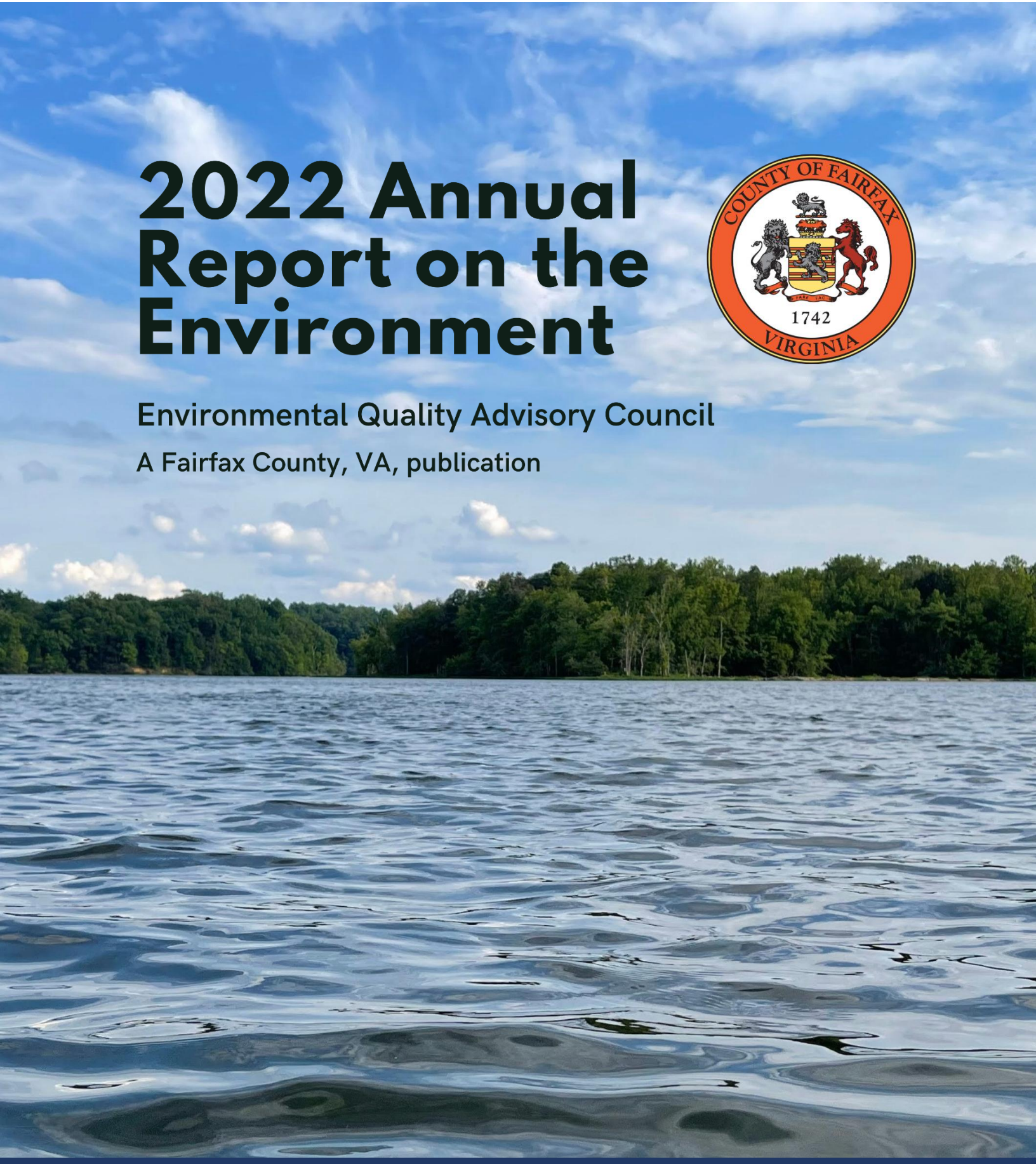
2022 Annual Report on the Environment

Environmental Quality Advisory Council

A Fairfax County, VA, publication



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The Cover Photo was taken at the Occoquan Reservoir at Fountainhead Regional Park in Fairfax County.

Cover design and photo by
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ANNUAL REPORT
on the
ENVIRONMENT

2022

Fairfax County, Virginia

Environmental Quality Advisory Council

December 2022

Printed on FSC-certified paper with recycled content

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INTRODUCTION

EQAC acknowledges the myriad challenges facing the county's residents and the environment in the coming years. We also note that we have an astute Board of Supervisors and a very talented staff that are poised to meet those challenges when so directed by the BOS.

These challenges are often complex and overlapping, and climate change and its consequent weather pattern changes will only serve to exacerbate some of them. Not addressing any one of these challenges has the potential to impact related issues. As such, we submit the overview of this year's recommendations below.

The scorecard in *this* report serves as a "report card", reflecting on the recommendations included in *last year's* report.

Recommendations Marked as "Completed"

Of the 31 recommendations in the scorecard from 2021, 4 were satisfactorily completed. Three completed items are particularly noteworthy victories for which all involved deserve commendation:

- *[1LU-2018.2]* **Advance Land Development Applications and Information.** PLUS now delivers a central platform to modernize the county's planning and land use infrastructure.
- *[3C-W-2021.2]* **Increase funding for the Stormwater Program.** This is a recurring request that meets a critical need of a growing county.
- *[4W-2021.4]* **Work with Covanta to Reduce Local Air Pollution Impacts.** Covanta has installed advanced technology NOx controls to obtain an additional 50% reduction.
- *[4WM-2021.2]* **Institute a Disposable Plastic Bag Tax.** This action reduces litter and the dangers of plastic pollution to streams.

Recommendations marked as "Making Progress"

Another 17 items are flagged as making satisfactory progress, and have been continued into the 2022 recommendations, mostly because they span several years. They bear watching to make sure they continue to successful completion. There are three most critical recommendations we particularly call to your attention:

- *[3B-W-2021.1]* **Set the fee rate collected for wastewater treatment to meet the documented needs of the necessary upgrades and maintenance requirements.** This is critical infrastructure that cannot be allowed to degrade.
- *[4WM-2021.1]* **Institute Recycling Data Collection and Reporting.** SWMP staff are commended for developing an approach to achieve the intent of the recommendation. However, concerns continue that the haulers have little or no "skin in the game" to increase recycling.
- *[5PER-2021.3]* **Seek More Stable Funding Sources for Fairfax County Park Authority (FCPA) Initiatives.** Continued funding support for CECAP and *future* financial support of Resilient Fairfax will also benefit the county's natural resources going forward.

Recommendations Marked as "Stalled"

We note with regret that 8 of the 2021 recommendations have either not been acted upon or are making unsatisfactory progress. All are continued in the 2022 recommendations. While the ultimate decision to act or decline to act falls to the Board, EQAC respectfully requests the Board to reconsider these items for actions.

Recommendations for 2022

There are 29 recommendations for 2022 including those continued from 2021. All are important, though we consider four especially critical:

- The three carried-over items mentioned above as "making progress," continue on this critical list.
- A new item, *Recommendation [6CE-2022.1],* **Incorporate Adequate Funding for both CECAP** implementation **and Resilient Fairfax in the Approved FY 24 Budget** also joins this critical list because reliance upon carryover funding could prohibit the funding of priority climate work because carryover may be inadequate to support needs.

Looking at the 2022 recommendations as a whole, we would like to identify two common themes that appear.

Funding Decisions

Many recommendations ask for increased funding to move forward and meet the County's future needs. For example, Climate recommendation #1 points out that CECAP, despite getting off to a great start, needs adequate long-term funding within the County's budget to monitor and direct our response to climate change. Other recommendations, such as those for parks and technology, request increased staffing to fill critical roles. Still others, such as wastewater, point out how maintenance activities are starting to fall behind our needs. All these activities are important. Some can briefly be deferred, but sooner or later must be addressed. EQAC urges the Board to look at these recommendations collectively and begin discussing how they can be funded as the county's commitment to a clean and healthy environment.

Planning and Monitoring

Growth and a changing climate both present serious challenges for Fairfax County. Several recommendations mention needs for more activity in planning and monitoring. For example, the comprehensive land-use plan is out of date, and a long-term perspective is needed. We also must monitor our waters for some important emerging contaminants. Rational planning for our waste disposal and recycling efforts is hampered by lack of comprehensive monitoring. While the initial actions of planning and monitoring may fall upon county staff, EQAC urges the Board to make sure actions are initiated and to respond favorably when the staff brings forward good proposals.

We thank the Board of Supervisors for their leadership on environmental issues and we look forward to supporting the Board and staff as they meet these challenges in the coming year.

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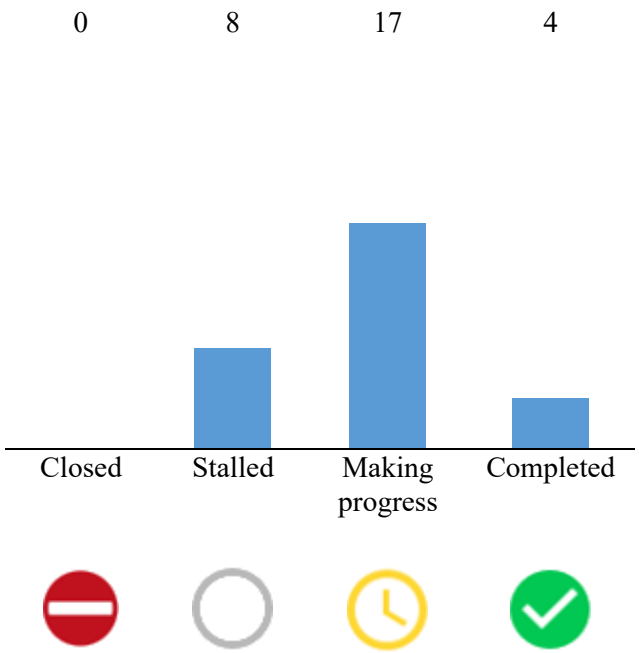
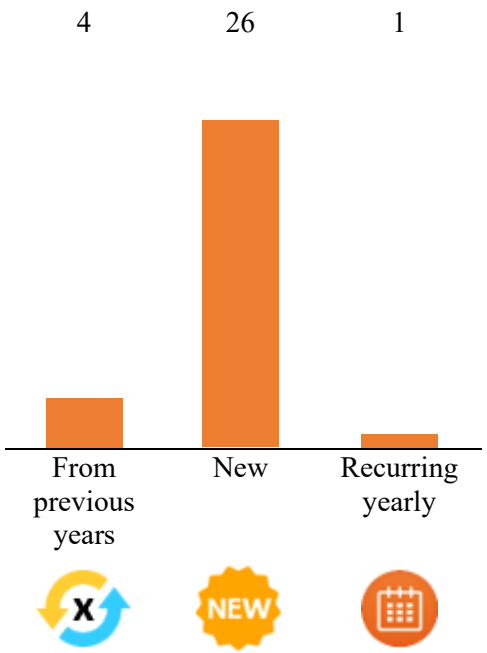
SCORECARD
Progress Report on 2021 Recommendations

Status of recommendations



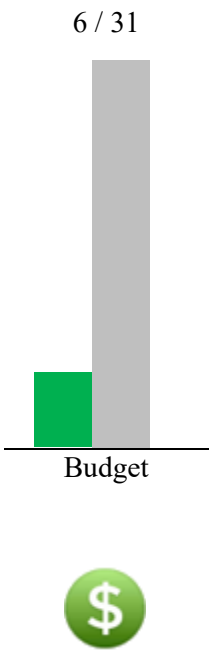
Closed: The recommendation will not be implemented.
Stalled: Little or no progress was made towards implementation
Making progress: Substantial progress was made towards implementing this recommendation
Successful: The recommendation was implemented

Age of recommendations



From previous years: Recommendation was included before 2021. The number in the icon in each row indicates the number of total years it has been included
New: New, long-term recommendation in 2021
Recurring yearly: Short-term, yearly recurring recommendation

Budget



Budget:
Ratio of issues which would most easily be addressed via a line-item in the budget.

I. LAND USE

	Land Use *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 1LU-2018.1* **Update the State of the Plan and Concept for Future Development Map** EQAC recommends that the Board authorize an update to the State of the Plan document. The last State of the Plan covered 2000 to 2010. EQAC also recommends that the Board authorize the development of a Concept for Future Transportation, Development, and Green Infrastructure. The 1992 Concept for Future Development map has largely been realized and a future map that looks out 20 to 50 years is needed.	This recommendation is being addressed. Work on the State of the Plan document is ongoing and is planned to be published in 2022. The county is moving towards greater use of interactive mapping applications, rather than static maps, including the JADE mapping tool that allows users to display multiple layers of data and dynamically turn on and off information and data.	Making Progress / Recommended since 2018  This recommendation was delayed during COVID. Recent discussions have confirmed the State of The Plan is on track for 2022 completion. The Concept for Future Transportation, Development, and Green Infrastructure should follow to provide a long-term vision for large investment projects and holistic rejuvenation of the County environmental infrastructure.
2	*Recommendation: 1LU-2018.2* **Advance Land Development Applications and Information** EQAC encourages enhancing the Planning Land Use System (PLUS) to include analytical reporting tools for land use planning.	This recommendation is being addressed. PLUS has completed three of four releases to deliver a central platform to modernize the county's planning and land use infrastructure. The new central platform will be fully functional in fall 2022. Release Four incorporates more than 125 remaining plans, permits and transactions for commercial and residential construction, site-related plans, water supply permits, and others.	Completed / Recommended since 2018  PLUS is a significant advancement that unifies many processes. EQAC encourages continued investment to merge additional GIS capabilities but is closing this as a success.

	Land Use *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
3	*Recommendation: 1LU-2019.3* **Improve Processes to Minimize Ecological Degradation from Development Pressure** 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 is discussed through Comprehensive Plan policies, which address the identification, preservation, protection, and enhancement of plant and animal life and the creation of an integrated network of ecologically valuable land and surface waters. The county seeks to balance the protection and enhancement of these resources while planning for the orderly development and redevelopment of the county. These efforts have focused primarily on Environmental Quality Corridors (EQCs), Resource Protection Areas (RPAs), floodplains, and steep slopes and tree preservation and tree cover. These areas contain valuable ecological resources and help create an ecological network. Resources within these areas are considered on a site-by-site basis as land use applications are reviewed by staff and evaluated by the Planning Commission and Board of Supervisors.	Stalled / Recommended since 2019  With the intense development pressure on natural space, this recommendation has not received appropriate attention. There are too many examples of inappropriate development, low environmental priority on land use decisions, and missed preservation opportunities of scarce natural lands. Examples: Justice Park, Auctioned Land along Accotink Creek near RPA and adjacent to the Cross County Trail, Road expansion along Route 7 in Great Falls.
4	*Recommendation: 1LU-2021.1* **Private Sector Green Building Standards** 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.	This recommendation is in the process of being addressed. Actions are currently underway to review existing policies and identify areas for CECAP implementation. As part of a future Plan or Zoning Ordinance Amendment, research and study will be required to determine anticipated growth, estimated energy consumption, and what measures should be recommended to attain net-zero energy. All actions necessary to address EQAC's recommendation would be conducted during a future Plan or Zoning Ordinance	Making progress / New in 2021  EQAC continues to encourage rapid adoption of policies to achieve the CECAP goals. The County has adopted exemplary public sector green building standards. Private sector standards need to follow.

