funding invasive removal on private property. Additional ideas include:

- Seeking ways to work with developers to avoid the use of non-native invasive plants in landscaping and to include a ban on homeowner use of non-native invasive plants, similar to the Reston Association, in initial covenants of new developments.
- Seeking authority to fund matching grants through the Northern Virginia Soil & Water Conservation District to treat invasive plants.
- Supplementing any additional programmatic solutions with additional resources for public outreach and education about using native plants and avoiding non-native invasives.

COMMENTS AND CONCERNS

1. Environmental Improvement Program (EIP) Funding

EQAC commends the Board of Supervisors for their continued and increased funding support of the EIP. The FY 2020 Adopted Budget of \$916,615 was an increase of \$381,615 over allocated funds in the FY 2019 Adopted Budget Plan for this program. This funding will go towards ecologically important programs such as the Invasive Management Area program, Watershed Protection and Energy Conservation Matching Grant Program, and projects in support of the recently adopted Natural Landscape Implementation Plan.

2. Recognition of Ecological Resources as a Tool for Climate Mitigation and Resiliency

While the county's emission *reduction* efforts must account for the two biggest emitters – transportation and buildings – trees and plants play a pivotal role more broadly in mitigating the impacts of climate change and contributing to climate resiliency. Trees come with a host of climate-related benefits, including carbon sequestration, mitigation of heat island effects, reduction of building cooling and heating costs when planted strategically, and increased stormwater retention. Preservation and expansion of our natural stream buffers will also contribute to our climate resiliency as we face stronger, more frequent storms. It is important for the county to balance development with preservation of its ecological resources, particularly in not trading ecological resources for increases in impervious surfaces.

3. Hiring of Part-Time Wildlife Assistant

Ecological impacts from an overabundance of wildlife requiring management, such as white-tailed deer or Canada geese, require time and effort to mitigate. Added staff capacity, as noted in the recommendation in the Wildlife Management chapter, would also help preserve

the county's ecological resources.

4. **Environmentally Focused Program Support**

EQAC commends the Board of Supervisors for crafting a solid Environmental Vision, which supports and endorses policies and programs such as the Tree Action Plan and the Environmental Improvement Program (EIP). These programs help support important efforts by the agencies mentioned. EQAC also commends FCPA for efforts to begin to implement the Natural Resource Management Plan without recurring funding for ecological maintenance. Going forward, it will be important to emphasize and measure the *quality* of the county's resources in addition to the *quantity*.

ADDITIONAL INFORMATION

List of Organizations Impacting Ecological Resources

Various organizations and programs impact Fairfax County's ecological resources. This list is provided to demonstrate the distributed nature of our county's ecological resources and to provide context to the wide variety of entities involved in influencing their preservation:

Key County Organizations / Departments

- Fairfax County Park Authority (FCPA)
- NOVA Parks
- Urban Forest Management Division (UFMD)

Other Governmental Agencies, Programs, and/or Properties

- Local
 - Agricultural and Forestal Districts⁵¹
 - Fairfax County Public Schools (FCPS)
 - Policy for Environmental Stewardship (Policy #8542⁵²) and Get2Green⁵³ program
 - Fairfax County Wetlands Board⁵⁴
 - Fairfax County Stormwater Management Program⁵⁵
 - Fairfax County Land Development Services (LDS)
 - LDS administers the Public Facilities Manual,⁵⁶ covers several important environmental topics, including a section for Tree Conservation.
 - Northern Virginia Soil & Water Conservation District (NVSWCD)⁵⁷
- State and Federal
 - Gunston Hall⁵⁸ (553 acres on the Mason Neck Peninsula in Fairfax County)

⁵¹ <https://www.fairfaxcounty.gov/planning-development/agricultural-forestal-district>

⁵² <https://www.boarddocs.com/vsba/fairfax/Board.nsf/goto?open&id=867SG92A805A>

⁵³ <http://get2green.fcps.edu/>

⁵⁴ <https://www.fairfaxcounty.gov/bacs/BoardDetails.aspx?BoardID=23219>

⁵⁵ <https://www.fairfaxcounty.gov/publicworks/stormwater>

⁵⁶ <https://www.fairfaxcounty.gov/landdevelopment/public-facilities-manual>

⁵⁷ <https://www.fairfaxcounty.gov/soil-water-conservation/>

⁵⁸ <https://gunstonhall.org/>

- National Park Service
 - As of June 2015, the National Park Service held 38 conservation easements covering 326 acres in Fairfax County.
- Virginia Department of Conservation and Recreation⁵⁹ (1,856 acres in Fairfax County)
- Virginia Department of Forestry (VDOF)⁶⁰
- Virginia Department of Environmental Quality (DEQ)⁶¹
- Virginia Department of Transportation (VDOT)⁶²
- Virginia Outdoors Foundation (VOF)⁶³
 - VOF holds seven easements covering 127 acres in Fairfax County.
- U.S. Bureau of Land Management⁶⁴ (800 acres in Fairfax County)
- U.S. Fish and Wildlife Service⁶⁵ (2,350 acres in Fairfax County)

Non-Profits and Homeowner Associations (HOAs)

- Earth Sangha⁶⁶
- Fairfax Chapter of the Virginia Master Naturalist Program⁶⁷
- Fairfax County Restoration Project (FCRP)⁶⁸
- Fairfax ReLeaf⁶⁹
- Metropolitan Washington Council of Governments (MWCOG)⁷⁰
- The Nature Conservancy (TNC)⁷¹
 - TNC owns the 233-acre Fraser Preserve on the Potomac River.
- Northern Virginia Conservation Trust (NVCT)⁷²
- Plant NOVA Natives (PNN)⁷³
- Reston Association (RA)⁷⁴
 - Beginning in 2017, RA published the Reston Annual State of the Environment Report (RASER) which evaluates the state and management of Reston's 1,300+ acres of open space, including 800 acres of woodlands, four lakes, four wetlands, three ponds, and 50 meadows.

⁵⁹ <https://www.dcr.virginia.gov/state-parks/mason-neck>

⁶⁰ <https://dof.virginia.gov/>

⁶¹ <https://www.deq.virginia.gov/>

⁶² <https://www.virginiadot.org/programs/pr-environmental.asp>

⁶³ <https://www.vof.org/resources/statistics/easements-by-locality/>

⁶⁴ <https://www.blm.gov/office/lower-potomac-field-station>

⁶⁵ https://www.fws.gov/refuge/mason_neck/

⁶⁶ <http://www.earthsangha.org/>

⁶⁷ <http://www.vmnfairfax.org/>

⁶⁸ <https://www.fcrpp3.org/>

⁶⁹ <http://www.fairfaxreleaf.org>

⁷⁰ <https://www.mwcog.org/committees/regional-tree-canopy-workgroup/>

⁷¹ <https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/fraser-preserve/>

⁷² <https://www.nvct.org/>

⁷³ <https://www.plantnovanatives.org/>

⁷⁴ <https://www.reston.org/nature-environmental-overview>

Ordinances and Policies

Various Fairfax County ordinances and policies⁷⁵ provide guidance for private property owners on topics including, but not limited to:

- Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) located within the unincorporated areas of Fairfax County (Chapter 118, Chesapeake Bay Preservation Ordinance⁷⁶)
- The conservation (i.e., preservation and planting) of trees during the land development process (Chapter 122, Tree Conservation Ordinance⁷⁷)
 - While this ordinance sets standards such as ten-year tree canopy requirements, it should be noted that, by law, LDS *can* allow development plans to take precedence over the requirements. Deviations, in whole or in part, from the tree preservation target may be requested under certain conditions. Similarly, where strict application of the requirements would result in unnecessary or unreasonable hardship to the developer⁷⁸, exceptions to the tree canopy requirements can also be granted. In practice, it should be noted that the Urban Forest Management Division has been given the responsibility for the review and approval of any deviations to the tree preservation target and any modifications to the 10-year tree canopy requirement.
 - The Tree Conservation section of the Public Facilities Manual⁷⁹ provides support for the ordinance mentioned above. It provides incentives for planting native tree species and disincentives for planting non-native or invasive tree species, to meet tree and landscaping requirements in all development projects.
- Mitigating the harmful effects of erosion and sediment during land-disturbing activities (Chapter 104, Erosion and Sediment Control⁸⁰)
- Floodplains and Environmental Quality Corridors (EQCs) for the conservation of stream valleys as well as the broader health of our contiguous natural properties (the Floodplain Ordinance is codified as part of the zoning ordinance⁸¹; EQC Policy⁸²)
- Grass or lawn area areas located within Fairfax County for property other than those zoned for or active in farming operation (Chapter 119, Grass or Lawn Area⁸³)

⁷⁵ <https://www.fairfaxcounty.gov/landdevelopment/codes-and-standards>

⁷⁶ <https://www.fairfaxcounty.gov/landdevelopment/chesapeake-bay-preservation-ordinance>

⁷⁷ <https://www.fairfaxcounty.gov/publicworks/trees/rules>

⁷⁸ Chapter 122, Section 122-2-6. - Exemptions and Modifications

<https://www.fairfaxcounty.gov/landdevelopment/codes-and-standards>

⁷⁹ Chapter 12; <https://www.fairfaxcounty.gov/landdevelopment/public-facilities-manual>

⁸⁰ https://library.municode.com/va/fairfax_county/codes/code_of_ordinances?nodeId=THCOCOFVII1976_CH104ERSECO

⁸¹ <https://www.fairfaxcounty.gov/planning-development/zoning-ordinance>

⁸² Objective 9 on p. 14: <https://www.fairfaxcounty.gov/planning-development/sites/planning-development/files/assets/documents/comprehensiveplan/planhistoricpolicy/2013/environment/3-14-2017.pdf>

⁸³ http://fairfaxcounty.elaws.us/code/coord_ch119

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VI. CLIMATE AND ENERGY

The Board of Supervisors' Environmental Vision

“The county will continue its leadership and commitment to promote and encourage energy efficiency and conservation efforts and renewable energy initiatives by employees, employers and residents. The county will work with local authorities, businesses, and residents to encourage sustainable reductions of the county’s geographical emissions that will contribute to achieving the targets as identified by the Cool Counties Climate Stabilization Declaration and the Metropolitan Washington Council of Governments. The county also will continue to support attainment of air quality through regional planning and action.”⁸⁴

INTRODUCTION

Climate change is having significant impacts worldwide and Fairfax County is joining governmental bodies within and outside the U.S. in taking steps to mitigate the impacts of Greenhouse Gases (GHGs). GHG emissions result from the combustion of fossil fuels and persist in the atmosphere for many years. Once GHGs reach the atmosphere, they capture the energy from sunlight and radiate heat back to the lower atmosphere raising the temperature of the earth’s surface. Carbon dioxide concentrations have risen from an average of 280 parts per million (ppm) in the 1700’s to 410 ppm in 2019.⁸⁵

The impact of carbon dioxide and other GHGs on the climate system relative to Fairfax County is most evident in terms of extreme heat and precipitation. As shown in Figure 1, Number of days at or above 95 degrees Fahrenheit⁸⁶, extended periods of extreme heat are expected in Fairfax County according to climate projections. Projections indicate temperatures at or above 95°F for four to five weeks per year by 2050 and five to ten weeks per year by 2085. At the same time, seasonal patterns are shifting from snow to rain with increases in rainfall event durations and depths associated with local flooding. Also, higher surface temperatures are expected to lead to further sea level rise, and thereby inundate some coastal portions of the county.