	Land Use *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
		Amendment.	

II. TRANSPORTATION

	Transportation *Two Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 2TRANS-2021.1* **Develop a formal plan to increase light-duty electric vehicle (EV) registrations to at least 15% of total registrations by 2030.** 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 accepted 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.	OEEC is developing short- and long-term CECAP implementation plans that it anticipates presenting to the BOS in 2022 and beyond. OEEC notes that the plans will include education, outreach, and public engagement initiatives regarding EVs that will begin in 2022 and continue thereafter. OEEC plans to address existing and potential incentive programs including mechanisms for providing financial support or encouragement to those interested in purchasing and registering an EV in the county.	Making progress / New in 2021  EQAC appreciates that county staff are taking these several actions and would like to see a formal plan be presented to the BOS by the end of 2022 that clearly identifies the approach to be used to meet the 2030 goal and that specifies interim goals for 2024 and 2027 to ensure that progress can be measured. In addition, EQAC would like to see the BOS adopt this plan and a complementary plan to significantly enhance the EV charging infrastructure across the county, as described in the Climate and Energy chapter.
2	*Recommendation: 2TRANS-2021.2* **Develop a formal plan to increase transit and non-motorized**	OEEC is developing short- and long-term CECAP implementation plans that it anticipates presenting to the BOS in 2022 and beyond.	Making progress / New in 2021

	Transportation *Two Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	commuting (including teleworking) to at least 30% by 2030, including setting interim target goals to be achieved by 2024 and 2027. EQAC supports the CECAP goal of increasing transit and non-motorized commuting to 30 percent (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 were included in last year's report.	FCDOT identified several specific actions it has undertaken related to this recommendation including implementation of the Transit Development Plan; development of the Centreville/Chantilly/Vienna/Tysons Route Optimization Study (relates to bus service); implementation of the Reston-Herndon Bus Plan in support of WMATA's Silver Line Phase 2 expansion; development of the Transit Strategic Plan which will update the existing Transit Development Plan; implementation of a micro-transit service pilot in Tysons, Great Falls, and McLean; expansion of Capital Bike Share; construction of the I-66 cross county trail as part of the Express Lanes project; design of the Richmond Highway Bus Rapid Transit (including a parallel multi-use trail); funding for Phase II of the ActiveFairfax Transportation Plan; and increased bicycle and pedestrian data collection. Some of these projects will require grant funding which is in the process of being sought.	 EQAC appreciates that county staff are taking these several actions and would like to see a formal plan be presented to the BOS by the end of 2022 that clearly identifies the approach to be used to meet the 2030 goal and that specifies interim goals for 2024 and 2027 to ensure that progress can be measured. In addition, EQAC would like to see the BOS adopt this plan and provide the funding and resources needed for it to be implemented. For example, that the BOS provide the staff positions needed to implement the Safe Streets for All Program which the BOS unanimously endorsed on May 10, 2022. EQAC recognizes that there is uncertainty about predicting future commuting behaviors however notes that development of a formal plan to reach a 30% goal as identified by the CECAP would include identifying appropriate assumptions that could be evaluated over the course of its implementation.

III. WATER

	Water *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 3A-W-2021.1* **Continue and enhance the protection of the Occoquan Reservoir, as needed.** Studies and actions listed in the 2021 EQAC report 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.	Among other comments, staff highlighted the preservation of water quality in the reservoir is of significant value to public health and welfare. A land use approach to maintaining water quality could be continued and broadened throughout the basin, to include the maintenance of very low density and cluster development; and the continued identification, protection, and enhancement of environmentally-sensitive areas, including wetlands and Environmental Quality Corridors. The regulation of point source pollution under the Occoquan Policy, the regulation of non-point source pollution in the watershed, and down zoning within the Occoquan Basin have protected water quality in the Occoquan Reservoir for more than 50 years. These and other actions are needed to continue to protect the reservoir, enhance its ecological integrity, preserve its recreational value, and support the economic vitality of the region.	Making progress / New in 2021  EQAC concurs with the staff response that "A land use approach to maintaining water quality should be continued and broadened throughout the basin, to include the maintenance of very low density and cluster development; and the continued identification, protection, and enhancement of environmentally-sensitive areas, including wetlands and Environmental Quality Corridors."
2	*Recommendation: 3A-W-2021.2* **Fund monitoring of emerging contaminants and the rising sodium levels in the Occoquan Reservoir.**	Staff commented that the recommendation is being addressed. Monitoring of the Occoquan Reservoir system by the Virginia Tech Occoquan Monitoring Laboratory (OWML) is funded by Fairfax County through two separate mechanisms: the Occoquan Watershed	Making progress / New in 2021  There are new programs in place awaiting implementation.

	Water *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	Emerging Contaminants: The Occoquan Watershed Monitoring Lab budget has remained flat-funded for almost 10 years. 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. Additional concerns include Synthetic Organic Compounds (SOCs), salt, and chloride.	Monitoring Program and the Synthetic Organic Compound (SOC) monitoring contract. This monitoring has shown over several decades that the watershed SOC levels are generally very low and not of major concern. OWML and county staff are currently exploring the possibility of shifting monitoring of contaminants of emerging concern from SOCs to evaluate other potential contaminants of emerging concern in the Occoquan watershed. Rising sodium levels in the reservoir have generated significant attention over the last five years. Virginia Tech OWML is leading a trans-disciplinary project seeking to catalyze innovative solutions to inland freshwater salinization, in partnership with stakeholders.	
3	*Recommendation: 3B-W-2021.1* **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.**	DPWES agrees with this recommendation, although the Board of Supervisors has not consistently approved wastewater rates over time due to economic conditions, especially during the COVID-19 pandemic. DPWES concurs with this recommendation. The county is proposing an increase in wastewater service charges as part of the FY 2023 budget proposal to the Board of Supervisors.	Making progress / New in 2021  There was no rate increase in FY21 and an insufficient increase in FY22 in the rate required to keep the maintenance and replacement on schedule which leaves the program underfunded. EQAC appreciates the FY23 funding and looks forward to future progress on this

	Water *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
			recommendation.
4	*Recommendation: 3B-W-2021.2* **Continue aggressive public education and monitoring of the new alternate septic systems performance as necessary.** Developers are increasingly using alternative onsite sewage disposal technology which is becoming the norm to maximize lot yield from properties. But these systems require more aggressive maintenance and homeowners may not be aware of their responsibilities for maintaining these systems.	The Health Department has addressed this recommendation in several ways and will continue to work with county partners to provide outreach and education to owners of alternative systems. There are also plans to implement an online reporting system to facilitate easier submission of inspection reports by maintenance provider.	Making progress / New in 2021  EQAC has not yet had the opportunity to meet with the Health Department to assess the success of this outreach, but we look forward to doing so.
5	*Recommendation: 3C-W-2021.1* **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. EQAC urges that where possible these policies and	This recommendation supports county policies and ordinances that are routinely applied/implemented through the development review and site / subdivision review processes and also highlights the need to retain or enhance policies and requirements that serve to protect environmentally sensitive lands. Some new initiatives related to this recommendation include FEMA's recently completed multi-year project to reexamine Fairfax County's flood zones and publish new maps, changes to the state's Chesapeake Bay	Making progress / New in 2021  EQAC appreciates the planning currently being done and we look forward to the implementation of the initiatives currently in progress and their ultimate effectiveness.

	Water *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	ordinance should be enhanced.	Preservation Area Designation and Management Regulations, 9VAC25-830, the county's Flood Risk Reduction Program, and OEEC's development of a comprehensive Climate Adaptation and Resilience Plan (Resilient Fairfax).	
6	*Recommendation: 3C-W-2021.2* **Increase funding for the Stormwater Program.** EQAC recommends that the funding 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.	The FY23 Budget includes no increase to the stormwater tax rate of $0.325 per $100 of assessed real estate value; however, based on the increase in real estate assessment throughout the County, the Stormwater fund is anticipated to receive up to an additional $7.2 million in FY23.	Completed / Recurring yearly  This financial need for the year was met through a different mechanism than an increase in the stormwater assessment.

IV. WASTE MANAGEMENT

	Waste Management *Five Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 4WM-2021.1* **Institute Recycling Data Collection and Reporting** The County is encouraged to continue improving outreach, but to also to require private haulers to	SWMP staff proposed an alternate approach to accomplishing this recommendation. A "Four Touch Points" will require licensed collectors to deliver at least four specific pieces of waste reduction or recycling outreach and/or education to their customers every year.	Making progress / New in 2021  SWMP staff are commended for developing an approach to achieve the intent of the recommendation.

	Waste Management *Five Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	report to their customers their annual percent of curbside collection that is recycled. Institute reporting policies on private waste haulers that result in increased recycling.		However, concerns continue that the haulers have little or no "skin in the game" in increase recycling.
2	*Recommendation: 4WM-2021.2* **Institute Litter Control** • Allow the Litter Control Task Force to complete their work • Support Virginia law changes for a container redemption fee ("bottle bill") • Enforce litter control requirements on Waste Haulers	The litter task force completed their report. The disposable bag litter abatement program was adopted by the County. The bottle bill is stalled. SWMP staff reject further enforcement on the haulers.	Making progress / New in 2021  There are successes with the litter task force and the bag bill implementation. Concerns continue about enforcement to correct litter around collection sites. Dumpster complaints have been increasing at an alarming rate. The SMWP proposes investigating why this is happening. The recommendation for enforcement remains.
3	*Recommendation: 4WM-2021.3* **Establish Environmental Purchasing Numeric Targets** 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.	The staff responded by discussing their budget. No response to the recommendation. Based on this no targets have been developed.	Stalled / New in 2021  EQAC operates on data and specific goals. Without these, success or failure of the program cannot be assessed by EQAC.

	Waste Management *Five Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
4	*Recommendation: 4WM-2021.4* **Work with Covanta to Reduce Local Air Pollution Impacts**	Covanta has installed advanced technology NOx controls to obtain an additional 50% reduction.	Completed / New in 2021 
5	*Recommendation: 4WM-2021.5* **Consider Environmental and Safety Benefits of Sanitary Districts Petitions** There are environmental and safety benefits of having a single hauler for a neighborhood.	Staff supports this recommendation. This is a recommendation directly to the Board of Supervisors.	Making progress / New in 2021  The Board is exploring approaches to provide for contracted sanitary collection districts that would reduce environmental and safety concerns.

V. PARKS AND ECOLOGICAL RESOURCES

	Parks & Ecological Resources *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 5PER-2019.1* **Increase Capacity for Environmental Review of Development Plans** 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	Staff's response indicated that this recommendation has been addressed. The MOU between LDS and UFMD allows for a recalibration of level of effort each year between the departments. The increased number of infill application reviews over the past three years has been demanding on staff resources, but on average UFMD has been able to meet deadlines of review periods while maintaining and providing high quality review.	Completed / Recommended since 2019  While UFMD indicates that last year's concern has been addressed, staffing shortages and/or an increase in number of plans could occur in the future and thus again be a concern. EQAC thanks LDS and DPWES for meeting annually to help address any issues which may occur.

	Parks & Ecological Resources *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	applications combined with the ongoing challenge of sufficient review capacity has at times resulted in a lower quality review of the incoming applications than for which UFMD strives.	Though year-over-year plan review has continued to grow, UFMD has also had issues with employee attrition due to retirements and voluntary resignations. At one point in calendar year 2021, the Forest Conservation Branch, responsible for plan review, had a 31 percent vacancy rate. While the quality of review of incoming applications may have been affected on occasion by these challenges, UFMD provided high quality review of applications on a consistent basis. In addition, efficiencies have been gained by the new electronic plan review systems and the forthcoming PLUS system. LDS and DPWES will continue to meet annually to review overall level of efforts of UFMD plan review.	
2	*Recommendation: 5PER-2021.2* **Improve the Land Development Process by Prioritizing Trees** 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	Staff's responses addressed each of the six recommendations individually made by the Tree Commission, as referenced by EQAC in the 2021 Annual Report. This scorecard does not provide the details of the answers, but rather this summary: Staff concurred with the *intent* of the following: 1. Approving a natural resources and tree inventory with a conceptual site plan prior to submittal of the site plan. However, staff felt as though the current process sufficiently addresses the intent.	Making progress / New in 2021  Tree canopy has gotten more attention in the past year given the County's focus on climate initiatives, particularly CECAP and Resilient Fairfax, and also on addressing flooding concerns. A subset of these recommendations is again included in EQAC's 2022 report due to the

	Parks & Ecological Resources *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	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.	Staff concurred with: 1. Raise the fee in lieu. 2. Analyze effectiveness of the 10-year tree canopy requirement. 3. Identify high priority tree planting areas using an equity lens and vulnerability index. Staff did not concur with: 1. Increasing property boundary setbacks for infill development and rezonings to provide more space for mature trees. 2. Providing developers the option to build higher to allow space for natural resources.	critical importance trees play in terms of things such as mitigating heat island effects, absorbing stormwater, providing shade (e.g., for homes, sidewalks), and providing critical habitat. The process by which the County develops land is a crucial in helping protect and grow our natural resources, particularly with an eye towards equity.
3	*Recommendation: 5PER-2021.3* **Seek More Stable Funding Sources for Fairfax County Park Authority (FCPA) Initiatives** 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. The 2021 recommendation included several	Staff's response recognizes progress made on this front, with a budget proposal for long-term FCPA ecological maintenance as well as an expansion of Fund 40080, Integrated Pest Management Program proposed by FCPA and DPWES-UFMD, respectively. FCPA continues to apply for and receive funding for the Invasive Management Area (IMA) program through Fairfax County's Environmental Improvement Program (EIP). An increase of $50,000 for total funding to $350,000 is included in the FY 2023 Budget. Ecological maintenance activities have also been undertaken on parkland and public land by Operation Stream Shield, an employment program for county residents experiencing homelessness.	Making progress / New in 2021  EQAC commends the Board of Supervisors for the $751,000 budget approval in FY23 which has helped to fund FCPA's new Landscape Legacy and Sustainability Program. EQAC also compliments the Board for their continued and increased funding support of the EIP, which was funded at $1,298,767 in the FY 2023 Adopted Budget. This funding will go towards ecologically important programs such as the

	Parks & Ecological Resources *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	ideas for funding to address long-term natural resource management needs across FCPA's approximately 17,000 acres of natural area.	Operation Stream Shield has proven extremely beneficial and additional funding for this effort would directly benefit FCPA as well as the nonprofits and employees associated with the program. The Board should continue to work with staff to seek additional means of stable, long-term funding for FCPA's natural resources maintenance activities to include program budget proposals, grant opportunities, proffers, and other funding avenues for natural resources maintenance.	Invasive Management Area program (which saw a $50,000 increase in budget), creation of new urban green spaces, and Watershed Protection and Energy Conservation Matching Grant Program. Continued funding support for CECAP and *future* financial support of Resilient Fairfax will also benefit the county's natural resources going forward.
4	*Recommendation: 5PER-2021.4* **Strengthen Authority to Address Management of Invasive Species Throughout the County** 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	This recommendation is in the process of being addressed. Invasive plants remain a major concern for land managers in Fairfax County. FCPA staff represented FCPA and Fairfax County at the Virginia Invasive Plant Workgroup, a state-led effort to assemble stakeholders in invasive plant management to discuss strategies for mitigation and control. The Workgroup provided recommendations to the state legislature for invasive plant management. Additionally, FCPA, DPWES-Stormwater Planning Division (SWPD), and NVSWCD have proposed a joint effort to the Fairfax County EIP to manage the growing problem of invasive water chestnut.	Making progress / New in 2021  EQAC commends both the Board's FY23 budget investments in this area (e.g., increase of $50,000 for the IMA program, funding for Operation Stream Shield which helps fight invasives, funding to provide support and guidance for private landowners on water chestnut management) and the Board's passing of the new Running Bamboo ordinance which goes into effect on January 1, 2023.