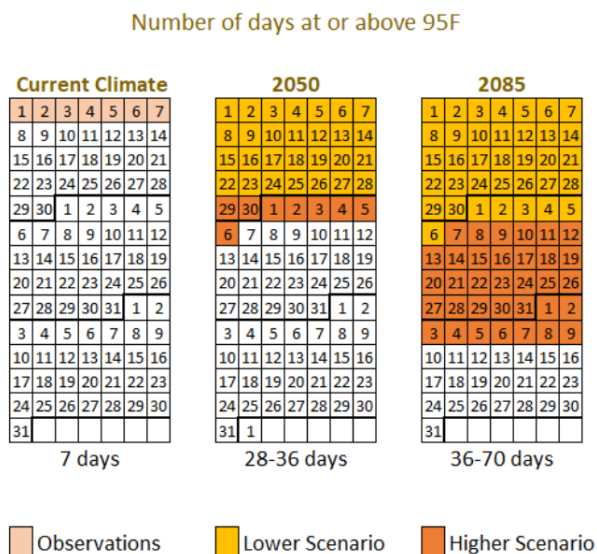
⁸⁴ 2017 Fairfax County Environmental Vision, Section 2 F “Climate and Energy”

<https://www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf#page=33>

⁸⁵ See: <https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases>. (Referenced July 24,2021)

⁸⁶ Fairfax County. 2021. Draft Resilient Fairfax Climate Projections Report.

Figure 1. Number of days at or above 95 degrees F under current climate conditions (averaged over 30-year period), 2050 and 2085. Future conditions projected under the lower scenario (RCP4.5) and higher scenario (RCP8.5).



To mitigate or slow the impacts of GHG emissions, GHG emissions must be reduced. On July 13, 2021, the county also adopted the Carbon Neutral Counties Declaration⁸⁷, which provides a commitment to carbon neutrality by 2040. The county's Community-wide Energy and Climate Action Plan⁸⁸ (CECAP) and the Joint Environmental Task Force (JET) Final Report are two of the key reports to inform and guide future actions. The JET Final Report outlines how the emissions from county operations will be reduced. CECAP includes information on emissions, modeling scenarios and strategies to reduce emissions and it also provides recommendations for the entire county that are important to working towards net zero.

The National Aeronautics and Space Administration (NASA) has summarized the impacts that we should expect from climate change through this century and beyond.⁸⁹ These impacts include:

- Temperatures will continue to rise.
- The frost-free season (and growing season) will lengthen.
- There will be changes in precipitation patterns.
- There will be more droughts and heat waves.
- Hurricanes will become stronger and more intense.
- Global changes in sea level are predicted to rise one to four feet by 2100.

⁸⁷ See: <https://www.fairfaxcounty.gov/environment-energy-coordination/carbon-neutral-counties-declaration>. (Referenced July 24, 2021).

⁸⁸ Fairfax County. 2021. Fairfax County Community-wide Energy and Climate Action Plan. See: <https://www.fairfaxcounty.gov/boardofsupervisors/sites/boardofsupervisors/files/assets/meeting-materials/2021/july20-environmental-cecap-final-report.pdf> (Reference August 1, 2021).

⁸⁹ NASA. 2018. Global Climate Change. <https://climate.nasa.gov/effects/>. (Reference September 10, 2021).

The Northern Virginia Regional Commission (NVRC) has highlighted impacts that are expected to result from climate change in the Washington, D.C. area, including Fairfax County.⁹⁰ The potential impacts that have been identified by the NVRC are wide ranging and include, but are not limited to:

- General economic impacts due to extreme weather events.
- Potential reduction in reliability of electrical systems and the electric grid due to heating and cooling.
- Possible increased flood risks to property and infrastructure in flood-prone areas due to increased tidal flooding because of sea level rise and/or tidal surges.
- Increased failure of septic systems, contaminating groundwater.
- Increased demand for emergency management response to extreme weather events.
- Expansion of flood-prone areas and an increase in flood frequency due to changes in precipitation patterns.
- Increased health impacts due to excessive heat, vector-borne and communicable diseases.

For example, in September 2021 torrential rain and flash floods impacted the region, including Fairfax County and a swift water rescue was required to save a motorist in Fairfax County.⁹¹

The health impacts from climate change in Virginia are expected to include an increase in mosquito and tick-borne infections, such as Lyme disease, as well as an increase in the length and severity of the allergy season in Virginia. In addition, the Centers for Disease Control and Prevention have identified excessive heat as a significant influencing factor for climate-related respiratory illness, such as asthma. Fairfax County residents over 65 are showing a higher incidence of hospitalization from respiratory problems in recent years.

CURRENT STATUS

As Table 2 shows, county GHG emissions have been categorized into several categories that can be useful in guiding action. While other events will decrease GHG emissions, the Virginia Clean Economy Act⁹² calls for the state going to net zero by 2045 for Dominion Energy. Thus, Dominion Energy's electricity is expected to come from renewable sources by 2045, which should dramatically decrease emissions from residential buildings and commercial operations. While this Act promises to play a major role in reducing GHG emissions for all electrical use from Dominion Energy, there may still be emissions from oil, diesel, and natural gas emissions associated with residential and commercial operations. Assuming that the Virginia Clean Economy Act is effective in reducing GHGs from electricity providers, three areas will require action:

- Provide safe paths for walking and biking to encourage walking and biking, which is a recommendation in the CECAP.

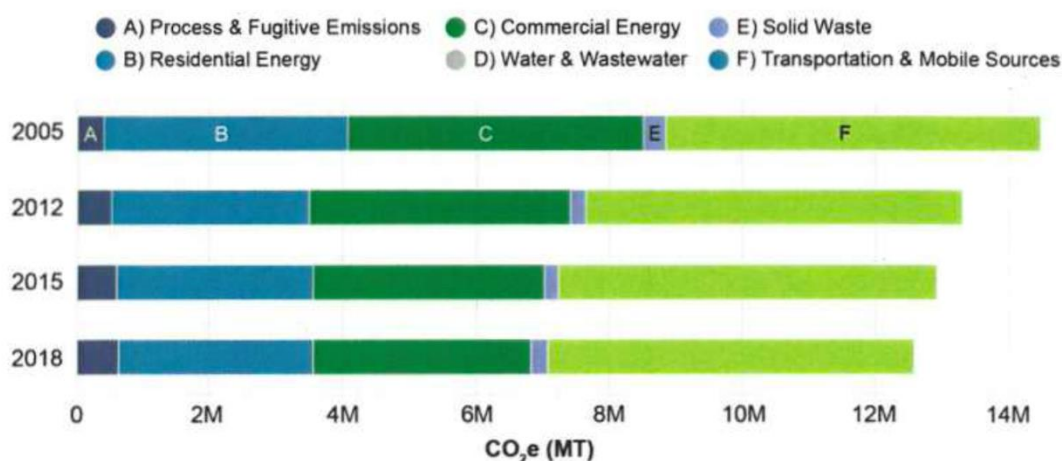
⁹⁰ Northern Virginia Regional Commission. *Sustainable Shorelines and Community Management in Northern Virginia, Phase III*, 2013.

⁹¹ Samenow, J. 2021. Flood videos and photos: ignore "turn around, don't drown" at your own peril. *Washington Post*. https://www.washingtonpost.com/blogs/capital-weather-gang/post/flood-videos-and-photos-ignore-turn-around-dont-drown-at-your-own-peril/2021/09/08/gIQAbKRVCK_blog.html. (Referenced September 10, 2021).

⁹² See: <https://lis.virginia.gov/cgi-bin/legp604.exe?201+sum+SB851>. (Referenced July 24, 2021)

- Promote the purchase of and provide the necessary charging infrastructure to support electric vehicles (EVs), which is also recommended in the CECAP.
- Reduce emissions of oil, diesel fuel, and natural gas as fuel sources that create energy for residential and commercial uses.

Figure 2. Categories of Emission Projected from 2005 to 2018⁹³.



RECOMMENDATIONS

1. Adopt climate and energy related recommendations from other chapters.

Recommendation 6CE-2021.1 | Status: New this year

- Transportation 1: Develop a formal plan to increase light-duty electric vehicle (EV) registrations to at least 15% of total registrations by 2030.
- Transportation 2: Develop a formal plan to increase transit and non-motorized commuting (including teleworking) to at least 30% by 2030, including setting interim target goals to be achieved by 2024 and 2027.
- Stormwater 1: EQAC recommends that those policies and ordinances protecting streams, floodplains and designated Environmental Quality Corridors (EQCs) should remain unchanged or be enhanced. The protection of environmental assets is an essential part of resiliency planning in the face of climate change.
- Ecological Resources 1: Increase capacity for environmental review of development plans.
- Ecological Resources 2: Improving the land development process by prioritizing trees.
- Land Use 1: Update the State of the Plan and Concept for Future Development Map.
- Land Use 2: Advance land development applications and information.
- Land Use 3: Improve processes to minimize ecological degradation from development pressure.
- Land Use 4: Private sector green building standards.

⁹³ Fairfax County. 2021. Fairfax County Community-wide Energy and Climate Action Plan. See: <https://www.fairfaxcounty.gov/boardofsupervisors/sites/boardofsupervisors/files/assets/meeting-materials/2021/july20-environmental-ccap-final-report.pdf> (Reference August 1, 2021).

Justification and Background:

These recommendations from other chapters all share the goal of addressing key climate and energy issues identified by EQAC.

2. Establish plans and milestones and assess the progress that is being made for both Fairfax County efforts and Virginia's implementation of the Virginia Clean Economy Act.

Recommendation 6CE-2021.2 | Status: New this year

Given that the GHG emissions associated with electricity should be addressed by the power providers, additional plans with milestones would be helpful to gauge our ability to meet the county's net zero goal for transportation, off road emissions, and commercial operations emissions associated with fossil fuel combustion.

Justification and Background:

There are multiple activities that will contribute to GHG emission reductions and it is important to see that these activities are working as intended. Moreover, it is important to seek out additional opportunities to reduce GHG emissions as new opportunities will likely arise in the future due to technological or other changes that might not have been considered viable today.

3. Undertake a major outreach and educational campaign on the actions that businesses and residents can do to reduce GHG emissions.

Recommendation 6CE-2021.3 | Status: New this year

Justification and Background:

Efforts to address climate changes are critical to the future and community support is important. County residents and businesses need good information about ways that they can reduce their carbon footprint. Areas to be highlighted in the outreach and educational campaign include:

- Promoting the importance of vehicles, buses, and large transport vehicles that will reduce GHG emissions, especially electronic vehicles.
- Promoting the importance of reducing energy consumption through energy efficiency and reducing the use of energy.
- Promoting the use of battery powered lawn mowers and other tools rely on battery power.

4. The Fairfax County Board of Supervisors should appoint a group of business leaders to advise the board on climate and energy issues.

Recommendation 6CE-2021.4 | Status: New this year

Justification and Background:

The ideas, creativity and actions of the business community should be recognized, and they could add significantly to the tools used to reduce GHG emissions. This kind of leadership is important to promote climate and energy interests with the business community in Fairfax County.

5. **Work with the Virginia Association of Counties and the Northern Virginia Regional Commission to explore, promote, and possibly provide incentives so that visitors to Fairfax County and other areas in Virginia and neighboring states will have access to efficient (i.e., quick) charging for electric vehicles.**

Recommendation 6CE-2021.5 | Status: New this year

Justification and Background:

Just as cars need to refuel with gasoline, electric vehicles will require charging stations. Electric vehicles typically have a range of about 200 to 300 miles before they need to recharge. Therefore, travelers going to destinations longer than this distance will require charging stations to continue on their journey.

6. **Take actions in the CECAP report that the county can take immediately.**

Recommendation 6CE-2021.6 | Status: New this year

Justification and Background:

If there is concern about implementing all of those labeled as immediate for the timeframe, prioritize those recommendations that will be needed to support charging for EV, such as Action 7C, Install EV Chargers in New Buildings.

COMMENTS AND CONCERNS

1. **Meeting the Targets set in the Virginia Clean Economy Act**

The Act provides targets for GHG emissions reductions but steps to ensure that targets are met appear to be unclear.

2. **EV Batteries**

EV batteries are continuing to improve with performance. At present, they are often limited to a range of 200 to 300 miles, which will not be sufficient for long road trips. Tier 3 chargers, or direct charging, provides for faster charging but may still require an hour to recharge a battery to 80%. Until there is an extensive network of fast charging stations and charging times improve, there will likely be a redundancy to purchase EVs.

VII. AIR QUALITY

Board of Supervisors' Environmental Vision:

*"The county also will continue to support attainment of air quality through regional planning and action."*⁹⁴

INTRODUCTION

Fairfax County is part of a federal-state-regional-local partnership, which has worked for the last several decades to improve air quality. While air quality is a regional issue that is beyond the control of any one state or local government, governments at all levels play important roles in identifying measures that are needed to improve air quality and in implementing related strategies.

In the metropolitan Washington, D.C. area, air quality planning efforts have been focused on regional strategies to bring the area into attainment with federal air quality standards (i.e., the National Ambient Air Quality Standards, or NAAQS). The Metropolitan Washington Council of Governments (MWCOG), through the Metropolitan Washington Air Quality Committee (MWAQC), has coordinated, and continues to coordinate, these efforts.

The county's major responsibilities in the partnership involve participation and coordination with regional and state organizations on plans intended to reduce air pollution and improve air quality as well as the implementation of local programs that help to minimize or eliminate air pollution.

Looking back over the past two decades, there is much to celebrate in the area of air quality. All six pollutants regulated by the federal Clean Air Act have shown a downward trend in the region, and all but one, ground-level ozone, are below federal air quality standards. Overall, the number of unhealthy air days has significantly decreased over the past 25 years.

The COVID-19 pandemic had an impact on air quality in 2020, with a number of the actions taken to limit virus transmission contributing to lower emissions. This resulted in fewer unhealthy days, with just two such days being recorded in 2020. However, this decrease was temporary. As the region has reopened, preliminary data from MWCOG has already registered six unhealthy air days as of July 30, 2021.

The region has made tremendous progress in its air quality thanks to actions at the federal, state, and local government levels, including new regulations to reduce emissions from power plants, passenger vehicles, and heavy-duty diesel engines as well as programs to improve energy efficiency and renewable energy use.

⁹⁴ Excerpt from the vision statement for the Climate and Energy core service area: 2017 Fairfax County Environmental Vision, Section 2 F, pg. 28, www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf

Vehicle emissions are a major contributor to ground-level ozone formation and greenhouse gas emissions in Fairfax County and those impacts, combined with climate change, present a threat to the county's future air quality because rising temperatures speed up the formation of ground-level ozone and lead to more violations of the federal ozone standard.

CURRENT STATUS

NAAQS have been established for the major pollutants regulated under the federal Clean Air Act. Fairfax County relies on data provided by MWCOG to assess the status of the Washington, D.C. metropolitan area, including Fairfax County, relative to these standards. As previously noted, the Washington metropolitan region is in compliance with all current federal air quality standards, except for ground-level ozone.

Ground-level Ozone

Ground-level ozone, colloquially called “smog,” can cause breathing problems for sensitive persons, especially those with asthma. It is formed by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) as they combine in sunlight and heat. Ground-level ozone is considered a summertime pollutant. Some of the major contributors of ground-level ozone are pollutants from vehicle exhaust, industrial facilities, gasoline vapors, paints, aerosol products, and chemical solvents.

In July 2012, the Washington metropolitan region was designated as a “marginal” nonattainment area for the 2008 federal ozone standard of 75 parts per billion (ppb). The region was progressively improving ozone air quality, so the U.S. Environmental Protection Agency (EPA) in November 2017 published a new determination, noting the improvement in air quality achieved by the region and concluded that the area had attained the 2008 ozone NAAQS based on 2013-2015 air quality data. A final 2008 ozone NAAQS redesignation request and maintenance plan for the Washington, D.C.-MD-VA marginal nonattainment area was submitted on January 3, 2018. EPA approved these submissions and redesignated the area to attainment/maintenance for the 2008 ozone NAAQS on April 15, 2019 (84FR15108).

On October 26, 2015, the EPA published a more stringent standard, lowering the ozone standard to 70 ppb. Based on the 2014-2016 ozone data, the Commonwealth of Virginia recommended to the EPA that the Northern Virginia area, including Fairfax County, be designated as a marginal nonattainment area for the 2015 ozone NAAQS. On June 4, 2018, the EPA published designations and classifications for the 2015 ozone NAAQS (83FR 25776). The EPA designated the Northern Virginia area a marginal nonattainment area for the 2015 ozone NAAQS, effective August 3, 2018. The region is required to conduct an emissions inventory. State governments and localities may need to implement new measures to reduce ozone pollution if the region does not attain the 2015 standard by August 3, 2021.

Fine Particulate Matter

Fine particulate matter (PM_{2.5}) is particulate matter that is **2.5 microns in diameter and less**. Fine particulate matter contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems. Fine particles are also the main cause of reduced visibility (haze) in parts of the United States.

Data show that the Washington, D.C. metropolitan region continues to comply with both the annual (12 µg /m³) and daily (35 µg/m³) standards for fine particulate matter. Based on the most recent regional data, the annual design value for PM_{2.5} was just under 10 µg/m³ (relative to the 12 µg/m³ standard) and the 24-hour (daily) design value was 22 µg/m³ (relative to the 35 µg/m³ standard). Additional improvements are expected due to additional retirements of older electrical generating units and other changes that reduce the emissions of sulfur dioxide (SO₂), a precursor to PM_{2.5}.

Nitrogen Dioxide—NO₂

Nitrogen dioxide (NO₂) is a gaseous pollutant formed during the high-temperature combustion of fuels in vehicle engines and industrial facilities (primarily electric generating power plants). NO₂ is a factor in the production of ground-level ozone. It can irritate the lungs and lead to respiratory problems.

On February 9, 2010, EPA published a revised NAAQS for NO₂, strengthening the health-based standard to 100 ppb over an hour. The standard required monitoring to occur near roads, in areas with high community-wide NO₂ concentrations, and in low income or minority at-risk communities. The Washington metropolitan region is in compliance with the NO₂ standard. Data from MWCOG show that concentrations averaged over an hour were 52 ppb in 2019. Fairfax County has one near-road monitoring station (in Springfield); data collection began at that site in April 2016.

Sulfur Dioxide--SO₂

Sulfur dioxide (SO₂) is a gas that forms when sulfur-bearing fuels, mainly coal and oil, are burned. High concentrations of SO₂ can result in difficult breathing and respiratory illness. SO₂ can also have damaging effects on the foliage of trees and agricultural crops.

On June 22, 2010, the EPA published a revised NAAQS for sulfur dioxide (SO₂) by establishing a new one-hour standard of 75 ppb (75 FR 35520). All monitoring data for Virginia demonstrate compliance with this standard. EPA published the 2010 SO₂ NAAQS Data Requirements Rule on August 21, 2015 (80 FR 51052). Under this rule, states must model or monitor air quality around sources that emit 2,000 tons per year or more of SO₂. No such facilities are located in Fairfax County.

Carbon Monoxide—CO

Carbon monoxide (CO) is a colorless, odorless gas that forms when the carbon in fuel is not completely burned. Sources of CO emissions include the use of inefficient or poorly maintained

space heating systems, industrial processes, residential wood burning, and natural sources such as forest fires. Elevated CO levels can lead to visual impairment, reduced work capacity, poor learning ability, and difficulty performing complex tasks.

The Washington metropolitan region, including Fairfax County, has been below the federal standards for CO for the past 25 years.

Lead—Pb

Exposure to lead is a serious health concern, as lead can accumulate in the blood, bone, and soft tissue of the body. Lead in the air mainly results from ore and metals processing and aircraft running on leaded aviation fuel. Other sources of lead come from waste incinerators and lead-acid battery manufacturers.

On November 12, 2008, the EPA published a revision to the NAAQS for lead and associated monitoring requirements (73 FR 66964). This rule set the standard at 0.15 µg/m³. All areas in Virginia, including Fairfax County, are designated as attainment or unclassifiable for the 2008 Lead NAAQS (76 FR 72097).

AIR QUALITY MONITORING

Fairfax County does not have an air quality monitoring program; it works with MWCOG to assess air quality in the region. The Virginia Department of Environmental Quality (DEQ) is responsible for air quality monitoring in Fairfax County in addition to air quality facility inspections. It provides current air quality and forecast data for Northern Virginia and other regions at <https://www.deq.virginia.gov/air/monitoring-assessments/air-quality-forecast>.

EMISSIONS FROM MOTOR VEHICLES

Overview

There is extensive use of motor vehicles in Fairfax County and vehicle emissions are the largest single source of toxic and smog-forming air pollution in Northern Virginia.

DEQ operates a motor vehicle inspection and maintenance program in Northern Virginia. This program requires that vehicles subject to inspection pass an emissions test every two years in order to register or re-register with the Virginia Department of Motor Vehicles.

Alternatives to the use of Motor Vehicles

The Fairfax County Board of Supervisors (BOS) has directed the Fairfax County Department of Transportation to lead the effort to improve bicycle and pedestrian safety and mobility, including constructing bicycle and pedestrian improvements in high-priority areas of Fairfax County.

PUBLIC AGENCY EFFORTS

Metropolitan Washington Air Quality Committee (MWAQC)

Although compliance with National Ambient Air Quality Standards and resulting air quality management responsibilities is a function of federal law, in Fairfax County and other major metropolitan areas in Virginia, these responsibilities have been split between the Commonwealth of Virginia and the regional lead planning organization as defined by Section 174 of the Clean Air Act. MWAQC was established to work cooperatively with state air agencies to conduct interstate air quality attainment and maintenance planning for the metropolitan Washington region. Two members of the Fairfax County Board of Supervisors currently serve on the committee. Kambiz Agazi, **director of the Fairfax County Office of Environmental and Energy Coordination**, and staff from the Fairfax health and transportation departments also attend MWAQC meetings for Fairfax County.

MWAQC works with state departments of transportation and transit providers in identifying transportation needs and priorities. More information about MWAQC, including its bylaws, is available at www.mwcog.org/committees/metropolitan-washington-air-quality-committee/.

Transportation Planning Board

The Transportation Planning Board (TPB), which also is part of MWCOG, serves as the designated Metropolitan Planning Organization for the Washington region and is responsible for regional transportation planning and air quality conformity analysis. The TPB makes transportation investment decisions for the metropolitan area and, by default, for the individual regions encompassed within MWAQC. Fairfax County currently has two members of the Board of Supervisors serving on TPB. TPB and MWAQC work together on air quality and transportation issues.

Clean Air Partners

Clean Air Partners is a nonprofit (501(c)(3)) partnership, chartered by the Metropolitan Washington Council of Governments and the Baltimore Metropolitan Council, that educates the greater metropolitan Baltimore-Washington, D.C. region about the health risks associated with poor air quality and the impacts everyday actions have on the environment. For more than 20 years, Clean Air Partners has been dedicated to empowering individuals and organizations to take simple actions to protect public health, improve air quality and reduce greenhouse gas emissions. Additional information is available at www.cleanairpartners.net/.