	Parks & Ecological Resources *Four Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	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 were included in the 2021 recommendations.	An increase of $50,000 for a total of $350,000 has been included in the FY 2023 Budget for the Invasive Management Area (IMA) program.	There is much more to be done as invasive plants continue to remain a major concern for land managers in Fairfax County, as staff indicated. This problem ignores public/private boundaries and will require everyone working towards this common goal of managing invasive species.

VI. CLIMATE AND ENERGY

	Climate & Energy *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 6CE-2021.1* **Adopt climate and energy related recommendations from other chapters** Nine key recommendations from other chapters, noted in the 2021 report, all share the goal of addressing key climate and energy issues identified by EQAC.	OEEC does not concur with this recommendation. OEEC also considers this recommendation ambiguous. For example, it is unclear in what context, when, or by whom adoption would occur. A recommendation to adopt nine listed recommendations from different chapters of the Annual Report on the Environment is incompatible with the established process for responding to EQAC's recommendations. This long-standing process contemplates that each EQAC recommendation is addressed individually by a lead agency and typically one or more coordinating agencies. Blanket adoption incorrectly assumes that it is appropriate and	Stalled / New in 2021  EQAC makes recommendations to the Board of Supervisors. EQAC appreciates that OEEC may not be responsible for implementing these or other recommendations but EQAC's intent was to highlight the relevance of these recommendations to the Board of Supervisors.

	Climate & Energy *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
		reasonable to accept EQAC's recommendations – in this case, nine recommendations in the areas of transportation, stormwater, parks and ecological resources, and land use – without considering the expert analysis and input provided by staff, including concerns that they may raise.	
2	*Recommendation: 6CE-2021.2* **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** 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.	While OEEC is tracking energy use and GHG emissions associated with all aspects of county operations in accordance with the goals and targets of the Operational Energy Strategy (OES) and is building capacity to track annual aggregate energy use from the community, OEEC does not concur with that portion of the recommendation that pertains to the Virginia Clean Economy Act (VCEA), because the VCEA is a state, not county, matter. The development of VCEA plans and milestones and the assessment of progress on VCEA implementation are activities that are being done at the state level.	Stalled / New in 2021  It is great that the County has a good way to track County energy use and GHG emissions. Because the other GHG emissions from the County comprise the vast majority of the County's overall emissions, it is critical to also count these and progress in counting these emissions is a positive step forward. Because progress with the VCEA could result in reducing about 50 percent of the County's emissions, with the VCEA's progress related to Fairfax County is important but there was no intent to request that staff track all VCEA activities and progress. Staff appear ready to undertake a robust outreach process once

	Climate & Energy *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
			decisions are made on CECAP implementation. To be effective, meaningful engagement of stakeholders will be needed. Further progress on this issue will be tracked via this new recommendation in 2022: 6CE2022.2.
3	*Recommendation: 6CE-2021.3* **Undertake a major outreach and educational campaign on the actions that businesses and residents can do to reduce GHG emissions**	The Office of Environmental and Energy Coordination (OEEC) concurs with this EQAC recommendation and is already taking steps to address it.	Making progress / New in 2021  County staff appear ready to undertake a robust outreach process once decisions are made on CECAP implementation. To be effective, meaningful engagement of stakeholders will be needed. This recommendation has been moved to a comment in this year's report.
4	*Recommendation: 6CE-2021.4* **Appoint a group of business leaders to advise the board on climate and energy issues** 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	This recommendation is directed to the Fairfax County Board of Supervisors (Board). Consequently, it has not already been addressed by the Office of Environmental and Energy Coordination (OEEC), nor is the OEEC in the process of addressing it. OEEC, however, is in the process of revitalizing its Green Business Partners program, and this revitalized program	Stalled / New in 2021  The wording of this recommendation was modified in 2022 to remove the word appoint, which caused concern by a County Manager.

	Climate & Energy *Six Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	is important to promote climate and energy interests with the business community in Fairfax County.	could provide outcomes similar to those EQAC seeks with this recommendation.	
5	*Recommendation: 6CE-2021.5* **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** 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 their journey.	The Office of Environmental and Energy Coordination (OEEC) has not addressed this recommendation, nor is it in the process of doing so. According to a White House fact sheet, as a result of federal infrastructure investments, Virginia is likely to receive approximately $106 million over five years to support the expansion of its charging network and will have the opportunity to apply for an estimated $2.5 billion in grant funding. Fairfax County anticipates participating in the expansive state effort, possibly in conjunction with the Virginia Association of Counties (VACo) and/or the Northern Virginia Regional Commission (NVRC).	Stalled / New in 2021  The influx of funding to provide for federal infratsructure investments provides an window of opportunity to systematically provide for an EV charging network that supports travelers throughout Virginia. In the absence of such planning, important transportation corridors may be underserved while other areas end up with unneeded charging capacity.
6	*Recommendation: 6CE-2021.6* **Take actions in the CECAP report that the county can take immediately** 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.	The most immediate action that the county, through the Office of Environmental and Energy Coordination (OEEC), can take to implement the CECAP actions and sub-actions is to prioritize them, so that those with the most significant impact in terms of reducing greenhouse gas (GHG) emissions can be designated as the highest priority.	Making progress / New in 2021  An OEEC manager and presentations to the Board have highlighted actions that have started. However, it appears unlikely that the County has taken action for all those actions that could be implemented immediately.

VII. AIR QUALITY

	Air Quality *One Recommendation in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 7AQ-2021.1* **Continue to strongly encourage people to telework where possible, take public transit, and use alternative forms of 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.	Making progress / New in 2021  County staff is working to expand and enhance bus service in the county. Fairfax County is also updating and combining the Bicycle Master Plan and the Countywide Trails Plan into the ActiveFairfax Transportation Plan.

VIII. WILDLIFE MANAGEMENT

	Wildlife Management *One Recommendation in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 8WIL-2021.1* **Hiring of Part-Time Wildlife Assistant** 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	Staff notes an ongoing need for sustained staffing and funding for the Fairfax County Wildlife Management Specialist Office. FCPD has been able to increase staff capacity in recent years and successfully absorb costs for staffing and operations for the wildlife program.	Stalled / New in 2021  EQAC commends the County for its effort to support staffing needs of the Wildlife Management Specialist office within FY2020. EQAC recognizes the challenges of dealing with the unprecedented health crisis

	Wildlife Management *One Recommendation in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
	wildlife assistant. 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.		of COVID-19 and appreciates prioritizing the allocation of funding in FY2021 to address the needs of the County during that time. However, with the business needs of Fairfax County returning closer to baseline conditions, EQAC emphasizes the need to provide greater staffing support to this program to meet the needs of the public around wildlife management issues highlighted with in the chapter.

IX. TECHNOLOGY

	Technology *Two Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
1	*Recommendation: 9TECH-2021.1* **Fund LiDAR Capture** The county should fund recapture of LiDAR data in 2022 to provide ongoing data for metrics on tree cover and stream erosion.	The county has applied for a federal grant through the Department of Interior's (DOI) 3D Elevation Program. If approved this joint funding agreement will cover two-thirds of the cost of the flight. The planned flight date is between Dec 2022-Jan 2023 for leaf off conditions. The product would be United States Geological Survey (USGS) QL1, the same	Making progress / New in 2021  The general fund portion of this recommendation has been funded. Funding of $183,000 has been included as part of the FY 2022 Third

	Technology *Two Recommendations in 2021*	**Summary of Action Taken by Agency or Department**	**Status / EQAC Comments**
		resolution of 8 ppm as flown last time with tidal corrections and extents out to all contributing watersheds. This capture will also seek to produce a countywide building layer that would help fill the five-year gap from the last planimetric building update, providing new information for impervious surface analysis. The flight will produce a new two-foot contour of the entire flight extent as well.	Quarter Review in project IT00028 in Fund 10040, Information Technology Projects.
2	*Recommendation: 9TECH-2021.2* **Support GIS staffing** The county should prepare a plan for fully staffing GIS support positions in FY 2022, with particular attention to Spatial Analyst IV position.	DIT has not been able to address this recommendation in FY 2022 as the agency continues to be impacted by COVID-19 staffing issues, vacancies, and retirements across all divisions. Currently DIT has needs in many areas and is working with DMB to address this. This recommendation is being addressed in part by opening the possibility of agencies having Spatial Analyst IV positions in circumstances where these positions manage a broader agency GIS program serving the particular business needs of the agency and supervising staff.	Stalled / New in 2021   Additional staffing has been delayed due to COVID-19 considerations. While delay is understandable, adequate staffing to support GIS activities remains important if the county is to realize the maximum return of its investment in GIS. These recommendations would have significant budget implications with reclasses and funding for positions. That funding is currently not available.

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 1.170 million residents and 418,000 households[2]. 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 in which we live. 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 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

[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 2021, County of Fairfax, Virginia

codified resource protection areas (RPAs) and defined them using perennial streams as the ecological basis for protecting land from development.

With build-out, 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 holistic lens that equally values business, social, cultural, and environmental priorities.

CURRENT STATUS

The most pressing land use challenges in 2022 are global climate change and dealing with multiple pressing priorities on land including equity and resilience. The county signed the Carbon Neutral Counties Declaration to become carbon neutral in its energy use for government operations by 2040[3] and accepted the Community-wide Energy and Climate Action Plan (CECAP) to reduce greenhouse gas emissions by half by 2030 and achieve carbon-neutrality by 2050[4]. The county is also focusing on equity through One Fairfax and recommendations from the Chairman's Taskforce on Equity & Opportunity: Strategic Plan & Economic Recovery[5]. Neither of these topics were central to prior generational considerations, yet both are critical to today's holistic considerations for using land. Furthermore, the tools used to make land use decisions, namely the Comprehensive Plan, especially the Policy Plans do not fully incorporate these new concerns.

EQAC is also following One Fairfax and supports recommendations from the Strategic Plan & Economic Recovery Framework Alignment Matrix[6]. In particular

> Recommendation 16: Develop, pilot, and institute Fairfax County equity-based decision-making tools for planning, projects, decision making and resource allocation.
> Which aligns to strategic element EEG 12: Implement a workplace culture change effort to actively promote equity and inclusion, collaboration, excellence, innovation, customer service, transparency, accountability, and trustworthiness.

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. This

[3] https://www.fairfaxcounty.gov/news/fairfax-county-commits-carbon-neutral-energy-use-2040
[4] https://www.fairfaxcounty.gov/environment-energy-coordination/climate-planning-action
[5] https://www.fairfaxcounty.gov/boardofsupervisors/sites/boardofsupervisors/files/assets/meeting-materials/2021/sept21-budget-chairman-task-force-recommendations-and-actions.pdf
[6]https://www.fairfaxcounty.gov/topics/sites/topics/files/assets/documents/pdf/july%2029.%2021%20memo%20to%20bos.pdf

report is currently underway and will be the first step in reviewing how the Comprehensive Plan and Policy plans have been meeting their intended goals.

The holistic approach that evolved as the county approached build-out must now consider additional dimensions for conserving energy and align with an equitable and sustainable future. One of the first Comprehensive Plan updates to face this additional complexity is the DRAFT Reston Comprehensive Plan update[7] that is underway and should be completed in 2022. The Reston task force had to consider new business and lifestyle models necessitated by Covid 19 along with climate change and rapid technological changes. Proposed sections highlight environmental stewardship, equity, affordable housing, health, heritage, and art. EQAC is concerned that the Comprehensive Plan, specifically the Policy Plan Chapters, need a comprehensive review that baselines priorities along with a rubric that appropriately expresses Fairfax land use values.

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 is minimum compliance. EQAC is updating our prior recommendation to include ecological impacts as a consideration along with net-environmental benefits.

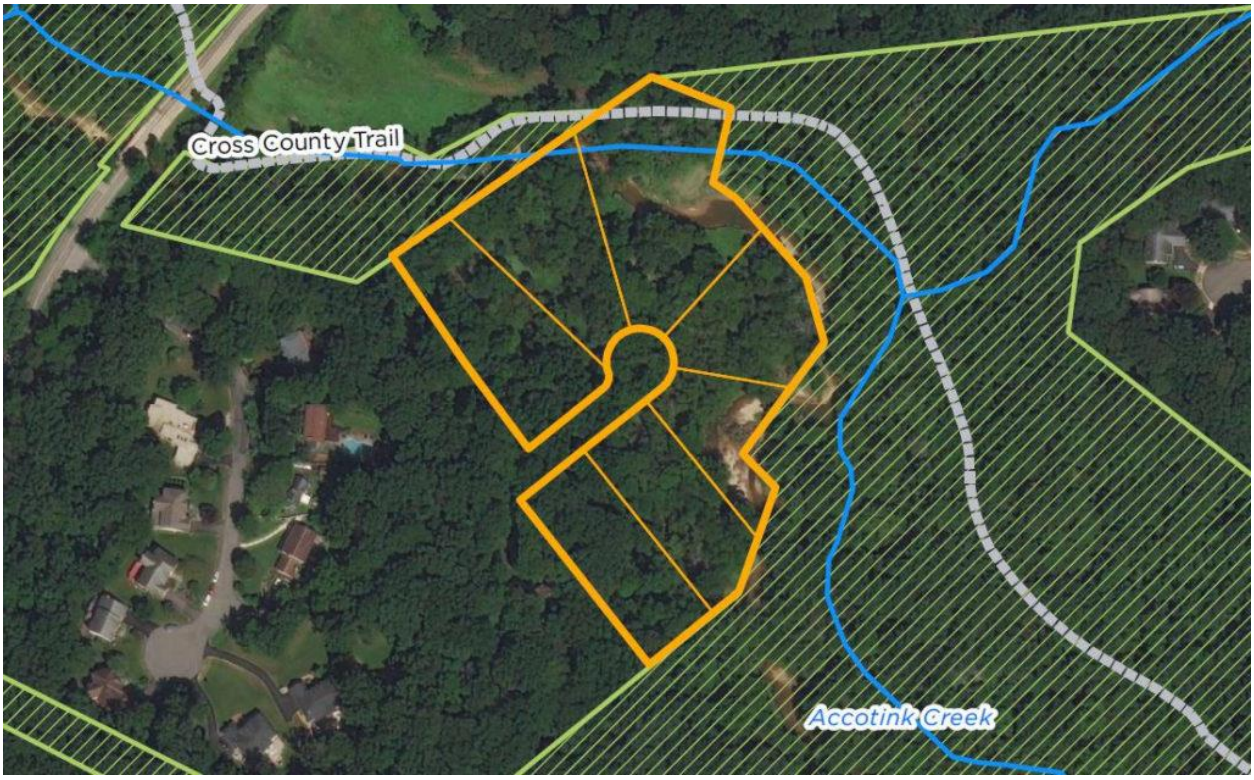
These development pressures apply to all open space, not just fragile ecological lands. In 2021, a complicated case arose at Justice High School in Mason District. Justice High School is in desperate need of an expansion, and the county approved bond funding for the project. The proposal builds a new structure on an existing school parking lot. However, the school needs to replace the lost parking spaces. The neighboring Justice Park was proposed to transfer several acres from the Fairfax County Park Authority(FCPA) to Fairfax County Public Schools (FCPS) replacing a public field with a parking lot. This proposal was made with token public outreach and after many meetings replaced with a parking waiver to be reviewed in 5 years. The plan ignored the value of urban open space serving the community in the zip code of highest socio-

[7] https://www.reston.org/reston-comprehensive-plan

economic need[8]. It also highlighted the lack of investment in community parks that are frequently overridden by invasive plants and do not function effectively. Such environmental and equity issues will become more common as open space becomes scarcer and land values continue to increase.