RECOMMENDATIONS

- 1. As Fairfax County and the Washington metropolitan region recover from the COVID-19 pandemic, county officials should strongly encourage people to telework where possible, take public transit, and use alternative forms of transit.**

Recommendation 7AQ-2021.1 | Status: New this year

Justification and Background:

One of the key issues related to ozone nonattainment and other air quality concerns in Northern Virginia is the use of motorized vehicles and their emissions. Implementing this recommendation is consistent with the recommendations of the Fairfax County Community-wide Energy and Climate Action Plan (CECAP) and the BOS's Environmental Vision for Transportation. Many air quality issues are tied to federal and state actions over which the county has little or no control. This is one area where the county can take an active role to reduce single vehicle trips within the county and thus enhance air quality through a decrease in vehicle emissions, which are a major contributor to ground-level ozone formation and greenhouse gas emissions in the county.

COMMENTS

1. EQAC commends Fairfax County for using data about air quality as a proxy for a general indicator of environmental quality in the county as part of its outreach materials about economic success (www.fairfaxcounty.gov/economic-success/air-quality). EQAC supports the county's efforts to integrate environmental quality measures into the county's outreach materials about economic success, and encourages it to explore additional environmental measures to include in that effort.
2. EQAC appreciates that the county continues to support participation in and attendance at the Metropolitan Washington Council of Governments' Air Quality Committee (MWAQC) meetings and meetings of MWAQC's Technical Advisory Committee and subcommittees. In addition, EQAC appreciates that county staff collaborates with other local, regional and national air quality organizations, such as Clean Air Partners.
3. EQAC supports the efforts of Fairfax County, the Virginia Department of Transportation and the Commonwealth Transportation Board to provide funding to programs that further the availability and use of non-motorized transportation alternatives for Fairfax County.

VIII. WILDLIFE MANAGEMENT

Board of Supervisors' Environmental Vision:

“Actively manage urban ecological stressors such as overabundant white-tailed deer, non-native invasive vegetation, forest pests, urban stormwater flows, soil compaction and erosion, and others.”⁹⁵

INTRODUCTION

The Fairfax County Sustainability Initiatives⁹⁶ document provides good context about the need for active management of the county's ecological resources:

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

Today, natural resources are considered natural capital.... Natural capital is not self-sustaining; instead, deliberate care and investment are required to enhance, protect and preserve it.”

As with other natural capital, such as land, water, and vegetation, wildlife must also be actively managed to varying degrees to achieve and maintain sustainable population levels within a suburban landscape, which generally presents less suitable habitat that is more fragmented, has fewer natural predators for certain species, and has increased chances of negative human-wildlife interactions. Within the county, the two species that present the most significant challenges to attaining this sustainable balance are white-tailed deer and Canada geese, with uncontrolled deer populations by far posing the greatest risk. While both species are native to our region, the anthropogenic changes within a suburban landscape like Fairfax County result in a situation where each has the potential to cause significant negative impacts on the county's ecological resources and negatively impact public health and safety as well.

The Fairfax County Park Authority (FCPA) has a progressive, stepwise Wildlife Conflict Policy (Policy 202⁹⁷) used to guide actions in addressing human-wildlife conflicts. EQAC commends the Fairfax County Police Department (FCPD) for continuing to fund and staff the Deer Management Program and the Canada Geese Management Program.

CURRENT STATUS

⁹⁵ Excerpt from the vision statement for the Parks and Ecological Resources core service area: 2017 Fairfax County Environmental Vision, Section 2 E, pg. 24,

www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf

⁹⁶ 2017 Fairfax County Sustainability Initiatives, pg. 69, <https://www.fairfaxcounty.gov/environment-energy-coordination/sites/environment-energy-coordination/files/assets/documents/pdf/fy-2020-sustainability-initiatives.pdf>

⁹⁷ Fairfax County Park Authority Policy Manual

www.fairfaxcounty.gov/parks/sites/parks/files/assets/documents/administrative/park-policy-manual.pdf

FY 2021 Fairfax County Deer Management Program

The Fairfax County Deer Management Program is operated on public lands (primarily county and regional parks) and is implemented by FCPD in collaboration with FCPA, NOVA Parks, and other public landholders. During the FY 2021 season, deer herd reduction was sustained through the incorporation of two management methods: archery hunts and sharpshooting. No managed firearms hunts were conducted in FY 2021, but managed hunts remain a viable management method for use in future years. Deer herd reduction activities in FY 2021 yielded 879 deer harvested for all parks, as compared to the FY 2019 season, during which reduction activities removed 959 deer and the FY 2020 season, which totaled 982 deer removed. The Deer Management Program datasets have been published to the county's enterprise GIS database, and the Deer Management Program hunt areas data layer is also available online to the general public.

In FY 2021, 605 volunteer archers contributed 47,413 hours to the Deer Management Program for an average of 78 hours per volunteer. The county's FY 2021 archery program was organized as 18 hunt clusters, which included 104 parks and county-owned properties.

As noted above, the county's Deer Management Program is only operated on FCPA properties, select parks and other open spaces. Given that these public lands constitute less than 20 percent of the total acreage within the county, it is acknowledged that the coordination of hunting on both public and private lands will be necessary to effectively reduce overall deer densities to more sustainable levels and to minimize instances of negative human-deer interactions.

In FY 2018, the FCPD Wildlife Management Office received approval to conduct a follow-up public survey to help determine community needs and expectations related to deer management and for assessing the status of human-deer conflicts and damages experienced by residents in Fairfax County. A similar survey was completed in 2011⁹⁸. Data from this survey will be an integral part of developing a revised Deer Management Plan. The Wildlife Management Office plans to model the survey on a previous Cultural Carrying Capacity survey about white-tailed deer in Virginia developed by the Virginia Department of Wildlife Resources (VDWR) and Virginia Tech University. The results of this survey will allow comparison of deer management in Fairfax County to other jurisdictions in Virginia. While funding was approved for this survey in prior fiscal years, the survey was not able to be completed at that time due to limited staff availability to dedicate to the survey development. Additionally, the COVID-19 pandemic has required staff to be more restrictive in the use of available funds and they will determine whether this public survey can be completed in FY 2022.

FY 2021 Canada Geese Management

FCPD and FCPA support efforts to control resident Canada goose populations by participating in humane egg oiling programs and educating the public about resident Canada geese. In 2021, 97 nests containing 531 eggs were oiled on county parkland at the following parks:

⁹⁸ www.fairfaxcounty.gov/wildlife/sites/wildlife/files/assets/documents/pdf/deer%20management/fy-2011-deer-management-survey-results.pdf

- Burke Lake (71 nests, 407 eggs)
- Huntley Meadows (12 nests, 57 eggs)
- Twin Lakes Golf Course (3 nests, 12 eggs)
- Brookfield Park (3 nests, 14 eggs)
- Royal Lake (7 nests, 36 eggs)
- Fair Ridge Park (1 nest, 5 eggs)

In 2021, 143 nests containing 729 eggs were oiled on properties under the countywide registration held by the FCPD Wildlife Management Specialist office, including: Virginia Department of Transportation (VDOT) properties; the county's Public Safety and Transportation Operations Center; Fair Oaks Mall; Fairfax Corner Shopping Center; Fair Oaks District Police Station; Crosspointe Lake; Pinewood Lake; Manchester Lakes; I-95 Landfill; Penderbrook Golf Course; and various stormwater management ponds. Comparatively, in 2020, 95 nests (477 eggs) were oiled on county parkland and 145 nests (628 eggs) were oiled on other properties countywide by the FCPD Wildlife Management Specialist office.

RECOMMENDATIONS

1. Hiring of Part-Time Wildlife Assistant

Recommendation: 8WM-2021.1 | Status: New this year

Justification and Background:

To assess the need and feasibility of funding or otherwise increasing staff capacity in the Fairfax County Police Department or other county agency for the hiring of a part-time wildlife assistant. EQAC commends the county for its effort to support staffing needs of the Wildlife Management Specialist office within FY2020. Despite staffing increases granted in FY2020, the Fairfax County Deer Management Program and Canada Geese Management Program still requires additional support for public outreach and education efforts. Public interests in wild animal-borne diseases such as chronic wasting disease and the West Nile virus continue to increase. Additional staff would help better facilitate the distribution of valuable information to the public to address public outreach and education needs.

COMMENTS AND CONCERNS

1. Deer Archery Program

EQAC commends the county for continuing and expanding the archery program. Archery is particularly cost-effective, relying on hundreds of qualified volunteers who contribute thousands of hunt hours to the program at a nominal cost. EQAC supports the use of other management methods, such as sharpshooting and managed hunts, when archery is not a viable option.

2. Data Collection for Deer Management

EQAC encourages the FCPA and FCPD to continue to collect and integrate data into discussions about wildlife management. While estimates of population sizes and goals for deer reduction may be challenging to define, both the magnitude of the problem being

addressed and the effectiveness of the applied solutions can be better understood and communicated with data. Being able to present a strong base of information will be a benefit in bringing along stakeholders in the effort to grow various management programs, both in staffing and funding. As the county ultimately seeks to update its current Deer Management Plan or a Comprehensive Wildlife Management Plan, data will be a key component in supporting any proposed recommendations.

3. **Goose Management Limitations**

While the programs currently in place to address the problem of goose overpopulation are good, they would benefit from being replicated much more widely in additional areas of the county. Geese are a major contributor to the pollution of streams and water bodies that are sources of drinking water and that are used for recreational purposes. Further, the county is facing increased restrictions in the Total Maximum Daily Loads of pollutants that may be present in our surface waters (see the Water chapter of this report). Moreover, additional public information campaigns and community outreach efforts are needed to actively involve a larger number of individuals and community organizations in population control programs.

REFERENCES

- Fairfax County Police Department: Emails and data from Katherine Edwards, Fairfax County Wildlife Management Specialist, Ph.D., Certified Wildlife Biologist, June 2021.
- Fairfax County Park Authority: Data provided from John Burke, Natural Resource Branch Manager, July 2021.
- www.fairfaxcounty.gov/wildlife/deer-management-program.
- www.fairfaxcounty.gov/wildlife/geese-management-program.

IX. TECHNOLOGY TO UNDERSTAND THE COUNTY

INTRODUCTION

Technology is critical to understanding Fairfax County's large and complex environment. Among the most critical technologies is a Geographic Information System (GIS), which uses a geographic data model to combine mapping and data management functions. GIS and related information technologies are the focus of this chapter of the Annual Report on the Environment (ARE).

CURRENT STATUS

Reflecting its high-tech economy, Fairfax County was an early adopter of GIS and today is one of the nation's leading counties in applying GIS to its business processes. The substantial returns on this investment are documented in the county's Information Technology plan⁹⁹ and numerous interactive mapping applications are offered to the public¹⁰⁰, including the new JADE viewer¹⁰¹. Enterprise GIS is managed by Geographic Information Systems and Mapping Services, which is a Division of Fairfax County's Department of Information Technology. It is tasked with developing, maintaining, coordinating and distributing GIS/mapping data and technology to Fairfax County government agencies and residents. Supported by this core of expertise, county agencies have been successfully integrating GIS into their business practices.

Many of the county's earliest GIS applications naturally dealt with land use and transportation, where the advantages of GIS are so powerful and obvious. However, GIS also has great application to other environmental areas, including water resources, ecology, wildlife and all forms of pollution and environmental health hazards. In previous versions of the Annual Report on the Environment we detailed some of the important investments Fairfax County made in GIS data and technology. In this more condensed version of the ARE, we look at the continuing effort needed to best employ this valuable and informational resource.

RECOMMENDATIONS

1. LiDAR Capture

Recommendation: 2021-9-1 | Age: 0 years | Status: New this year

The county should fund recapture of LiDAR data in 2022 to provide ongoing data for metrics on tree cover and stream erosion.

Justification and Background:

LiDAR data continues to be a valuable asset in the county. The county's most recent LiDAR data acquisition was flown in December of 2018 at a resolution of 8 points per meter. The LiDAR dataset has already been incorporated into county operations. Fairfax County's

⁹⁹ <https://www.fairfaxcounty.gov/informationtechnology/it-plan>

¹⁰⁰ <https://www.fairfaxcounty.gov/maps/interactive-map-gallery>

¹⁰¹

<https://www.fairfaxcounty.gov/GeoApps/Jade/Index.html?configBase=https://www.fairfaxcounty.gov/GeoApps/Geocortex/Essentials/REST/sites/Jade/viewers/Jade/virtualdirectory/Resources/Config/Default>

Department of Public Works and Environmental Services Stormwater Planning Division (DPWES-SWPD) and Land Development Services (LDS) currently use the LiDAR derivatives for watershed delineation on a daily basis, to measure erosion, and stream bank subsidence. This work is conducted with the tools developed by the GIS Division and LDS staff.

2. GIS Staffing

Recommendation: 2021-9-2 | Age: 0 years | Status: New this year

The county should prepare a plan for fully staffing GIS support positions in FY 2022, with particular attention to Spatial Analyst IV positions.

Justification and Background:

GIS is a growing area and will see higher and more complex demands as time goes by. The county should ensure that the GIS Division and agencies are properly staffed with the personnel to bring GIS fully to bear. GIS positions should be retained and fully staffed if not expanded in FY 2022 in concert with the Enterprise Agreement, new architecture, and capabilities. The GIS Division should be staffed with its full 21-person contingent in FY 2022 and the county should add three additional Spatial Analyst IV positions to address web GIS growth, inter-agency coordination, and mobile technology implementations. Taking full advantage of the GIS investment is only possible when staff resources are available and are constituted of high functioning analysts and architects. Reclass of current positions should be considered to raise expectations of performance and to retain highly skilled staff to serve the environmental interests of the county.

COMMENTS AND CONCERNS

1. Investments in Data

EQAC continues to view investments in GIS datasets as a sound use of resources. Of particular importance are LiDAR (discussed above), aerial photography, and planimetric data.

In 2021 the county initiated a new aerial photography contract with an annual flight schedule. This imagery dataset provides high detail oblique and orthophotography and provides the basis for 3D modelling of buildings and other features. The intelligence provided by these yearly flights supports environmental assessments and help to detect land changes and illegal disturbances. Annual aerial photography should continue so as to gather environmental intelligence.

In late 2021 the county will complete a four-year effort to refresh the planimetric dataset for Fairfax County. This dataset depicts all natural and man-made features on the surface in an electronic model for use in GIS and mapping. The data provides a number of uses in addition to its widespread presence in most mapping applications today. It will be a critical component of the new PLUS system mentioned in Chapter 1, Land Use. Most important for environmental functions is its use to quantify impervious surfaces and as the basis for the creation of other regulatory environmental layers. An annual planimetric

update should be considered to keep the planimetrics up to date and to avoid large time gaps that develop during the current update cycle of 8 years. A system that focuses on areas of change as indicated by the permitting system would allow for identification of specific areas where change has occurred. An up-to-date planimetric dataset will allow engineers and reviewers to examine specific locations and to quantify runoff and imperviousness with high accuracy to resolve complaints and for building reviews.

2. **GIS Resources**

The rapid growth of GIS usage is good, as the connection to productivity is strong. However, EQAC believes supporting this growth and proactively avoiding bottlenecks will require continued investments in hardware, software licenses, and (most importantly) trained staff.

The Enterprise License Agreement (ELA) with the provided infrastructure funds in FY 2021 has facilitated the start of the GIS Modernization. The GIS Database is being prepped for a move to Structured Query Language (SQL) where disaster recovery, resiliency and backup will be fully employed. The Enterprise Portal upgrade is currently being deployed which will be scaled for performance, capacity, and resiliency. These changes once completed in FY 2022 will give the county a stable business class GIS system. All additional capabilities will be deployed in FY 2022 and 2023.

Additional funds will be needed to in FY 2023 to ensure that Fairfax County will be able to pilot emerging new software that is not part of the ELA and acquire additional named user licenses as required. A request for some funding will be included in the FY 2023 Geospatial Initiatives submission to cover these expenses in the amount of \$50,000.

Investment is still needed by agencies in smartphones that can be used remotely while connected to the FFX network to access GIS-centric applications and workflows from the Enterprise Portal. As new systems with GIS mobile components are adopted the county needs to ensure that these devices are not neglected to support these systems or general GIS field use.

3. **Public Access to GIS**

Today, of the 93+ applications in the county GeoPortal, 36 are environmentally focused. In FY 2021, nineteen new applications were deployed to the public, a 20% increase in total applications. These applications continue to see widespread use both inside and outside the government and are a testament to county staff efforts at openness and public communication.

The JADE application has seen rising use in the past year. Table 1 shows sessions across two periods compared to the well trafficked internal viewer, the GEM.

Table 1. Sessions of GEM (internal) and JADE (public) in FY 2021 and FY 2022.

GEM use increased by 22% and JADE 44%.

	Sessions FY 21	Sessions FY 22	% Change
GEM (internal)	160771	195733	22%
JADE (public)	92324	133154	44%

In FY 2022, the JADE will be redeployed to new architecture where the public will enjoy better performance and high availability. With increasing utilization, it is important to scale the system to meet this rising use before performance bottlenecks appear. The server pairing will ensure that the JADE is fault tolerant through server redundancy. The JADE will also be enhanced to take advantage of new report types and formats, as well as new workflows. JADE will also receive an aerial photography update from spring 2021 that will include both orthos and obliques. A survey will be conducted in FY 2022 to solicit feedback from the public so as to respond to needs that may exist. These changes will make the JADE a more responsive system and user-friendly system. EQAC supports continued development of JADE, with particular attention to any comments developed from public feedback in FY 2022.

APPENDIX A

Spotlight on Fairfax County Public Schools



OVERVIEW

This Spotlight describes recent achievements by Fairfax County Public Schools (FCPS) and upcoming plans for climate and energy; waste management; and Get2Green. As available, it identifies specific schools and facilities where achievements have taken place. The Spotlight does not include any recommendations for the Fairfax County Board of Supervisors.

FCPS is one of the largest school divisions in the United States, serving more than 188,000 students with 198 schools and centers. This spotlight identifies relevant components of the updated Fairfax County Environmental Vision (adopted in June 2017) and describes recent efforts to address those components. The vision includes FCPS in the following four sections: (1) Transportation; (2) Waste; (3) Climate and Energy; and (4) Environmental Stewardship.

FCPS highlights “resource stewardship” as one of the goals of its strategic plan (“Ignite”); this is in addition to goals covering student success, caring culture, and a premier workforce. FCPS addresses such stewardship activities through policies and regulations.

FCPS has multiple departments and offices that have activities relevant to environmental topics. These include Facilities and Transportation Services; Food and Nutrition Services; Instructional Services; Office of Design and Construction; Office of Facilities Management; and Office of Safety and Security.

In the past year, FCPS has continued its efforts to prioritize systems and practices that maximize energy efficiency and provide for a cost-effective transition to clean and renewable alternatives to fossil fuels. In April 2019, Fairfax County’s Joint Environmental Task Force (JET) was jointly created by the Fairfax County Board of Supervisors and the FCPS Board. The JET’s mission is to *“join the political and administrative capabilities of the county and the school system to proactively address climate change and environmental sustainability”*¹⁰².

The JET recommended that the FCPS board should commit to being energy carbon neutral by 2040. Further, that the FCPS board should achieve 50% emissions reductions by 2030 as compared to a 2019 baseline, and that the FCPS bus fleet be transitioned to electric alternatives by 2035. In the past two years, FCPS hired 10 full-time Energy Education Specialists to perform energy management, conservation, and educational services. FCPS continued to provide an updated public website with school-by-school energy and recycling data. Additional information about this is at <http://get2green.fcps.edu/>. Interested members of the community can obtain

¹⁰² The JET issued a final report on October 1, 2020. <https://www.fairfaxcounty.gov/environment-energy-coordination/joint-environmental-task-force>

energy usage data and other relevant information for specific schools at that site. Information about impacts from COVID-19 on FCPS energy use (e.g., for reduced use of school buildings) was not provided for the 2021 Annual Report on the Environment (ARE). In addition, updated information about FCPS efforts related to stormwater management, potable water quality (i.e., testing for lead in school drinking water systems), and transportation also were not provided for the 2021 ARE. Readers can refer to the 2019 ARE for information about those activities.

Background information about the FCPS bus fleet was provided in the JET report. FCPS has a fleet of 1,625 diesel buses, each with an average age of 18 years at the time of replacement. As of May 2021, there were 555 buses within five years of the average replacement age. In addition to the bus fleet, the school division has 816 non-bus vehicles, including large service trucks. The average age for a non-bus vehicle replacement is 12 years; 419 non-bus vehicles were within five years of the average replacement age. FCPS received eight electric buses through a Dominion Energy initiative which were placed in service in May 2021 and have begun transporting students. None of the remaining FCPS vehicles (bus/non-bus) are hybrid or electric.

A Fairfax County Zero Waste Planning Team with staff from FCPS and county agencies have been meeting since early 2021 to draft a plan for reaching zero waste in county and school operations by 2030, and the plan is scheduled to be finalized in fall 2021. Waste audits were conducted in April to assess the current waste stream composition at a diverse array of facilities. Additional information can be found in the Waste Management chapter of the ARE.

OUTREACH

County Agencies and Local Organizations

FCPS works closely on storm water management projects with the Department of Public Works and Environmental Services. FCPS also collaborates with the Office of Environmental and Energy Coordination, the Fairfax County Park Authority, the Northern Virginia Soil and Water Conservation District, and the Fairfax Food Council on environmental education and outreach programs.

Other Authorities or Actors

FCPS works with the U.S. Environmental Protection Agency (EPA) through the ENERGY STAR^{®103} program (<https://www.energystar.gov/>), the Metropolitan Washington Council of Government through their Regional Climate and Energy Action Plan¹⁰⁴ (released in March 2017) and the U.S. Department of Energy (DOE) through their Better Buildings Challenge¹⁰⁵.

Get2Green also collaborates with a variety of community partners, including the National Wildlife Federation, Chesapeake Bay Foundation, George Mason University, NoVA Outside, Master Gardeners, and the U.S. Green Building Council Center for Green Schools, to offer

¹⁰³ <https://www.energystar.gov/>

¹⁰⁴ <https://www.mwcog.org/documents/2017/03/23/regional-climate-and-energy-action-plan-climate--energy-climate-change-energy/>

¹⁰⁵ <https://betterbuildingssolutioncenter.energy.gov/challenge>

professional development opportunities for teachers, support student learning on environmental topics, share resources to support student-led environmental action, and promote best practices for school-based environmental stewardship.