Another example of development pressures and the inability to manage lands inappropriate for development occurred in the Accotink stream valley. Seven undeveloped properties that border the RPA and Cross County Trail were assumed by the county for back taxes. These properties are clearly unsuitable for development but could not be protected and had to be auctioned to the highest bidder. The Northern Virginia Conservation Trust tried to acquire them for transfer to the FCPA but bidding by developers was too high.

Figure I-1: Accotink Creek Properties Auctioned in 2022



From the perspective of a net-environmental benefit, these good, forested lands have the highest potential environmental benefit. The county needs the tools and resources to make decisions that protect these fragile lands as well as those that provide equitable benefit to all county residents and meet the future commitments made to address global climate change.

[8] 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

In 2020, the county updated the Green Building Policy setting a path for county building to be net-zero energy by 2031 and an aggressive plan to reach that goal.[9] 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.

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 both construction practices and for 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: 1LU-2018.1 | Age: 4 years | Status: Making progress

   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. While this recommendation was delayed during COVID, EQAC appreciates that recent discussions have confirmed the State of The Plan is on track for 2022 completion.

   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 Areas[10] and is used within the Countywide Transit Network Study to design the proposed High Quality Transit Network. These reflect the reality that the 1990 Future has largely been realized and that a new future map that looks out 20 to 50 years is needed.

2. **Improve Processes to Minimize Ecological Degradation from Development Pressure**
   Recommendation: 1LU-2019.3 | Age: 3 years | Status: Stalled

   Justification and Background:

[9] https://www.fairfaxcounty.gov/environment-energy-coordination/green-building
[10] https://www.fairfaxcounty.gov/planning-development/comprehensive-plan/special-planning-areas

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. EQAC also recommends that the ecological function of existing land be a consideration when new development is proposed on open space. This establishes the value of land that can be applied consistently across all projects and fits into the multi-dimensional rubric that needs to be considered for future planning,

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.

3. Private Sector Green Building Standards
Recommendation: 1LU-2021.1 | Age: 2 years | Status: Making progress

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 development 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. Advance Land Development Applications and Information
EQAC commends the county for completing phase 4 of the PLUS system to create a single system of record for land development. This provides a centralized platform for analyzing the Comprehensive Plan potential both during review and when amendments are approved.

4. 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.

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."[11]

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.[12] 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.[13] In the 2021 Annual Report on the Environment (ARE), EQAC focused its transportation chapter on these Transportation Sector goals in coordination with recommendations in other ARE chapters, including those in Climate and Energy; and Air Quality. Specifically, two recommendations were made in the 2021 ARE:

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)
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)

[11] 2017 Fairfax County Environmental Vision, Section 2 B, pg. 11, www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf
[12] https://www.fairfaxcounty.gov/environment-energy-coordination/cecap
[13] https://www.fairfaxcounty.gov/environment-energy-coordination/public-engagement-cecap

Fairfax County staff response to these recommendations was positive and indicated that initial steps for both of these recommendations are currently being implemented, though in the case of Recommendation 2TRANS-2021.2, specific individual activities were being undertaken rather than development of a formal plan. As a result of this activity, EQAC is reiterating these same recommendations related to transportation for 2022. In addition, for Recommendation 2TRANS-2021.2, EQAC is expanding its recommendation to further support the Safe Streets for All Program.

EQAC also notes that the Resilient Fairfax plan was nearly completed at the time of writing this ARE. EQAC is generally supportive of the concepts it was briefed on about Resilient Fairfax and anticipates providing more specific input related to that plan in a future ARE.

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 infrastructure includes sidewalks, trails, and micro-mobility modes (e.g., mopeds and scooters). According to data from the 2020 Census, about 39% of workers commuted to work by a means other than Single Occupancy Vehicle (SOV). More specifically, approximately 23% of workers did not commute as they worked from home, while 7% commuted by carpool and 1.5% walked to work. Notably, only 4.5% of workers commuted via transit.[14] There is no doubt that the COVID-19 pandemic has significantly impacted commuting patterns. In addition, it is likely that the situation in 2022 as this report is being written is very different from that which is reflected in the 2020 Census data, since the Census data was collected at the height of the pandemic when many offices and other business were closed. Since that time, there has been somewhat of a return to pre-pandemic norms, though transit ridership remains depressed and work-from-home numbers remain elevated. EQAC is assuming that county planners are working to evaluate likely future trends and considering various potential commuting patterns in their transportation planning decisions.

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 Two. The final products of Phase One were a Vision, Goals and Objectives statement; a Safe Streets for All Program Recommendations; and an engagement report. The Safe Streets for All Program, a comprehensive initiative to address systemic transportation safety issues for people walking, biking and using other forms of active transportation was unanimously endorsed by the BOS on May 10, 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

[14] Fairfax County Government Demographics; https://www.fairfaxcounty.gov/demographics/commuting-patterns

prioritization strategies, is anticipated to be completed by 2024 such that it could be presented to the BOS for their consideration (representing a delay from the schedule identified in last year's ARE of completion by the end of 2022). County staff note that completion of the ActiveFairfax Transportation Plan requires coordination with the Fairfax County Park Authority and the Planning Department. Additionally, support for Active Transportation requires maintenance and upkeep of existing facilities (e.g., trails and sidewalks), many of which were constructed in the1960s and 1970s.

Travel Choices

The impact of the COVID-19 pandemic on transportation and travel within Fairfax County has been significant, and primarily resulted in substantial reductions in vehicle trips and use of all forms of mass transit. In 2018, the Washington, DC area was ranked as having the 2nd worst traffic among U.S. cities, and the 19th worst traffic among all cities globally, but in 2020 these rankings improved significantly to 12th worst in the U.S. and 89th worst globally. The situation continued to improve in 2021 with the area ranking 13th worst in the US and 98th worst globally. To quantify this change, the hours lost due to congestion for workers, which currently stands at 44 hours per year, has declined by 65% from pre-COVID levels.[15][16][17] 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, but with the push in 2022 by many employers to have employees return to the office at least part-time, EQAC assumes that this trend will be reversed at least in part, and that the hours lost to congestion will increase substantially in 2022 and beyond.

Each of the mass transit options available in Fairfax County has its own focus and role to play in reducing 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 further reductions as major changes took hold in work practices and commuting patterns.[18] 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 2021, though in late 2021 some employees did begin returning to offices at least part-time. This trend continued into 2022, and by mid-2022 most companies had their offices open to employees, though the number of employees returning to work in offices varied based on company policies and personal preferences. 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 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.

[15] 2018 Traffic Scorecard Report, INRIX, 2018. http://inrix.com/scorecard-city/?city=Washington%2C%20DC&index=19

[16] 2020 Traffic Scorecard Report, INRIX, 2020. https://inrix.com/scorecard/

[17] 2021 Traffic Scorecard Report, INRIX, 2021. https://inrix.com/scorecard/

[18] 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

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 or safe transit options (actual or perceived). While attempts to reduce SOV trips by shifting travelers to alternative forms of travel will continue, the likelihood of achieving significant reductions is presumed to be small. As a result, the greatest opportunity to significantly reduce the environmental and public health impacts of transportation in the county is likely to come from 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, such a transition is likely to have minimal impact as the number of private vehicles in the county dwarfs the size of the county fleet, yet 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), 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 contributions for WMATA's capital requirements in FY 2022 is $47 million, including debt service payments, and this is expected to reach over $49 million by FY 2027.[19]

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. The proposed FY 2022 budget for VRE recommends no change in the jurisdictional subsidy from FY 2021 levels, meaning the contribution from Fairfax County would total approximately $6.4 million, which accounts for 34.9% of jurisdictional contributions.[20] At the time of publication of this report the final FY 2022 budget was not yet available, so it is possible this amount could change.

The Fairfax Connector bus system is fully funded by the county, and in FY 2023 a total of approximately $130 million was allocated for system expenditures – a more than 11% decrease from the FY 2022 revised budget of $147 million. This decrease is largely the result of

[19] WMATA Capital Program Overview. https://wmata.com/initiatives/capital-improvement-program/overview.cfm
[20] VRE Financial Information. https://www.vre.org/about/financial-information/

reductions in capital expenditures, which had increased substantially in FY 2021 and FY 2022 and are now returning to earlier levels.[21]

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 including the east-west trail being constructed parallel to I-66 that will connect Gallows Road to Centreville.

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.

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 | Age: 2 years | Status: Making progress

   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 accepted 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

[21] Fund 40000, County Transit Systems, Department of Transportation FY 2023 Adopted Budget Plan: Performance Measures. https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2023/fy2023-adopted-package.pdf

truck/SUV category, which accounts for more than 70% of all new vehicle sales[22]).[23] In addition, the recent spike in gas prices has fueled increased interest in EVs among consumers, presenting a unique opportunity to more heavily promote and incentivize their purchase.

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) 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.[24]

In response to this recommendation in the 2021 ARE, county staff indicated concurrence with the recommendation and noted steps were being taken to implement it through "short-term and long-term CECAP implementation plans." Staff also noted that "given the significance of EVs to the achievement of carbon emissions reduction goals, these plans will include education, outreach and public engagement initiatives regarding EVs that will begin in 2022 and continue thereafter." EQAC appreciates the intention of staff to move ahead with implementation of this recommendation, though at the time of publication of this report EQAC is not aware of any specific plans that have been shared related to this goal.

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. Further, the BOS should provide the staff positions needed to implement the Safe Streets for All Program which the BOS unanimously endorsed on May 10, 2022.**
Recommendation: 2TRANS-2021.2 | Age: 2 years | Status: Making progress

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

[22] https://www.statista.com/statistics/199980/us-truck-sales-since-1951/
[23] https://insideevs.com/reviews/443791/ev-range-test-results/
[24] https://www.mwcog.org/purchasing-and-bids/cog-bids-and-rfps/2021/07/26/rfp-21-019---support-for-evpc-pilot-program/

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.

In response to this recommendation in the 2021 ARE, county staff indicated concurrence with the recommendation and noted that staff are developing short- and long-term CECAP implementation plans that it anticipates presenting to the BOS in 2022 and beyond. EQAC appreciates that county staff are taking these several actions and would like to see a formal plan be presented to the BOS by the end of 2022 that clearly identifies the approach to be used to meet the 2030 goal and that specifies interim goals for 2024 and 2027 to ensure that progress can be measured.

III. WATER

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."

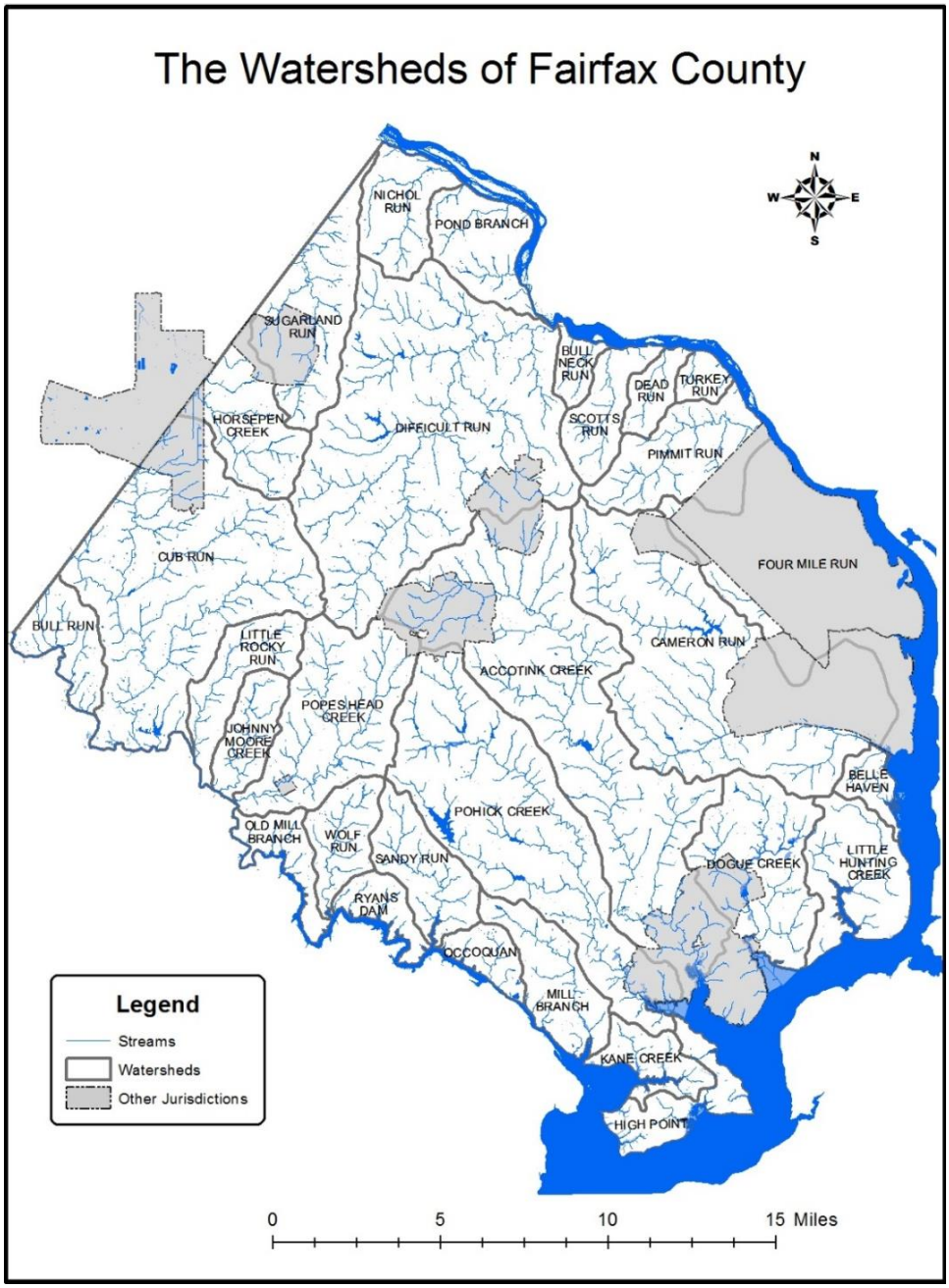
> *"Water is the essence of life – without it, life on our planet would not exist. The availability of clean water and presence of functioning aquatic systems are fundamental to sustaining viable ecosystems and human societies. Fairfax County's natural aquatic resources are vast; its 30 watersheds encompass 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 Columbia. All of Fairfax County ultimately drains to the Potomac River, which drains to Chesapeake Bay.

[25] 2017 Fairfax County Environmental Vision, Section 2 C, pg. 17, http://www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf#page=23

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 citizens, 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. Stormwater management also involves protecting homes and infrastructure from flooding.

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.

There are three areas of significant concerns addressed in this chapter that merit recommendations or comments.

1) Salt in our waterways and drinking water, particularly in the Occoquan basin.

2) Support for and expansion of policies and ordinances that protect the drinking water supplies and natural resources of the county. These become even more important in light of climate change and added flooding.

3) Adequate monies through rate increases to address expanding stormwater needs for flood control and other emerging requirements and for increases in salaries for attracting and retaining personal within the Department of Public Works and Environmental Services (DPWES).

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.

Although Fairfax Water produces safe and high-quality drinking water that meets all current standards, some water-quality concerns are appearing at the National level. For example, the U.S. Environmental Protection Agency (EPA) recently released four drinking water health advisories[26] for per- and polyfluoroalkyl substances (PFAS). While these advisories do not carry the force of regulations, they nevertheless indicate a need for watchfulness over possible future monitoring or treatment requirements.

[26] https://www.epa.gov/newsreleases/epa-announces-new-drinking-water-health-advisories-pfas-chemicals-1-billion-bipartisan

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[27].

There is one United States Geological Survey (USGS) groundwater monitoring well in Fairfax County[28] that is part of a larger USGS monitoring system of 174 wells found throughout Virginia.

RECOMMENDATIONS

1. **Continue and enhance the protection of the Occoquan Reservoir, as needed**
   Recommendation: 3A-W-2021.1 | Age: 2 years | Status: Making progress

   Justification and Background:
   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.

[27] State Water Control Board's 9VAC25-600-20. Declaration of groundwater management areas: https://law.lis.virginia.gov/admincode/title9/agency25/chapter600/section20/

[28] Location 385638077220101: https://waterdata.usgs.gov/monitoring-location/385638077220101/#parameterCode=72019&period=P7D

The Occoquan Basin, in contrast to the large, multistate Potomac River Basin, lies almost entirely within Fairfax, Prince William, Fauquier, and Loudoun Counties. Moreover, the Occoquan Reservoir sits at the mouth of the basin and thus the reservoir and the Griffith Water Treatment Plant must deal with any untreated pollutants from the entire basin.

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: 3A-W-2021.2 | Age: 2 years | Status: Making progress

Justification and Background:

Emerging Contaminants: The Occoquan Watershed Monitoring Lab budget was increased around 2019. However increased budget allocations will be needed for the lab to continue 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 Health Department 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 since FY 2017. The results available for calendar year 2016 indicate that it was an excellent year, as no SOCs 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 SOCs 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 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, the County may need to implement a salt management program focused on any or all of these steps: reducing salt inputs, timing withdrawals to limit salt intake, blending the water with other sources, or treating water with reverse osmosis. Some of these options, especially reverse osmosis, could be very expensive. To address this issue throughout the Northern Virginia region, the Virginia Department of Environmental Quality (VDEQ) 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 and Fairfax County are active participants 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.

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 (NMCPCP) 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 UOSA, DC Water, and Alexandria Renew Enterprises governing boards.

Wastewater produced within the ASSA (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 NMCPCP 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 NMCPCP 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 on the plant site 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 ballfields.

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, maintenance, and overall management of the sewers, force mains, pump stations and metering stations; leading the asset management 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 basement 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 Project & Assets Branch (PAB) is responsible for planning and overseeing implementation of full lifecycle asset management practices, including rehabilitation, repair, and capital improvements. As part of the collection system's asset management program, the CCTV Inspections Group performs routine inspection of the gravity system to detect defects in the sanitary sewer system using specialized CCTV equipment and make repair and maintenance recommendations. These recommendations are incorporated into WCD's maintenance programs as well as the Capital Improvement Program (CIP). An imperative highlight from the CIP is the utilization of trenchless technologies to rehabilitate pipes throughout the system performed by Rehabilitation Group. This technology provides significant cost savings over traditional open cut repairs, with the additional benefits of reduced disruption to residents, the surrounding environment and traffic.

3. 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.

4. WCD is investing in new technology to support its operation, maintenance, and overall management of the collection system. The organization is currently implementing a new geographic information system (GIS) centric computerized maintenance management system (CMMS) to replace and modernize its current system. In addition, WCD is monitoring and investing into new technology such as artificial intelligence to introduce efficiencies, improve effectiveness and service delivery to the residents of Fairfax County.

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 on 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 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. UOSA's *Drinking the Water* video on Vimeo (https://vimeo.com/130536179) 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 upstream of the Occoquan Reservoir. UOSA continues to meet its performance criteria. Additional information can be found on the USOA website: https://uosa.org/typical-water-product-quality/. 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.

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. This may include the necessary increases to hire and retain adequate wastewater personnel.**
   Recommendation: 3B-W-2021.1 | Age: 2 years | Status: Making progress

   Justification and Background:
   In a conversation in July 2022 with the Director of DPWES, Chris Herrington, it was stated that there was a 38% vacancy rate in positions within wastewater. The county needs to have industry competitive salaries to attract and retain personnel.

   The NMCPCP has been a leader in sewage treatment due to significant upgrades throughout the years. 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 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

   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**
   Recommendation: 3B-W-2021.2 | Age: 2 years | Status: Making progress

   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. PROTECTING AND RESTORING STREAMS, PONDS & LAKES

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), salts from winter deicing of impervious surfaces, 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 reduces 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 cleaner local streams and Occoquan Reservoir, a healthier Potomac River, and ultimately, an improved Chesapeake Bay ecosystem.

CURRENT STATUS

Monitoring

Monitoring Streams

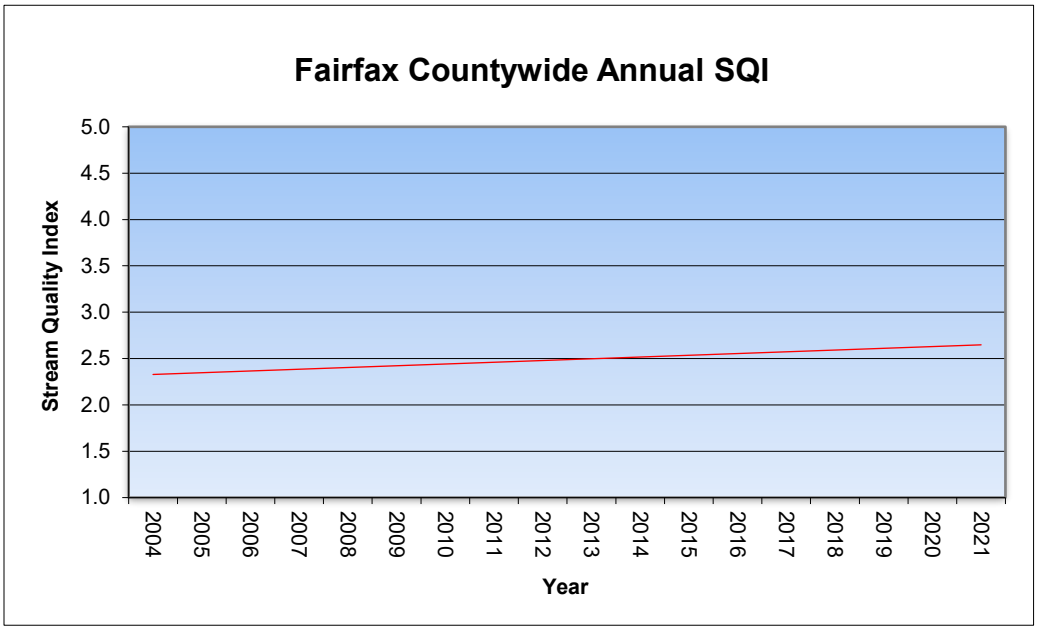
The Fairfax County Department of Public Works and Environmental Services (DPWES), Fairfax County Park Authority (FCPA), Virginia Department of Environmental Quality (VDEQ), U.S. Geological Survey (USGS) and local water treatment plants and other organizations regularly conduct water quality monitoring 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: The Stream Quality Assessment Program** – born 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 80% 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, August 2022

- **The bacteria monitoring program** included in this annual problematic monitoring 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 countywide 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/stormwater/stream-physical-assessment.

- **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 calendar year 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.

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 characterize the water quality, evaluate the effects of periodic dredging on lake conditions, and to provide information on best management practices for these lakes. By monitoring the lakes over time, it has been shown that dissolved oxygen concentrations strongly stratify during the growing season, and that dredging can lower nutrient, chlorophyll, and suspended solid concentrations (in the water column) but that these concentrations tend to trend back up over time, post dredge.

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 identified as opportunities to help restore and protect our vital natural resources.

Fairfax County Watershed Projects and Stream Restorations
Data suggest that the most cost-effective means of achieving nutrient (total nitrogen and total phosphorous) and sediment reduction goals (total suspended solids) is through stream restorations. The county has completed 208 stormwater projects treating about 41,000 acres and restored over 94,000 linear feet of degraded streams since July 2009. The county often leverages resources and has obtained over $31 million in grant funding from the Virginia Department of Environmental Quality through the Stormwater Local Assistance Fund (SLAF) for 26 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.

Salt (Chloride) TMDL

There is growing regional and local concern about the amount of salt accumulating in our soils and entering our waterways and negatively impacting our water ecosystems. In 2018, Fairfax County, other Northern Virginia localities, organizations, and community groups assisted VDEQ with the development of the Salt Management Strategy to reduce the amount of salt entering our waterways. The county is working with the Metropolitan Washington Council of Governments (MWCOG) and Northern Virginia Regional Commission (NVRC) to develop educational materials regarding salt application and management. A summary of the collaborative effort can be found at the following link: https://www.deq.virginia.gov/home/showdocument?id=4408. The Salt Management Strategy will help Fairfax County to develop a chloride TMDL action plan for Accotink Creek as part of the county's next MS4 permit. For additional information on salt, please visit the Metropolitan Washington Council of Governments webpage on Winter Salt Smart, their outreach and education portal: https://www.mwcog.org/environment/planning-areas/water-resources/outreach-and-education/winter-salt-smart/.

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

The New Alexandria, Belle View, and Riverview neighborhoods are susceptible to tidal flooding. Notably, tidal surges from Hurricane Isabel in 2003 caused extensive damage to the communities and posed a significant risk to the residents' safety. In 2022, the United States Army Corps of Engineers (USACE) completed the Metropolitan Washington Coastal Storm Risk Management Study and identified flood mitigation measures to protect the region. The Tentatively Selected Plan (TSP) included a levee and floodwall to reduce flood risk in the Belle Haven community. The USACE TSP completed a public and agency comment period and is currently under USACE review. 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 project can be obtained by going to: https://fairfaxcounty.gov/publicworks/huntington-levee.

Flood Risk Reduction Program

The County has several active flood risk reduction activities and an ongoing interdepartmental effort to develop a comprehensive countywide flood risk reduction plan. DPWES currently

manages 39 active flood mitigation projects, is modeling and mapping approximately 813 stream miles with County-regulated floodplains of 70 acres or more and is working with the Federal Emergency Management Agency to provide outreach on the updated Flood Insurance Rate Maps. Land Development Services developed a localized flooding mitigation policy for infill lot development and supported the creation and enhancement of GIS-based tools to help identify flood prone properties during the plan review process. DPD continues to encourage stormwater management practices above the regulatory requirements on properties going through the zoning application and development review process that are located upstream of known drainage issues. LDS issued a letter to industry about residential infill. Detention is now being required on single residential lots that are generating certain levels of runoff. See: https://www.fairfaxcounty.gov/landdevelopment/stormwater-management-design-residential-infill-lot-grading-plans. In July 2022, County departments presented to the Board of Supervisors Environmental Committee on recommended options to reduce flooding risks for existing and future development. In that presentation it was noted that the county's flooding and drainage service requests indicate that urban flooding is a concern across many of the areas of the county; 97% of the service requests are urban flooding requests (located outside of floodplains). It is essential to consider both the delineation and protection of floodplains along with the flood mitigation efforts addressing urban flooding. The strategies in the Resilient Fairfax plan address the issues of both floodplains and urban flooding.

Stormwater Management Facilities and Infrastructure Maintenance and Repair
There are over 8,000 stormwater management facilities in Fairfax County's inventory. Much of the inventory consists of ponds, 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 every 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 19 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 up to 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, includes over 1,400 miles of pipes, 200 miles of constructed open conveyance channels, and almost 69,000 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. For more information on how many inspections were conducted during the fiscal year, please visit the MS4 Annual Report, found at: https://www.fairfaxcounty.gov/publicworks/stormwater/ms4-program-plan-and-annual-reports.

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. Fairfax County continues to explore ways to partner with VDOT on potential stormwater management enhancements that go beyond minimum state regulations and better reflect the County's more stringent stormwater management requirements. Under the County Safety and Operation Improvement Fund (CSOI), VDOT partners with DPWES Stormwater to address maintenance level stormwater drainage projects. Recently, on the VDOT 495 Express Lanes Northern Extension project, VDOT provided funding to support the County's restoration of a segment of Scotts Run stream that will be impacted by the transportation improvements.

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 (https://www.fairfaxcounty.gov/publicworks/stormwater) 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 keeping streams clean through the removal of litter and non-native invasive plant species, maintaining 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. Support and enhance policies and ordinances protecting streams, floodplains and designated Environmental Quality Corridors (EQCs)

Recommendation: 3C-W-2021.1 | Age: 2 years | Status: Making progress

Justification and Background:

The protection of environmental assets is an essential part of resiliency planning in the face of climate change. EQAC urges that where possible these policies and ordinances should be enhanced. 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 EQC policy of the Comprehensive Plan, the Chesapeake Bay Preservation Ordinance, the Occoquan Reservoir protections, and the Stormwater Management Ordinance.

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 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.

In July 2022, County departments presented to the Board of Supervisors Environmental Committee on recommended options to reduce flooding risks for existing and future development. In that presentation it was noted that "the county's flooding and drainage service requests indicate that urban flooding is a concern across many of the areas of the county; 97% of the service requests are urban flooding requests (located outside of floodplains). It is essential to consider both the delineation and protection of floodplains along with the flood mitigation efforts addressing urban flooding.

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 (e.g, the recent Agrotourism allowance and the Prince William County Comprehensive Plan proposals data center overlay), 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 citizens 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.