Community

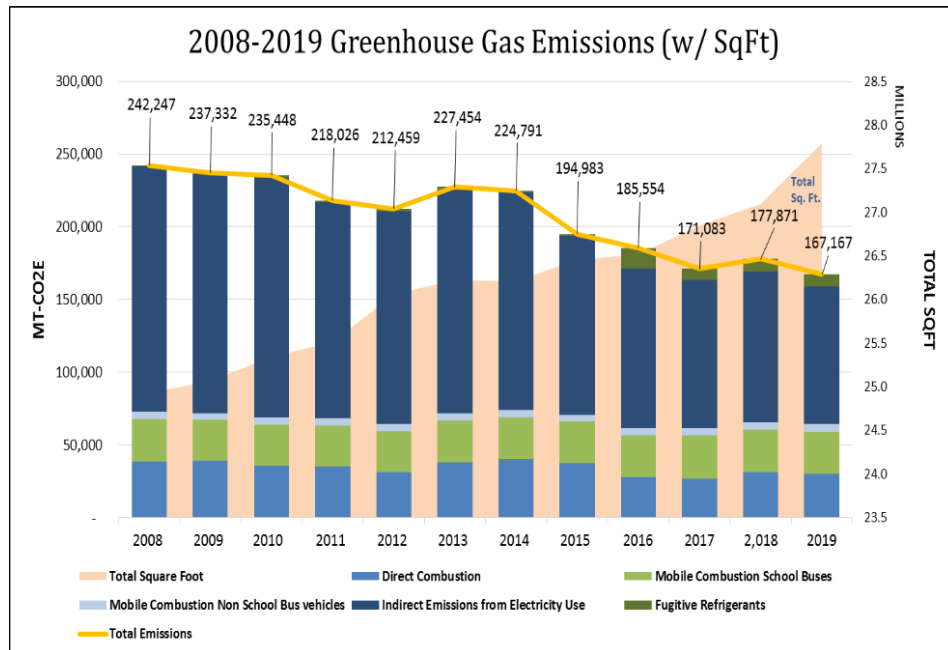
Get2Green provides a newsletter and maintains an active social media presence on Twitter to share sustainability events and resources. Get2Green has more than 8,000 newsletter subscribers and 900 Twitter followers.

ENERGY EDUCATION

FCPS facilities include over 27 million square feet of occupied space for education, support, and administration functions. The FCPS energy education program has yielded the following reductions in energy use and greenhouse gas emissions:

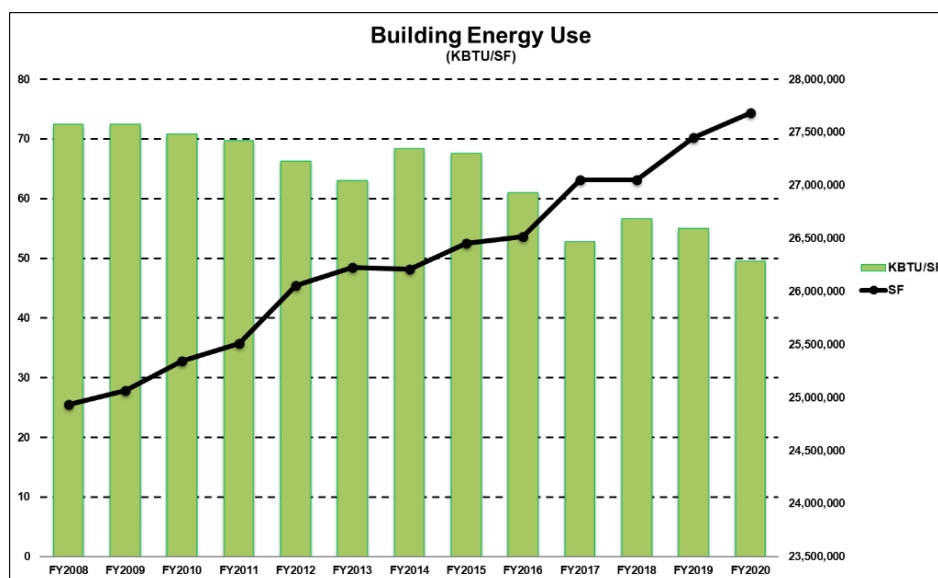
- Reduced Energy Use: According to the DOE’s Better Buildings Program, in 2021 FCPS achieved an annual reduction of 25 percent in total energy use division-wide compared to 2014.
- Savings from Energy Use Reductions: A cumulative cost savings of more than \$50 million has resulted from the reduced energy consumption since 2013.
- A Significant Reduction in Greenhouse Gas (GHG) Emissions (as shown in Figure B-1): FCPS has reduced GHG equivalent emissions (CO₂e) by more than 75,000 metric tons of CO₂e from 2008 to 2019 (a 30 percent reduction over a nine-year period).

Figure B-1. Greenhouse Gas Emissions and Occupied Space in FCPS Facilities



Energy Use Intensity (EUI), the energy use of a building per square foot has been declining across all FCPS facilities. In FY 2020, the EUI of FCPS was 49 kilo British thermal units (KBtu), compared to 77 KBtu in FY 2004, a 36 percent reduction (see Figure B-2). These energy reductions (total and per square foot) have been achieved despite the addition of school building space to accommodate increasing student membership. Growth in student membership was nearly 30,000 between 2008 and 2020 and FCPS added almost 2.75 million square feet of education space to accommodate that growth.

Figure B-2. FCPS Energy Use per Square Foot and Number of Square Feet



FCPS' accomplishments with energy and sustainability were recognized by the EPA:

- **ENERGY STAR Certified School Buildings:** FCPS achieved 94 ENERGY STAR certifications in 2020. FCPS has earned 673 certifications in total, since FCPS began certifying buildings. 185 FCPS schools have earned an ENERGY STAR for at least one year.
- **National Recognition for Energy Efficiency:** FCPS has earned the ENERGY STAR Partner of the Year award for five years (2017-2021). The award is given by the U.S. EPA in recognition of superior energy and sustainability performance and practices¹⁰⁶.

As required by School Board Policy 8542 (Environmental Stewardship), FCPS has prepared an annual GHG Inventory report (reports for years 2013 through 2019 are available online¹⁰⁷). Policy makers use GHG inventories to track emission trends, develop strategies and policies, and assess progress. Operations managers use GHG inventories to evaluate a program's impact and to prioritize projects. Scientists use GHG inventories as inputs to atmospheric and economic models.

¹⁰⁶ https://www.energystar.gov/about/content/fairfax_county_public_schools_3

¹⁰⁷ <https://www.fcps.edu/about-fcps/performance-and-accountability/energy-management-program/greenhouse-gas-inventory>

After concluding its contract with Cenergistic, Inc. in July 2019, FCPS created the Energy Education program and hired 10 full-time Energy Education Specialists to perform energy management, conservation, and educational services division wide. FCPS has reduced anticipated energy costs by more than \$50 million through this conservation program.

In FY 2020, FCPS spent over \$33,000,000 on its electric, oil, gas, and water utilities. The Office of Facilities Management is tasked with keeping this bill as low as possible through development and implementation of conservation programs. The energy management section has been installing and operating central control and monitoring systems in FCPS buildings since 1978. These systems range in sophistication from automated start/stop programming to web-integrated Direct Digital Control with operator interface graphic software. These systems have a life span of approximately 17 years and are replaced on a rotating cycle when funding permits. The energy management section currently operates about 240 computerized Energy Management Systems. In addition, the energy management section provides in-house training sessions to school-based custodians, school-based operating engineers, and Heating, Ventilation, and Air Conditioning (HVAC) maintenance technicians.

Each year, FCPS monitors thousands of utility bills at 222 locations using EnergyCAP, a third-party accounting software. Energy Education Specialists evaluate energy consumption data, looking for and correcting anomalies in usage and billing errors. Facilities are audited regularly to identify potential improvements in energy use, developing and implementing energy saving projects. Data is gathered from a variety of sources including utility bill databases, metering data, building benchmarking, control system historical trends, interviews with building staff, and field observations.

To contribute to enhancing the pace of energy-related improvements at existing FCPS schools and other facilities, the Office of Facilities Management is in the process of planning Energy Savings Performance Contracts (ESPCs). Such contracts will enable the completion of urgently needed energy improvement projects that have been unfunded due to budget constraints including replacing inefficient HVAC equipment still in use beyond its useful life (e.g., chillers and boilers), old inefficient structural components (e.g., single pane, metal framed windows with no thermal breaks), and inefficient and poor-quality fluorescent and High Intensity Discharge lighting. ESPCs will enable FCPS to accelerate replacement of these items with more efficient replacements such as LED lighting, condensing boilers, high efficiency chillers, insulated windows, and shell air sealing. The money to pay for this will come from energy cost savings achieved by those improvements, and those savings will be guaranteed to FCPS by the energy savings contractors for the projects.

FCPS recently amended its Capital Improvement Program to expand the commitment to renewable energy resources and continues to assess the viability of renewable energy for future projects, addressing each on a case-by-case basis. In 2019, FCPS joined Fairfax County in its development of the Solar Power Purchase Agreement (PPA) Request for Proposal (RFP) from companies providing solar PPAs. FCPS' Office of Facilities Management maintained close contact with county staff throughout the RFP development process. As of this writing, the Solar PPA has been issued by the county and the procurement process is proceeding with PPA contractors.

FCPS currently has ten schools with solar installations. Roof-mounted photo-voltaic solar arrays paid for through grants and fundraising can be found at Rachel Carson Middle School, Frost Middle School, Canterbury Woods Elementary, Bailey’s Elementary School, and Thomas Jefferson High School. Roof-mounted solar installations for solar thermal heating of potable (drinkable) water can be found at Glasgow Middle School, West Springfield High School, and Thomas Jefferson High School. Franklin Sherman Elementary has a ground-mounted photo-voltaic array. Experimental instructional projects integrating technology include a solar powered wind turbine at Lanier Middle School and a chicken coop with solar panel heat at Twain Middle School. Although these projects do not supply large amounts of energy to the schools, they serve as valuable educational tools.

GET2GREEN PROGRAM

Get2Green is the interdepartmental environmental stewardship program for FCPS with the mission to promote student learning and action using the environment as a foundation. Get2Green supports division-level policies and projects that complement school-based sustainability work with a goal of providing equitable access to environmental and outdoor learning opportunities. Get2Green staff offers personalized support for classes and eco-teams implementing hands-on environmental action in their school and community.

Schools engage with Get2Green in many different ways, including Get2Green’s incentive programs, extracurricular activity, entire classes or grade-levels, or through a developed culture of sustainability in their school community. Get2Green works closely with content area specialists to incorporate sustainability into existing curriculum. Sustainability work is also implemented through Get2Green’s close collaboration with Project-Based Learning and Science, Technology, Engineering, Arts, and Mathematics. Get2Green actively participates on the Global Classroom Project (GCP) team supporting school teams with resources and staff support, as each school-based GCP classroom incorporates a United Nations Sustainable Development Goal as a backbone of their project.

Student eco-teams are active at many schools engaging in stewardship activities such as reducing waste, conserving energy, planting and maintaining wildlife habitat, and tending edible gardens. Get2Green has an Ignite Partnership with the National Wildlife Federation (NWF). NWF’s Eco-Schools USA program provides a framework for schools to engage in student-led environmental action by conducting audits, creating action plans, and earning recognition of bronze, silver or green flag awards. Schools can choose from twelve environmental pathways to address through Eco-Schools. Project Learning Tree’s GreenSchools program and Virginia Naturally are other green school frameworks used in FCPS that also offer schools recognition for their green achievements. Some schools also use their own structure for organizing their green work.

The Get2Green website provides data, guidance, and resources for students and teachers to engage in environmental stewardship. Get2Green’s close interdepartmental collaboration between instruction and facilities is evident through the website’s data dashboards featuring energy, water, greenhouse gas, and recycling data for each school and the division for use by teachers and students. Get2Green shares sustainability news, engagement opportunities,

professional development offerings, opportunities for students, grants, and resources through a monthly newsletter and social media.