The county has added and proposed additional programs that integrate green infrastructure and nature-based solutions. These practices provide multiple benefits to reduce flooding, heat island effect and greenhouse gas emissions, improve water and air quality, and provide human health and ecological benefits. Resilient Fairfax recommended strategies include:

- Develop a Consolidated Natural Resources Management Plan
- Pursue Green Infrastructure Projects That Provide Climate Resilience Benefits
- Pursue Updates to the Comprehensive Plan to Enhance Resilience
- Expand Targeted Tree Plantings
- Pursue and Implement a Flood-Risk Reduction Plan for The Fairfax County Community
- Encourage Heat-Resilient Design, Development, Upgrades, and Practices
- Update Capital Improvement Program Process to Include Climate Resilience.

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 the county's existing policies and regulations.

2. Increase funding for the stormwater Program be either by an increase in the Stormwater Service District rate in FY 2024 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 occurs through a change in the tax rate
Recommendation: 3C-W-2022.1 | Age: Recurring yearly

Justification and Background:
EQAC commends the Board of Supervisors for its actions in 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 $95 million for FY 2023.

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.

COMMENTS AND CONCERNS

1. *Concerns About Salt in Drinking Water Due to Stormwater Runoff*
   While the county is in the process of implementing the Salt Management Strategy (https://www.deq.virginia.gov/home/showdocument?id=4408), it is important to note rising salt levels is an ongoing problem for both drinking water and stormwater and needs to be carefully followed and additional steps taken where possible.

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."[29]

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 lessening 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* targets 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.

[29] 2017 Fairfax County Environmental Vision, Section 2 D "Waste Management" https://www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf#page=26

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 Collection Districts.
- *Single stream recycling*. In addition to the County Sanitary Collection District recycling, most County residents have single stream recycling available to them. With single-stream recycling, recyclables including newspaper, cardboard, plastic, aluminum, junk mail, etc., are placed in a single bin for recycling. These recyclables are collected by a single truck and taken to a Materials Recovery Facility (MRF) to be sorted into various commodity streams for sale to markets. A separate truck typically collects additional municipal solid waste that has not been separated for recycling.
- *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 accepts food waste at the I-66 Transfer Station and the I-95 Landfill.
- *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.
- *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 (MWCOG). 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.

- *Disposable Plastic Bag Tax* Effective January 1, 2022, disposable plastic bags provided at point of sale to consumers at grocery stores, convenience stores and drugstores in Fairfax County are subject to a five-cent tax. To avoid the tax, consumers may use reusable shopping bags. Paper bags are not subject to the five-cent tax, although certain retailers may have their own fees for paper bags. The purpose of the tax is to curb our collective use of disposable plastic bags, to reduce the amount of plastic waste in our local waterways, roadways, and open spaces and the damage it causes.

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. Data on recycled material is collected from a variety of sources and reported to Virginia Department of Environmental Quality (VDEQ). The system for reporting to VDEQ contains complex credits and adjustments. The data reported below does not contain these modifications to the raw data. The reported total recycling rate shown below is similar to that reported to VDEQ at just below 50%.

The data indicates yard waste is by far 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 recycled municipal solid waste appears to be from residents. Data is not available for residences alone but is estimated to be less than 10% in 2021. The best available data for residences is based on the "commingled" waste category together with glass recycling. Commingled waste is the material that residences and businesses source separate for single-stream recycling. Comingled waste together with glass is estimated at 23% of the total municipal solid waste.

How much municipal solid waste was recycled in 2021?

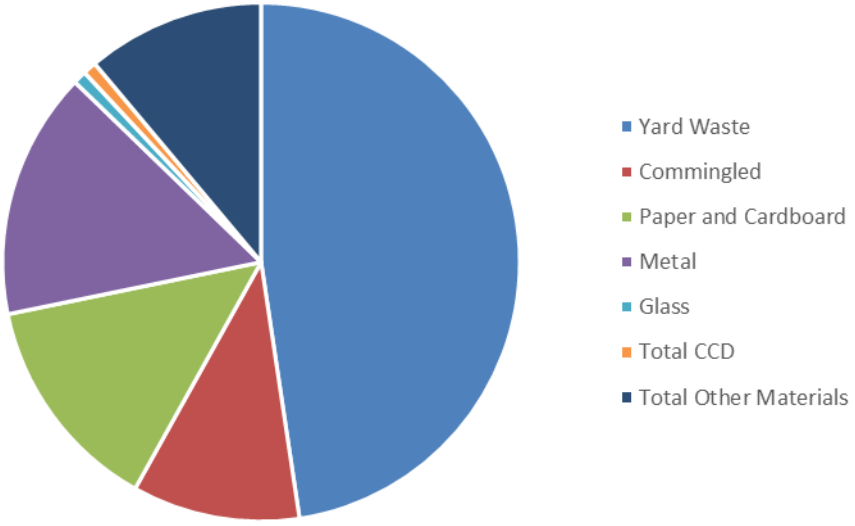
Of the MSW, less than a quarter was recycled in 2021 as comingled solid waste, including the county's glass recycling program. However, the comingled recycling increased by over 30%, as inferred by the percent change in commingled waste from 2020 to 2021. Other significant changes include:

- Purple bin glass recycling increased by 29%.
- Food Waste recycling increased by 18%.
- Notably more food waste is recycled than glass.
- CCD (construction material) recycling deceased by over 50%.

Recycle, MSW and Construction Debris Data from 2012-2021 SWMP Reports to Virginia DEQ

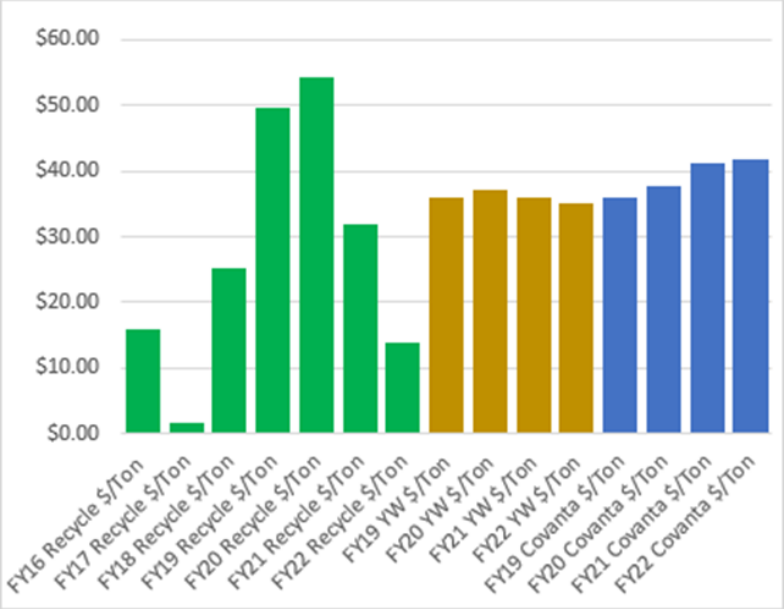
Recycled Material	2021	Historical (2012-2020) Average	Historical (2012-2020) Maximum	2021 Comparisons 2020 2021 Change	2021 Comparisons 2021 % Max	2021 Item % of total recycled
Yard Waste	197,869	209,019	243,927	-6%	86%	40%
Commingled	67,861	98,417	157,038	32%	29%	9%
Paper and Cardboard	51,674	89,471	116,547	-17%	52%	11%
Metal	71,875	59,812	77,637	5%	88%	13%
Glass	5,197	1,560	5,197	29%	71%	0.7%
Food Waste	14,379	7,769	14,379	18%	82%	2.2%
Total CCD	61,882	66,075	125,471	-51%	74%	18%
Total Other Materials	52,557	35,426	54,996	29%	68%	7.0%
Total Recycled	523,294	564,960	647,450	-2%	82%	100%
Household MSW	250,110	255,641	261,172	-4%	100%	49%
Comercial MSW	375,165	347,188	375,165	15%	85%	60%
Total MSW	625,275	629,277	665,509	7%	87%	109%
Total MSW and Recycled	1,148,569	1,204,162	1,312,959	3%	85%	209%
Recycled Percent of Total	46%	48%	49%	-5%	97%	
Commingled+Glass % of total Household	23%	19%	23%	29%	71%	

Figure IV-1: Distribution of Recycle, MSW and Construction Debris as reported by DEQ (2012-2021)



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 significantly less than Covanta. Note the chart below does not include transportation costs.

Figure IV-2: Summary of Estimated Recycling and Disposal Costs, FY16-FY22.



Recycling Outreach
One reason recycling has become economical again is that residents are doing a better job of keeping contaminated materials out of the recycling bin and placing that material in the general municipal solid waste bin. The county brochure shown below (provided in multiple languages on the county's site) helps residents know what to put in the recycling bin and what not to.

The County is developing an outreach initiative known as the Four Touch Points. The goal of this initiative is to improve communication between solid waste collectors and their residential customers regarding proper recycling and waste reduction best practices. Collectors will share recycling outreach and education at least four times each year. Staff will collaborate with collectors to produce materials to aid in consistent messaging.

Figure IV- 3: Fairfax County Recycling Brochure.

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 in 2021 and recycling makes the remaining material more valuable, it is still a relatively small portion of recycled household material.

Figure IV- 4: Purple Bin Recycling.

Food Waste

In addition to permanent food waste drop-off locations at SWMP's facilities at the I-66 Transfer Station and I-95 Landfill, SWMP expanded the Farmers Market Food Waste Composting Pilot to five markets in 2021. In 2021, Fairfax County residents diverted 22 tons of food scraps from the waste stream via this program. Composting lowers greenhouse gases by improving carbon sequestration in the soil and by avoiding methane emissions.

Trash Collection Service Issues

Starting in 2019, multiple petitions have been made to the county to form or expand the existing Sanitary Collection Districts which service about 10% of Fairfax residents. Nationwide and in

Fairfax County, there is a shortage of public works labor. This shortage has contributed to a deterioration in quality collection services. Due to the current labor and supply constraints on all trash haulers, including the County, County staff is temporarily not recommending that the Board approve new sanitary collection districts. County staff is in the early stages of developing a model that will allow residents to petition to receive contracted service as part of a sanitary district. Currently, residents can petition to be a sanitary district that, if approved by the Board, would be serviced by the County hauler.

Under the model being developed, the Board could approve new sanitary collection districts that would then be serviced by a private hauler contracted by the County. There are pros and cons to this approach. One benefit is fewer trucks on the road improving safety and lowering emissions.

Environmental Impacts
Studies conducted for the SWMP have concluded that sending refuse to a local waste-to-energy (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. SWMP has contracted with technical experts to evaluate available technologies that can reduce these emissions from the Covanta facility. The recommended project has been completed according to SWMP staff.

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.

Solid Waste Collection Complaints and Litter
Residential complaints about solid waste collection are addressed by DPWES. Complaints about collection services and about litter around collection sites has been increasing substantially. Total overflowing dumpster complaints recorded by DPWES are as follows:

Number of Dumpster Complaints Received by DPWES

2019	2020	2021	Thru June 2022
1	2	19	40

At the time of this report the SWMP is attempting to determine the cause for the surge of reported litter around dumpsters.

RECOMMENDATIONS

1. **Institute Recycling Data Collection and Reporting**
   Recommendation: 4WM-2021.1 | Age: 2 years | Making progress

   Justification and Background:
   While it increased substantially in 2021, 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 require private haulers to report to their customers their annual percentage 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: 2 years | Status: Stalled

   Justification and Background:
   County streams and public land continue to be impacted by illegal dumping and litter. Complaints about litter around dumpsters have increased substantially.

   This recommendation has been modified since last year to focus on two of the previously included recommendations from EQAC's 2021 report, each of which are currently "Stalled" as of the writing of this report:
   - Support Virginia law changes for a container redemption fee ("bottle bill")
   - Enforce litter control requirements on Waste Haulers

3. **Establish Environmental Purchasing Numeric Targets**
   Recommendation: 4WM-2021.3 | Age: 2 years | Status: Stalled

   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. **Consider Environmental and Safety Benefits of Sanitary Collection Districts Petitions**
   Recommendation: 4WM-2021.5 | Age: 2 years | Status: Making progress

   Justification and Background:
   There are many factors to consider in the establishment of Sanitary Collection Districts. One of the considerations is impact on the environment and safety. 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."[30]

INTRODUCTION

Fairfax County contains roughly 226,707 acres of developable land[2]. 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 way 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** (15.2 percent; 34,582 acres)[31]
  - Most of this acreage is owned and managed by the Fairfax County Park Authority (FCPA) (23,632 acres in 2022[32]) and the Northern Virginia Regional Park Authority (NOVA Parks) (8,591 acres in 2022[33]).

[30] 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
[31] 2021 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
[32] FCPA acres as listed in the FY23 budget: https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2023/advertised/volume1/51.pdf
[33] NOVA Parks acres as listed in the FY23 budget: https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2023/advertised/cip/8-nvrpa.pdf

- **Vacant or natural** (5.5 percent; 12,489 acres) [2]
    - This land decreased by 1,313 acres between 2017-2021 due to growth pressures within the county as it is zoned for residential, industrial, or commercial uses and continues to be developed.

- **Residential** (59.1 percent; 134,028 acres) [2]
    - This significant percentage underscores the impact that private property can have on our environmental services and natural capital. Between 2017-2021, residential property in the county increased by 1,084 acres.

While not all the acreage described above can be considered equally 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.[34]

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-profits, 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 45.6 million acres of lawn [in the U.S.] in half, 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."*[35]

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 Plan[36] 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."*

[34] Green Cities: Good Health (washington.edu)
[35] https://www.highcountrygardens.com/gardening/bringing-nature-home-interview-with-doug-tallamy/
[36] Page 10: https://www.fairfaxcounty.gov/parks/sites/parks/files/assets/documents/naturalcultural/nrmp012914.pdf

CURRENT STATUS

The desire and need for residents' access to safe, outdoor green spaces has never been more apparent than in the wake of the COVID-19 pandemic. Starting in 2020, people flocked to outdoor places as a place of solace and to help improve their mental health. Since then, our local parks have seen visitation skyrocket, and, at times, the county's natural resources have suffered due to the influx of visitors.

As the county continues to develop land, it is important to actively preserve, protect, enhance, and expand its current park land and tree canopy, not only for the enjoyment of residents but also as a climate mitigation and resiliency strategy. 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 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.

Tree Canopy

The 2011-2015 Land Cover Change Analysis[37] reports that Fairfax County, at that time, had a 57% canopy coverage, however, more recent data is not yet available. Tree canopy is an important component of CECAP as well as Resilient Fairfax. One of CECAP's sector goals proposes that Fairfax County expand the tree canopy to 60% with a minimum of 40% tree canopy coverage in every census block by 2030 and a minimum of 50% tree canopy coverage in every census block by 2050, prioritizing areas of highest socioeconomic need first[38]. Similarly, in the current Resilient Fairfax draft, the goals incorporated in "Adaptive Environments Implementation Roadmaps" include a focus on enhancing the county's tree canopy.