Get2Green has one staff member in Facilities and one in Instructional Services. The Get2Green staff collaborates with county and community partners, serves on committees supporting sustainability in FCPS and across Fairfax County including the JET, applies for and manages grants to support schools, and hosts programs such as Earth Week to expand engagement in environmental stewardship. Get2Green also provides professional development opportunities for educators and administrators to ensure all students have opportunities to develop as ethical and global citizens.

To support the FCPS Food and Nutrition Services (FNS) Farm to School initiative, Get2Green collaborated with FNS to develop, package and distribute Grow at Home kits to students at meal distribution sites last summer. Get2Green was awarded grant funding for another round of Grow at Home in spring 2021. An additional 5,472 kits were distributed through teachers to enable students to plant, grow, harvest, prepare, and eat their own green beans. The demand for the kits far outnumbered the availability.

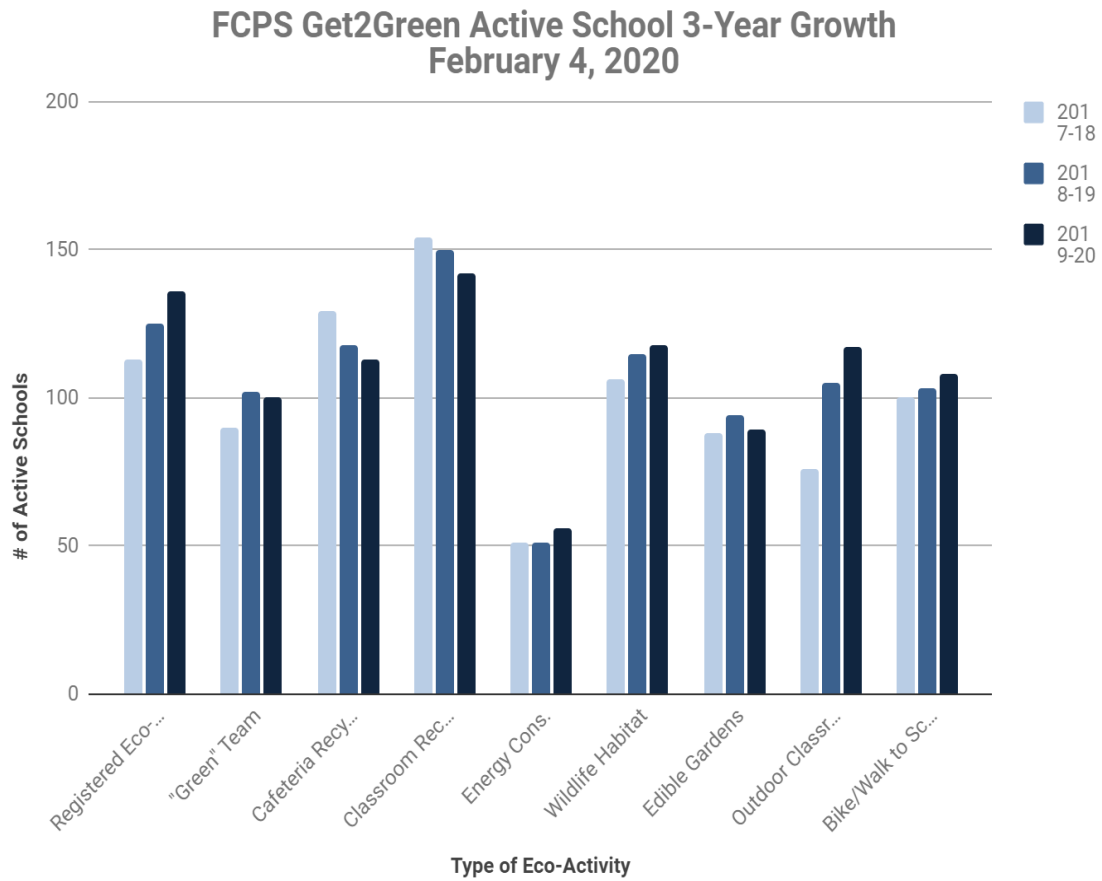
Get2Green's Earth Week 2021 programming focused on connecting people to nature to improve mental health, reduce stress, and encourage a sense of wonder about the world around us. Past Get2Green Earth Week activities have been adapted by school districts across the country and used by students internationally.

While Get2Green supports schools in complying with FCPS regulations and policies, including Regulation 8541 Recycling Requirements for all FCPS Facilities and Policy 8542 Environmental Stewardship, engagement with Get2Green is voluntary and schools are not currently mandated to participate in Get2Green programming. Get2Green has seen tremendous success and growth as a grassroots program.

Get2Green annually surveys schools in an effort to inventory participation in sustainability and stewardship programming. The self-reported inventory data includes whether a school engages students in environmental stewardship through a green team, recycling, composting, food sharing, energy conservation, wildlife habitat, or edible garden. Get2Green did not conduct this survey in SY 2020-21, but [historical data is available on the Get2Green website](https://get2green.fcps.edu/archivedata.html) (<https://get2green.fcps.edu/archivedata.html>). The survey will be evaluated and updated in 2021 to better capture the degree of participation at schools.

At the end of 2020, FCPS had 139 registered Eco-Schools through the National Wildlife Federation's Eco-Schools USA program. Seventeen of these schools have achieved Green Flag status, the highest honor in that program. The Green Flag schools are Belvedere ES, Centreville ES, Chesterbrook ES, Churchill Road ES, Daniels Run ES, Flint Hill ES, Franklin Sherman ES, Frost MS, Haycock ES, Lake Anne ES, Lanier MS, Longfellow MS, Marshall HS, Providence ES, Rachel Carson MS, Riverside ES, and Rocky Run MS. Figure B-3 shows how participation in school-based eco-activities has grown each year for 2017-2019 (data reported as of February 4, 2020; data were not collected in 2020 due to the COVID-19 pandemic).

Figure B-3. Participation in School-Based Eco-Activities



APPENDIX B

Environmental Stewardship/Volunteer Opportunities in Fairfax County

Board of Supervisors Environmental Vision:

An informed community works together with Fairfax County and its partners to care for and responsibly manage our treasured natural resources. In partnership, Fairfax County will continue to coordinate and promote education and outreach programs that encourage personal stewardship and promote initiatives at a countywide level.¹⁰⁸

Introduction

Environmental quality is a team effort. We need partnerships with government, commercial and volunteer organizations to strive to improve our environment as is described throughout this annual report. There are a number of organizations focused on stewardship efforts and best practices supporting government and non-government resources and broader environmental needs. This section is provided to highlight a group of governmental and non-governmental opportunities that individuals or organizations might consider supporting with their time and focus. Many of these organizations rely on volunteer resources to be effective, and greater participation may allow the organizations to expand the scope of their current work. EQAC does not assert that these are the only organizations making a valuable contribution to our environment. Some government organizations are listed if they either organize environmental activities or provide a good source for members of the community who want to contribute their time to improving environmental quality.

1. ALICE FERGUSON FOUNDATION

<http://fergusonfoundation.org/>

The Alice Ferguson Foundation's flagship volunteer opportunity is their annual Potomac River Watershed Cleanup held throughout the Washington, D.C. metro area each April (www.potomaccleanup.org).

¹⁰⁸ 2017 Fairfax County Environmental Vision, Section 2 G, pg. 31,
www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf

2. CLEAN AIR PARTNERS

www.cleanairpartners.net/

Clean Air Partners strives to improve public health and the environment by working with businesses, organizations and individuals throughout the region to raise awareness and reduce air pollution through voluntary actions. While some of the metropolitan Washington area's ozone problem originates outside of the area and is beyond the control of Virginia, Maryland and the District of Columbia, there are many aspects of our daily lives that can affect the quality of our air. Their "Get Involved" section of the Clean Air Partners website offers many opportunities for taking action.

3. CLEAN FAIRFAX

www.cleanfairfax.org/volunteer-opportunities/

Clean Fairfax is a local nonprofit that encourages environmental stewardship and sustainability in Fairfax County through education, programming and community engagement. Working in close collaboration with county agencies, Clean Fairfax aims to reduce littering and to encourage recycling, reusing and reducing consumption through community clean-ups and sustainable business consultations. Clean Fairfax can help you organize a successful clean up in the spring or fall where they supply all the necessary tools (gloves, trash bags, recycling bags, vests and safety tips as well as assistance in large scale pickups by connecting residents with the county's trash pickup program). Clean Fairfax also organizes and leads the Earth Day/Arbor Day event called SpringFest Fairfax (www.springfestfairfax.org), in partnership with the Department of Public Works and Environmental Services and the Fairfax County Park Authority.

4. EARTH SANHGA

www.earthsangha.org/volunteer

Earth Sangha is a non-profit public charity which operates a volunteer-based program to propagate local native plants, restore native plant communities and control invasive alien plants. Volunteer opportunities exist at Earth Sangha's Wild Plant Nursery (the region's most comprehensive effort to propagate native plants directly from local forests and meadows) as well through other ecological restoration events (e.g. invasive plant removal or planting work days).

5. ENERGY ACTION FAIRFAX

www.fairfaxcounty.gov/energy/energyactionfairfax/

Energy Action Fairfax develops and implements outreach initiatives across Fairfax County to help residents, businesses and county employees save energy and money.

Residential outreach is done through events, presentations, a quarterly newsletter and a website. Energy Action Fairfax also coordinates special initiatives such as the Thermal Camera Loan Program, LED Exchanges and Solarize Fairfax County. Business outreach is done through the Green Business Partners program, which offers recognition to county businesses with sustainable practices and resources to businesses looking to become more sustainable. Employee outreach is done through Fairfax Employees for Environmental Excellence, which hosts awareness events and an internal county webpage. Energy Action Fairfax can be reached at energyactionfairfax@fairfaxcounty.gov.

6. FAIRFAX COUNTY DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL SERVICES

www.fairfaxcounty.gov/dpwes/stormwater/

There are numerous opportunities throughout the year to participate in stream cleanups, storm drain labeling, volunteer water quality monitoring and tree planting projects. DPWES-Stormwater Management provides links to information about these popular volunteer programs on its website. For a list of common household hazardous materials and how to dispose of them, go to www.fairfaxcounty.gov/publicworks/recycling-trash/household-hazardous-waste

7. FAIRFAX COUNTY PARK AUTHORITY

www.fairfaxcounty.gov/parks/volunteer/
<https://www.fairfaxcounty.gov/parks/park-volunteer-team>

The Fairfax County Park Authority (FCPA) offers a number of opportunities for volunteers via the above websites and information about its programs is available from the “Programs and Activities” menu on this website. Opportunities include, but are not limited to, engaging in programming, leading walks and tours, writing fliers or brochures, answering the phone when a resident calls with an environmental question and/or hands-on resource management, cleanup events, habitat restoration events, being a park volunteer team lead, and wildlife monitoring (e.g. birds, amphibians). Monetary donations to the Fairfax County parks can be accepted through the nonprofit Fairfax County Park Foundation (www.fairfaxparkfoundation.org).

8. FAIRFAX COUNTY RESTORATION PROJECT

<http://www.fcrpp3.org/>

The Fairfax County Restoration Project (FCRP) strengthens the relationship between people and nature through community action. FCRP connects, creates and promotes efforts to restore ecosystem functions in Fairfax County through collaboration with public, private and volunteer organizations.

9. FAIRFAX RELEAF

www.fairfaxreleaf.org

Volunteers plant and preserve trees, improve community appearance and restore habitat on public and commons lands in Northern Virginia.