Ecological Corridors

The county's Comprehensive Plan[39] contains strong language in support of the Board's Environmental Vision, particularly in the Environment[40] 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).[41]

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"

[37] Page 4: https://www.fairfaxcounty.gov/publicworks/sites/publicworks/files/assets/documents/tree-canopy-report-2015.pdf#page=4
[38] Page 56: https://www.fairfaxcounty.gov/environment-energy-coordination/sites/environment-energy-coordination/files/assets/images/cecap%20report%20release/cecap%20draft_designed%20report_sept%202021_release_508.pdf#page=56
[39] https://www.fairfaxcounty.gov/planning-development/fairfax-county-comprehensive-plan
[40] https://www.fairfaxcounty.gov/planning-development/sites/planning-development/files/assets/compplan/policy/environment.pdf
[41] Objective 9 of the Environment section of the Comp. Plan (link above in footnote 7) discusses EQCs.

concept integrated into the Embark Richmond Highway Comprehensive Plan Amendment[42] 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 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 capacity[43] 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, putting further pressure on understory and forest regeneration.

Additionally, non-native insects (e.g., Hemlock Woolly Adelgid, Emerald Ash Borer) and disease (e.g., Thousand Cankers Disease) are added or potential stressors to our native, ecological resources. Of emerging concern is the Spotted Lanternfly which has been found as close as Prince William County as of May 2021[44]. Fairfax County UFMD's Forest Pest Management Branch[45] addresses the wide range of 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 in Virginia 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 weeds[46] are permitted to be sold in the landscaping trade. Landowners then purchase them, dispersing them throughout the county. Unmanaged natural lands are especially impacted as wind, birds, and other forces distribute invasive plant material far and wide, disregarding property lines.

  FCPA's Invasive Management Area (IMA) program[47] 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)[48]

[42] Page 16: https://www.fairfaxcounty.gov/planning-development/sites/planning-development/files/assets/documents/compplanamend/embarkrichmondhwy/documents/2017-10.pdf#page=20
[43] https://dwr.virginia.gov/wildlife/deer/deer-management-program/
[44] https://www.loudoun.gov/spottedlanternfly
[45] https://www.fairfaxcounty.gov/publicworks/trees/forest-pests
[46] https://www.vdacs.virginia.gov/plant-industry-services-noxious-weeds.shtml
[47] https://www.fairfaxcounty.gov/parks/invasive-management-area
[48] https://www.fairfaxcounty.gov/parks/invasive-management-area/early-detection

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 focuses on a small subset of the 10 percent of land owned by FCPA.

Effectively addressing this threat requires collective action between public and private landowners. Specific needs include encouraging private landowners to address these problems on their land, facilitating improvements, and encouraging long-term management to ensure continued ecological benefits. Reston Association has set an example for others in their 2016 banning, through the covenant process, of the use of any plant on the Virginia Department of Conservation and Recreation list of invasive plants[49].

EQAC commends both the Board's FY23 budget investments in this area (e.g. increase of $50,000 for the IMA program, funding for Operation Stream Shield which helps fight invasives, funding to provide support and guidance for private landowners on water chestnut management) and the Board's passing of the new Running Bamboo ordinance which goes into effect on January 1, 2023.

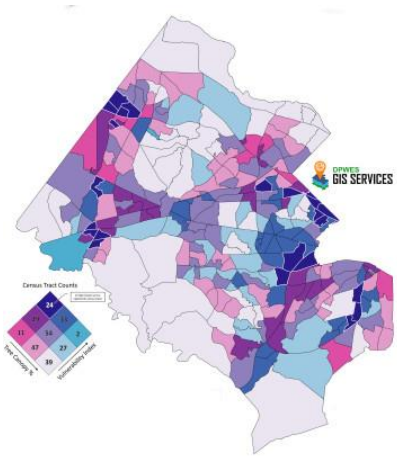
Opportunities

In addition to addressing the threats above, three general opportunities to ensure Fairfax County maintains a healthy, natural ecosystem include improving land development, maintaining a healthy and equitable tree canopy, and sufficiently funding FCPA.

- *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 designs[50] can significantly enhance an area's natural resources. UFMD's review of infill plans helps inform landowners of ecologically important features, but benefits are missed if review comes too late in the review process to influence site design. Deviations to the tree ordinance are not uncommon and proposed development plans do not require examination of natural resources first or early in the review process. While the county has a 10-year tree canopy requirement, without analysis of its effectiveness, it is not possible to know if we are achieving the tree canopy proposed in development plans. With a more commensurate fee in lieu to reflect appraised value of trees, the county could further underscore and fund the importance of our natural resources.

[49] https://www.dcr.virginia.gov/natural-heritage/invsppdflist
[50] https://www.greenroofs.com/2019/02/20/biophilia-turning-conventional-architecture-inside-out/

- *Healthy, equitable tree canopy*
  As of August 2022, UFMD was seeking to contract an update of the Urban Tree Canopy Analysis (UTC), with a new data set expected before the end of 2022. The most recent report was delivered in May 2017[51]. 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 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 map[52] (shown here) overlapping areas of existing tree canopy coverage with a vulnerability index that help identify areas with the greatest need of increased tree canopy. As new data is received, maps such as these can help drive decision making. Outreach to engage communities in areas where additional tree canopy can provide the greatest impact can be critical to the long-term success of tree plantings[53]. EQAC commends the county's work in 2022 to build on the tree planting pilot initiative that took place in the Route 1 corridor with an expanded longer-term program to further support tree planting on private property, such as individual residences and common-interest HOA and faith-based not-for-profit properties.

- *Sustained FCPA funding to support natural resources*
  EQAC commends the Board for FY23 budget allocations mentioned in the comments below. These types of investments represent a step forward in fiscal support. EQAC also commends FCPA for updating their policy documents to include restoration to their natural resource mission.

  More consistent funding to support this mission will be needed in future years. The current funding structure for FCPA continues to create challenges in supporting the long-term health of FCPA's natural resources. One-off funding sources, such as funds from proffers, donations, Environmental Improvement Program (EIP)[54], 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 lead to instability and lack the long-term security needed to effectively protect natural resources. Underscoring the discrepancy in funding

[51] https://www.fairfaxcounty.gov/publicworks/sites/publicworks/files/assets/documents/tree-canopy-report-2015.pdf
[52] Tree canopy & vulnerability map of Fairfax County developed by Fairfax County staff Yeoanny Venetsanos and Juan Reyes.
[53] https://www.bloomberg.com/news/articles/2019-01-11/why-detroiters-didn-t-trust-city-tree-planting-efforts
[54] 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

versus need, FCPA's 2016 Needs Assessment[55] 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.

RECOMMENDATIONS

1. **Improve the Land Development Process by Prioritizing Trees**
   Recommendation: 5PER-2021.2 | Age: 2 years | Status: Making progress

   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 reduce greenhouse gas emissions, mitigating heat island effects and absorbing polluted stormwater runoff. Both CECAP and Resilient Fairfax include aggressive goals that could help to be addressed through an improved land development process which prioritizes trees. If state authority could help improve this process, EQAC recommends the Board seek changes at the state level.

   Staff's 2022 responses to six recommendations included in the September 2, 2021 Tree Commission letter[56] to the Board of Supervisors indicate that some progress is being made on this front. EQAC recommends these top three items as the most actionable for the county to pursue and recommends providing sufficient funding to ensure continued progress:
   - Analyze effectiveness of the 10-year tree canopy requirement
   - Identify high priority tree planting areas using an equity lens and vulnerability index.
   - Raise the fee in lieu to reflect appraised value.

2. **Seek More Stable Funding Sources for Fairfax County Park Authority (FCPA) Initiatives**
   Recommendation: 5PER-2021.3 | Age: 2 years | Status: Making progress

   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 is excited to see progress on this front and recommends the Board continue to work with staff and the FCPA Board to seek additional means of stable, long-term funding for FCPA's natural resources maintenance activities to include program budget proposals, grant opportunities, proffers, and other funding avenues for natural resources maintenance. As was discussed with the

[55] https://www.fairfaxcounty.gov/parks/sites/parks/files/Assets/documents/plandev/parkscount/needs-assessment-plan-050616.pdf
[56] https://www.fairfaxcounty.gov/publicworks/sites/publicworks/files/assets/documents/20210902_tree_commission_policyrecommendations.pdf

Board's Health and Human Services Committee in July 2022[57], pursing a more sustainable funding model for FCPA is also directly an equity issue.

With FCPA's 17,000 acres of natural land, restoration and protection activities will continue to need additional funding support.

3. Strengthen Authority to Address Management of Invasive Species Throughout the County
Recommendation: 5PER-2021.4 | Age: 2 years | Status: Making progress

Justification and Background:
EQAC commends progress in this area and continues to encourage the county to explore what it can do to provide further support in the management of all invasive plant species. 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 Reston Association, in initial covenants of new developments.
- Seeking authority to fund matching grants through 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.

4. Support Additional Staffing for Urban Forest Management Division (UFMD)
Recommendation: 5PER-2022.1 | Status: New this year

Justification and Background:
As Fairfax County begins implementation of climate-focused iniatives related to natural resources, as identified by plans such as CECAP and ultimately Resilient Fairfax, UFMD's role and leadership will no doubt also continue to grow. For example, UFMD will no doubt be integral to achieving the 60% tree canopy CECAP goal. EQAC recommends that the Board of Supervisors support increased dedicated funding for UFMD to support these mandates, for staffing and/or programming needs. Doing so will ensure UFMD has the resources it requires for timely execution of green infrastructure related initiatives.

COMMENTS AND CONCERNS

1. Funding Support for FCPA and County-Wide Natural Resource Related Programs
EQAC commends the Board of Supervisors for the $751,000 budget approval in FY23 which

[57] https://www.fairfaxcounty.gov/boardofsupervisors/board-supervisors-health-and-human-services-committee-meeting-july-26-2022

has helped to fund FCPA's new Landscape Legacy and Sustainability Program to further invest in maintaining the extensive natural areas in the park systems. EQAC also compliments the Board for their continued and increased funding support of the EIP, which was funded at $1,298,767 in the FY 2023 Adopted Budget. This funding will go towards ecologically important programs such as the Invasive Management Area program (which saw a $50,000 increase in budget), creation of new urban green spaces, and Watershed Protection and Energy Conservation Matching Grant Program. Continued funding support for CECAP and future financial support of Resilient Fairfax will benefit the county's natural resources going forward.

2. **Appreciation for Updated Seeding Guidelines Requiring Native Plantings for County Projects**
   In July, Land Development Services released a technical bulletin which updated seeding guidelines for county projects to promote the use of native plant species and limit the use of invasive plant species in seeding applications for soil stabilization, restoration, agriculture, turf and landscaping. EQAC appreciates this commitment to restoring our local ecosystems.

3. **Recognition of Ecological Resources as a Tool for Climate Mitigation and Resiliency**
   EQAC appreciates both the inclusion of Strategy 12 ("Support Preservation, Restoration, and Expansion of Natural Systems, Green Spaces, and Soil Quality") in the CECAP list of goals as well as Resilient Fairfax's inclusion of many green infrastructure related goals. 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.

4. **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 for a second year in the recommendation in the Wildlife Management chapter, would also help preserve the county's ecological resources.

5. **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 Districts[58]
  - Fairfax County Public Schools (FCPS)
    - Policy for Environmental Stewardship (Policy #8542[59])
    - Get2Green[60] program
  - Fairfax County Wetlands Board[61]
  - Fairfax County Stormwater Management Program[62]
  - Land Development Services (LDS)
    - LDS administers the Public Facilities Manual[63] which covers several important environmental topics, including a section for Tree Conservation.
  - Northern Virginia Soil & Water Conservation District (NVSWCD)[64]
- State and Federal
  - Gunston Hall[65] (553 acres on the Mason Neck Peninsula in Fairfax County)
  - 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 Recreation[66] (1,856 acres in Fairfax County)
  - Virginia Department of Forestry (VDOF)[67]
  - Virginia Department of Environmental Quality[68]
  - Virginia Department of Transportation (VDOT)[69]

[58] https://www.fairfaxcounty.gov/planning-development/agricultural-forestal-district
[59] https://www.boarddocs.com/vsba/fairfax/Board.nsf/goto?open&id=867SG92A805A
[60] http://get2green.fcps.edu/
[61] https://www.fairfaxcounty.gov/bacs/BoardDetails.aspx?BoardID=23219
[62] https://www.fairfaxcounty.gov/publicworks/stormwater
[63] https://www.fairfaxcounty.gov/landdevelopment/public-facilities-manual
[64] https://www.fairfaxcounty.gov/soil-water-conservation/
[65] https://gunstonhall.org/
[66] https://www.dcr.virginia.gov/state-parks/mason-neck
[67] https://dof.virginia.gov/
[68] https://www.deq.virginia.gov/
[69] https://www.virginiadot.org/programs/pr-environmental.asp

  - Virginia Outdoors Foundation (VOF)[70]
    - VOF holds seven easements covering 127 acres in Fairfax County.
  - US Bureau of Land Management[71] (800 acres in Fairfax County)
  - US Fish and Wildlife Service[72] (2,350 acres in Fairfax County)

Non-Profits, Homeowner Associations (HOAs), and related initiatives

- Earth Sangha[73]
- Fairfax Chapter of the Virginia Master Naturalist Program[74]
- Fairfax County Restoration Project (FCRP)[75]
- Fairfax ReLeaf [76]
- Metropolitan Washington Council of Governments (MWCOG)[77]
- The Nature Conservancy (TNC)[78]
  - TNC owns the 233-acre Fraser Preserve on the Potomac River.
- Northern Virginia Conservation Trust (NVCT)[79]
- Plant NOVA Natives (PNN)[80]
- Reston Association (RA)[81]
  - Beginning in 2017, RA publishes 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.