10. NATIONAL PARK SERVICE, THE

www.nps.gov/getinvolved/volunteer.htm

The National Park Service has many ways you can help care for your national parks, from one-time to reoccurring volunteer opportunities for youth, families, groups and individuals.

11. NATURE CONSERVANCY, THE

www.nature.org/en-us/get-involved/how-to-help/volunteer-and-attend-events/

Opportunities local to Fairfax County may vary, but more broadly volunteers can participate in projects ranging from visitor outreach to monitoring preserves.

12. NORTHERN VIRGINIA CLEAN WATER PARTNERS EFFORTS TO MANAGE PET WASTE, THE

<https://www.novaregion.org/408/Clean-Water-Partners>

Northern Virginia Clean Water Partners is a group of 19 Northern Virginia local governments, school systems, independent water and sanitary sewer authorities and local businesses that are concerned with local water quality. Examples of the activities of this group include its Dog Blog and Facebook pages for dog owners. Clean Water Partners also provides sustainable landscaping, home and vehicle tips.

13. NORTHERN VIRGINIA CONSERVATION TRUST

<http://nvct.org/get-involved/volunteer/>

NVCT holds numerous volunteer events each year focused on restoring habitats in Northern Virginia including invasive plant removals, tree plantings, trash removals and much more.

14. NORTHERN VIRGINIA REGIONAL PARK AUTHORITY (NOVA PARKS)

www.novaparks.com/event-category/community-volunteers

For the environmentally-conscious park enthusiast, we recommend contacting

NOVA Parks (the Northern Virginia Regional Park Authority). Environmental stewardship opportunities for volunteers, including shoreline, trash and trail clean-ups and invasive plant removals, are available at Meadowlark Botanical Gardens, Potomac Overlook Regional Park, Upton Hill Regional Park, Pohick Bay Regional Park and various other parks on occasion. NOVA Parks has implemented a program that allows youths to access its fee-based park facilities through volunteer service. It has a wide variety of community partnerships in place that encourage groups to take advantage of the regional parks for environmental and historic education and service projects.

15. NORTHERN VIRGINIA SOIL AND WATER CONSERVATION DISTRICT
www.fairfaxcounty.gov/nvswcd/

The Northern Virginia Soil and Water Conservation District (NVSWCD) supports numerous opportunities throughout the year to participate in stream cleanups and restorations, storm drain labeling, rain barrel workshops, native seedling sales, volunteer water quality monitoring and tree planting projects. NVSWCD is also a good resource for advice to homeowners on problems with ponds, eroding streams, drainage, problem soils and other natural resource concerns. The Conservation Assistance Program may be able offer financial assistance for energy or watershed conservation projects on private land.

16. PLANT NOVA NATIVES
www.plantnovanatives.org/work-with-us

Plant NOVA Natives is a joint marketing campaign of non-profit, governmental and private groups which encourages residents as well as public and commercial entities in Northern Virginia to install native plants as the first step toward creating wildlife habitat and functioning ecosystems on their own properties. The organization has opportunities to volunteer supporting its mission internally as well as doing direct outreach in the community.

17. POTOMAC CONSERVANCY, THE
<http://potomac.org/>

Get involved in The Potomac Conservancy's mission to establish a foundation of healthy, sustainable and connected communities through ensuring access to clean water. Opportunities include seed collection and tree plantings as well as river cleanups and restoration.

18. RESTON ASSOCIATION

www.reston.org/AboutRestonAssociation/VolunteerOpportunities/VolunteerOpportunitiesOverview/tabid/435/Default.aspx

Volunteer opportunities in this homeowner's association of 60,000 residents include seasonal cleanups, stream monitoring, wildlife counts and bird box monitoring.

19. VIRGINIA MASTER NATURALIST PROGRAM, FAIRFAX CHAPTER

<https://fairfaxmasternaturalists.org/>

The Virginia Master Naturalist Program is a statewide corps of volunteers providing education, outreach and service dedicated to the beneficial management of natural resources and natural areas within their communities. Interested Virginians become Master Naturalists through training and volunteer service.

20. VIRGINIA OUTDOORS FOUNDATION

www.virginiaoutdoorsfoundation.org/volunteer/

Be part of the most successful land conservation program in Virginia. Help fulfill Virginia Outdoors Foundation's mission to preserve open spaces for future generations by becoming a volunteer. With eight offices across the commonwealth, volunteer opportunities include conservation easement monitoring, field assistance, office assistance, courthouse research, land management assistance, exhibit staffing /event assistance and communications assistance.

APPENDIX C

How to Report Environmental Crimes or Concerns in Fairfax County

TTY 711 for all phone numbers

Type of Incident	Phone Number
<u>RELEASE OF HAZARDOUS MATERIALS INTO THE ENVIRONMENT - ACTIVE RELEASE, DANGEROUS, OR UNKNOWN</u> If the dumping of any substance into a stream, into a manhole, into a storm drain, 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
<u>RELEASE OF HAZARDOUS MATERIALS INTO THE ENVIRONMENT - NO IMMEDIATE DANGER</u> If a known discharge of hazardous materials has occurred in the past and no lives or property are in immediate danger; this should be reported to the Fairfax County Fire and Rescue Department's Fire and 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.	703-246-4386 (working hours) 703-691-2131 (after hours)
<u>RELEASE OF ANY MATERIAL INTO THE ENVIRONMENT</u> 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 OR 911
<u>ILLEGAL DUMPING</u> While any of a number of county and/or state agencies may ultimately have authority over dump sites, depending on circumstances, the Department of Code Compliance is an intake center for complaints (call or visit www.fairfaxcounty.gov/code).	703-324-1300
<u>LAND CLEARING; TREE REMOVAL; DUMPING OF FILL</u> To report the suspected illegal removal of trees, clearing of land, digging or dumping of fill dirt, contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code .	703-324-1300

Type of Incident	Phone Number
<u>SOIL EROSION</u> To report soil erosion from private properties or construction sites, call the Hotline of the Site Development and Inspection Division of Land Development Services or visit https://www.fairfaxcounty.gov/landdevelopment/site-development to submit a complaint online.	703-324-7470
<u>GENERATION OF DUST FROM CONSTRUCTION, GRADING, OR LAND CLEARING</u> Contact the Virginia Department of Environmental Quality, Northern Regional Office.	703-583-3800
<u>TRASH/DEBRIS ON CONSTRUCTION SITES</u> Call the Hotline of the Site Development and Inspection Division of Land Development Services or visit https://www.fairfaxcounty.gov/landdevelopment/site-development to submit a complaint online.	703-324-7470
<u>CONSTRUCTION NOISE</u> To report construction noise outside between 9 p.m. and 7 a.m. on Sunday through Thursday, or between 9 p.m. and 9 a.m. on Fridays, Saturdays, and the day before federal holidays, contact the following: <ul style="list-style-type: none"> • If the construction activity is occurring at the time of the complaint, call the Fairfax County Police non-emergency number. • Otherwise, if the construction activity is ongoing or recurring, call the Department of Code Compliance, or visit www.fairfaxcounty.gov/code. 	703-691-2131 703-324-1300
<u>NOISE IN A RESIDENTIAL AREA</u> To make a complaint about noise from animals, amplified sound, vehicles, or people, contact the following: <ul style="list-style-type: none"> • If the noise is currently occurring during non-business hours in a residential area, call the Fairfax County Police non-emergency number. • Otherwise, if the noise is ongoing or recurring, call the Department of Code Compliance, or visit www.fairfaxcounty.gov/code. 	703-691-2131 703-324-1300
<u>TRASH COLLECTION BETWEEN 9:00 P.M. AND 6:00 A.M.</u> Call the Department of Public Works and Environmental Services. If possible, provide descriptive information about the truck, such as name of company, color, truck number, and license plate number.	703-324-5230
<u>OTHER SOLID WASTE COMPLAINTS ASSOCIATED WITH WASTE COLLECTORS/HAULERS</u> Call the Department of Public Works and Environmental Services. If possible, provide descriptive information about the truck, such as name of company, color, truck number, and license plate number.	703-324-5230

Type of Incident	Phone Number
<u>ACCUMULATION OF SOLID WASTE WITHIN BUILDINGS (E.G., TRASH CHUTES IN DISREPAIR)</u> <u>TO REPORT A COMPLAINT, CONTACT THE DEPARTMENT OF CODE COMPLIANCE, OR VISIT WWW.FAIRFAXCOUNTY.GOV/CODE.</u>	703-324-1300
<u>SIGNS ON ROADS AND MEDIANS</u> If a sign on a road or median poses a safety hazard, you may contact the Virginia Department of Transportation at this phone number or through https://my.vdot.virginia.gov/ . Fairfax County performs monthly collections of illegal roadway signs on certain designated roads. More information can be found at www.fairfaxcounty.gov/code/signs .	1-800-367-7623 (1-800-FOR-ROAD)
<u>SIGNS ON PRIVATE PROPERTY</u> There are restrictions for signs on private property. To report a complaint, contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code .	703-324-1300
<u>POORLY MAINTAINED HOMES OR OTHER BLIGHTED PROPERTIES</u> To report problems including broken windows and gutters, junk or debris in yards, and tall uncut grass, contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code .	703-324-1300
<u>ABANDONED VEHICLES (FIVE OR FEWER)</u> Contact the Fairfax County Police Department's Traffic Division Impound Section; e-mail: FCPDJunkVehicle@fairfaxcounty.gov .	703-280-0716
<u>ABANDONED VEHICLES (SIX OR MORE)</u> Contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code .	703-324-1300
<u>OUTDOOR LIGHTING CONCERNS</u> To report problems with glare, overlighting, or other issues, contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code .	703-324-1300
<u>AIR POLLUTANTS</u> Air pollutants are emitted by stationary sources, such as power plants, gasoline service stations, and dry cleaners, as well as by mobile and area sources, such as from automobiles, trucks, and other highway activities. This phone number is for the Virginia Department of Environmental Quality Northern Regional Office.	703-583-3800 After hours, call 1-800-468-8892

Type of Incident	Phone Number
<p><u>NO RECYCLING IN SCHOOLS</u></p> <p>Section IX of the Fairfax County School Board’s Policy 8541 states that <i>“Schools and centers will have mandatory recycling programs for paper products, cans, and bottles. Construction waste materials will be separated and recycled.”</i> To report schools that are not recycling in accordance with this policy, contact the Fairfax County Public Schools Office of Facilities Management, Plant Operations Section. More information is available at: https://www.fcps.edu/node/27868.</p>	703-764-2459
<p><u>BUSINESS OR RESIDENTIAL RECYCLING</u></p> <p>To report a suspected violation of recycling requirements (whether residential or business), contact the Department of Public Works and Environmental Services - Solid Waste at the phone number provided or through the Solid Waste Feedback Form at https://www.fairfaxcounty.gov/publicworks/recycling-trash/solid-waste-feedback-form.</p>	703-324-5230
<p><u>HEALTH HAZARDS</u></p> <p>For information and guidance on a suspected environmental hazard that may pose a public health risk, call the Health Department’s Division of Environmental Health. These hazards include unburied dead animals; rat infestations, and mosquito breeding sites.</p>	703-246-2201
<p><u>MEDICAL WASTE</u></p> <p>Improper storage or disposal of medical waste should be reported to the Virginia Department of Environmental Quality. This phone number is for the Northern Regional Office.</p>	<p>703-583-3800</p> <p>After hours, call 1-800-468-8892</p>
<p><u>WILDLIFE/ANIMAL CONTROL ISSUES</u></p> <p>Contact the Police Department’s non-emergency dispatch number.</p>	703-691-2131