Ordinances and Policies

Various Fairfax County ordinances and policies[82] 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 Ordinance[83])
- The conservation (i.e., preservation and planting) of trees during the land development process (Chapter 122, Tree Conservation Ordinance[84])
  - 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

[70] https://www.vof.org/resources/statistics/easements-by-locality/
[71] https://www.blm.gov/office/lower-potomac-field-station
[72] https://www.fws.gov/refuge/mason_neck/
[73] http://www.earthsangha.org/
[74] http://www.vmnfairfax.org/
[75] https://www.fcrpp3.org/;
[76] http://www.fairfaxreleaf.org
[77] https://www.mwcog.org/committees/regional-tree-canopy-workgroup/
[78] https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/fraser-preserve/
[79] https://www.nvct.org/
[80] https://www.plantnovanatives.org/
[81] https://www.reston.org/nature-environmental-overview
[82] https://www.fairfaxcounty.gov/landdevelopment/codes-and-standards
[83] https://www.fairfaxcounty.gov/landdevelopment/chesapeake-bay-preservation-ordinance
[84] https://www.fairfaxcounty.gov/publicworks/trees/rules

over the requirements. Deviations, in whole or 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 developer[85], 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 Manual[86] provides support for the ordinance mentioned above. It provides incentives for planting native tree species and disincentives for planting invasive tree species to meet tree canopy requirements in all development projects.
- Mitigating the harmful effects of erosion and sediment during land-disturbing activities (Chapter 104, Erosion and Sediment Control[87])
- 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 ordinance[88]; EQC Policy[89])
- Grass or lawn areas located within Fairfax County for property other than those zoned for or in active farming operation (Chapter 119, Grass or Lawn Area[90])

[85] Chapter 122, Section 122-2-6. - Exemptions and Modifications https://www.fairfaxcounty.gov/landdevelopment/codes-and-standards
[86] Chapter 12; https://www.fairfaxcounty.gov/landdevelopment/public-facilities-manual
[87] https://library.municode.com/va/fairfax_county/codes/code_of_ordinances?nodeId=THCOCOFAVI1976_CH104ERSECO
[88] https://www.fairfaxcounty.gov/planning-development/zoning-ordinance
[89] 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
[90] http://fairfaxcounty.elaws.us/code/coor_ch119

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."[91]

INTRODUCTION

Climate change is having significant impacts worldwide. 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.[92]

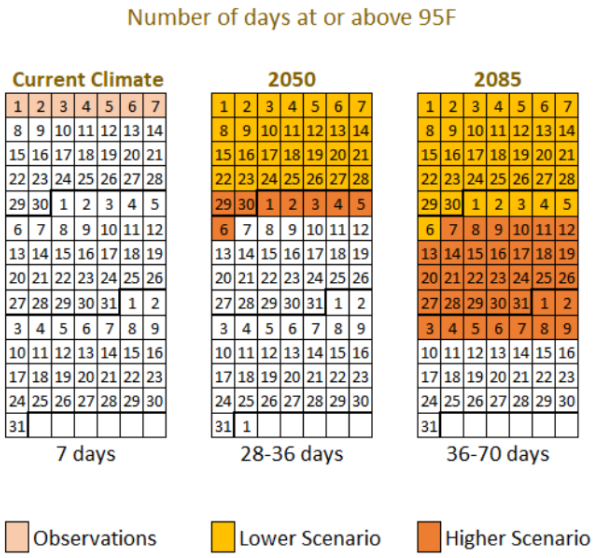
The impact of carbon dioxide and other GHGs on the climate system relative to Fairfax County is most evident in terms of extreme heat and precipitation. As shown in Figure 1, the number of days at or above 95° F [93] and extended periods of extreme heat are expected to increase in Fairfax County according 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 will inundate some coastal portions of the county.

[91] 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

[92] See: https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases. (Referenced July 24, 2021)

[93] Fairfax County. 2022. Resilient Fairfax, Climate Projections Report (Resilient Fairfax Climate Projections Report 2022 (fairfaxcounty.gov)). (Referenced October 26, 2022)

Figure VI-1: Number of Days At Or Above 95° 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).[94]



To mitigate or slow the impacts of GHG emissions, GHG emissions must be reduced. On July 13, 2021, the county adopted the Carbon Neutral Counties Declaration[95], which provides a commitment to carbon neutrality by 2040. The Community-wide Energy and Climate Action Plan[96] (CECAP), which has a target date for reaching carbon neutrality by 2050, and the County's Operational Energy Strategy (OES), which has a target date for reaching carbon neutrality by 2040, are two of the key documents to inform and guide future actions. The OES 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.

In 2022, the Resilient Fairfax plan was completed, which is a climate adaptation and resilience plan for the county and community with strategies to reduce risk to county residents, businesses, and infrastructure. The Plan details a total of 48 strategies to enhance our county's resilience. Of these, 18 strategies were prioritized. The 30 additional (non-prioritized) strategies are also important for the county to pursue to enhance our resilience. Many of the "additional" strategies are ongoing, are being pursued through other avenues, or have less of an urgent need for new attention compared to the prioritized strategies.

[94] Chart from page 24 of Resilient Fairfax plan: https://www.fairfaxcounty.gov/environment-energy-coordination/sites/environment-energy-coordination/files/assets/documents/pdf/resilient%20fairfax%20final%20carp_ada_signed.pdf#page=24

[95] See: https://www.fairfaxcounty.gov/environment-energy-coordination/carbon-neutral-counties-declaration. (Referenced July 24, 2021)

[96] 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 (Referenced August 1, 2021)

The National Aeronautics and Space Administration (NASA) has summarized the impacts that we should expect from climate change through this century and beyond.[97] 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.

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.[98] The potential impacts that have been identified by the NVRC are wide ranging and include, but are not limited to:

- Negative 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, and a swift water rescue was required to save a motorist in Fairfax County.[99] The Climate Projections Report[100] and the Climate Vulnerability and Risk Assessment[101] were completed as part of the Resilient Fairfax plan and provide up-to-date and specific information to Fairfax County.

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

[97] NASA. 2018. Global Climate Change. https://climate.nasa.gov/effects/. (Referenced September 10, 2021)
[98] Northern Virginia Regional Commission. *Sustainable Shorelines and Community Management in Northern Virginia, Phase III*, 2013.
[99] 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/2011/09/08/gIQAbKRVCK_blog.html. (Referenced September 10, 2021)
[100] Fairfax County. 2022. Resilient Fairfax, Climate Projections Report (Resilient Fairfax Climate Projections Report 2022 (fairfaxcounty.gov).) (Referenced October 26, 2022)
[101] Resilient Fairfax, Climate Vulnerability and Risk Assessment. (https://www.fairfaxcounty.gov/environment-energy-coordination/sites/environment-energy-coordination/files/assets/documents/resilient%20fairfax/vra%20combined%2007-28-2022_remediated.pdf). (Referenced October 26, 2022)

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

The CECAP report was accepted by the Board of Supervisors in September of 2021 and the Resilient Fairfax plan is scheduled to be presented to the Board this fall. While EQAC has some recommendations, EQAC believes that these plans will serve the County well in mitigating climate change and addressing its threats. Recognizing that CECAP was adopted in September of 2021, the plan has many recommendations, including some that do not directly relate to GHG reductions. Because EQAC believes that action is needed now, EQAC has reviewed the CECAP recommendations and has provided recommendations on priorities to help facilitate action. Note that some CECAP recommendations received a low priority recommendation because, while they are important for resilience, they are not expected to significantly benefit GHG reduction efforts. These recommendations for priorities were provided to the Fairfax County Board of Supervisors in a memorandum. In addition to the need for additional funding to implement CECAP actions, there is also a need for stable funding that supports multiyear efforts.

Stable multiyear funding is normally through funding in the adopted budget and including climate change related work will be important to stable funding. EQAC believes that it is important for climate-related work to be integrated as part of the county's approved budget. While some departments are providing funding for climate-related work, other departments have been dependent on carryover funding. EQAC believes that climate work is and should be a priority for the county and understands that integrating climate-related work into the approved budget should help ensure funding of this work.

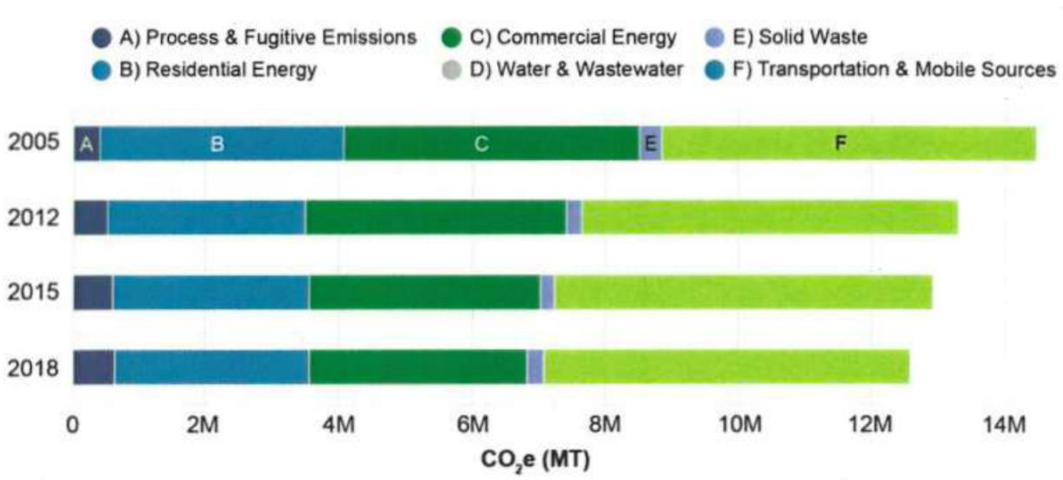
As Figure VI-2 shows, county GHG emissions have been categorized into several categories that can be useful in guiding action. While other events will decrease GHG emissions, the Virginia Clean Economy Act[102] calls for the state going to net zero by 2045 for Dominion Energy. Thus, Dominion Energy's 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 that have all been recommended in the CECAP report:

- Provide safe paths for walking and biking to encourage walking and biking.
- Promote the purchase of and provide the necessary charging infrastructure to support electric vehicles (EVs).

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

- Reduce emissions of oil, diesel fuel, and natural gas as fuel sources that create energy for residential and commercial uses by adopting policies that favor electrification of new and existing buildings and operations.

Figure VI-2: Categories of Fairfax County Emission Projected from 2005 to 2018[103]



The CECAP identifies a long-term goal of carbon neutrality by 2050 with at least an 87% reduction in total GHG emissions as compared with 2005 levels with interim goals that include reducing GHG emissions by 50% by 2030 and by 75% by 2040.

While the GHG emissions associated with electricity should be addressed by the power providers, as required under the Virginia Clean Economy Act, high level tracking should be instituted to determine the extent to which Fairfax County can rely upon the Virginia Clean Economy Act to meet Fairfax County goals.

Efforts to successfully meet GHG emission reduction goals will require the support of both the business community and residents. Businesses often see environmental stewardship as important to attracting customers and businesses sometimes adopt some of the most productive and creative approaches to environmental challenges. As such, EQAC believes that a business advisory group to the Board of Supervisors would be helpful.

Sharon Bulova, former chairman of the County Board of Supervisors, established a business roundtable, which provided a forum for businesses to share information with Sharon and the Board to further economic development opportunities that included energy efficiency, conservation, and affordable housing strategies. That group has been disbanded but recognizing that the business community is associated with a significant part of the building, transportation and other GHG emissions of the county, there is an even greater need today for a communication

[103] 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 (Referenced August 1, 2021)

channel that facilitates the exchange of ideas among businesses and raises issues to the Board so that steps to remove barriers to addressing environmental challenges are identified.

At present, there is no one place with information on the status of implementation of CECAP and Resilient Fairfax recommendations. EQAC understands that the county is building a dashboard that should provide this information, but this information is not available as of the time of the preparation of this report. If the county is resource constrained, then EQAC recommends that the CECAP recommendations prioritized by EQAC that target GHG reductions be funded first. EQAC makes this recommendation noting that at least some of the CECAP recommendations are addressed in Resilient Fairfax recommendations.

Climate change and the need to develop resilience to climate change is a priority for Fairfax residents but the resources to support the CECAP and the Resilient Fairfax recommendations are insufficient. While there are some recommendations that are being implemented now, others are awaiting either funding or perhaps prioritization. Because the Resilient Fairfax plan is organized to provide information for the implementing departments and agencies, a member of the public may need to ask county staff or wait for the public-friendly dashboard to understand that an action needed to provide resilience is included in the plan. Recognizing the need for this information for the public, County staff is developing a dashboard to see the status of both CECAP and Resilient Fairfax. Presently, there are many recommendations such as steps to protect our drinking water in the event of a countywide power outage or development of community energy or solar panels on parking lots (and elsewhere), that residents and businesses believe are important but either do not know progress is being made or assume that nothing has been done.

Given that the transportation sector is a significant source of GHG emissions, it is also important to take steps to support the growth of electric vehicles (EVs). While a number of recommendations have been provided in the CECAP recommendations, an additional step that would be helpful would be to work with the Virginia Association of Counties and the Northern Virginia Regional Commission to explore, promote, and support state and federal funding for transportation corridors so that Fairfax County residents and others traveling to various destinations in Virginia will have access to efficient (i.e., quick) charging for electric vehicles.

Fairfax County Board members hold leadership positions in these organizations to support this work. Chairman Jeffrey McKay is the immediate past president of the Virginia Association of Counties and has demonstrated leadership in the Virginia Association of Counties. Similarly, Supervisor Kathy Smith has served and is continuing to serve as an officer in the Northern Virginia Regional Commission. These two board members are well positioned to highlight and promote coordination among local governments to help promote an effective network of EV charging stations.

RECOMMENDATIONS

1. **Incorporate Adequate Funding for both CECAP Implementation and Resilient Fairfax in the Approved Budget**
   Recommendation 6CE-2022.1 | Status: New this year

   Justification and Background:
   Combating climate change is a priority and funding should be identified and incorporated into the adopted budget. Reliance upon carryover funding could inhibit the funding of priority climate work because carryover may be inadequate to support implementation needs as other programs regularly compete for carryover funding.

2. **Adopt a Climate Plan for public consumption that shows how CECAP, Resilient Fairfax and other Climate related efforts, such as VCEA, are being implemented and the progress being made towards achieving goals**
   Recommendation 6CE2022.2 | Age: New this year

   Justification and Background:
   Following review of the Board of Supervisors many more specific actions are likely to be funded and it is only reasonable that information be provided on what is funded and the progress that is being made towards both implementation and goals. Tracking and reporting are also important because the VCEA will, if successful, provide the electrical grid with renewable energy. So, it would seem critical to follow the VCEA to see how it is progressing. If it appears to be falling short in some areas, the county should seek to develop plans to address gaps in emissions reductions from the targets set in the VCEA for Fairfax County. Reviews should take place annually so that the Board and citizens can see progress and challenges.

3. **Adopt climate and energy related recommendations from other chapters.**
   Recommendation 6CE-2021.1 | Age: 2 years | Status: Stalled

   Recommendations from other chapters:
   - 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. Further, the BOS should provide the staff positions needed to implement the Safe Streets for All Program which the BOS unanimously endorsed on May 10, 2022.
   - Stormwater 1: EQAC continues to support policies and ordinances protecting streams, floodplains and designated Environmental Quality Corridors (EQCs), which should remain unchanged or be enhanced. The protection of environmental assets is an essential part of resiliency planning in the face of climate change. EQAC urges that where possible these policies and ordinances should be enhanced.
   - Ecological Resources 1: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: Improve processes to minimize ecological degradation from development

- Land Use 3: Private sector green building standards.

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

4. **The Fairfax County Board of Supervisors should seek the advice of a group of business leaders to advise the board on climate and energy issues.**
Recommendation 6CE-2021.4 | Age: 2 years | Status: Stalled

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 support state and federal funding for transportation corridors so that Fairfax County residents and others traveling to various destinations in Virginia will have access to efficient (i.e., quick) charging for electric vehicles.**
Recommendation 6CE-2021.5 | Age: 2 years | Status: Stalled

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 their journey.

Chairman Jeffrey McKay is the immediate past president of the Virginia Association of Counties and has demonstrated leadership in the Virginia Association of Counties. Similarly, Supervisor Kathy Smith has served and is continuing to serve as an officer in the Northern Virginia Regional Commission. These two board members are well positioned to highlight and promote coordination among local governments to help promote an effective network of EV charging stations.

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 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 reluctance to purchase EVs.

3. **Implement a major Community Engagement and Educational campaign on the actions that businesses and residents can do to reduce GHG emissions.**
Recommendation 6CE-2021.3 has been moved to a comment in this year's report as staff appear ready to undertake a robust outreach process once decisions are made on CECAP implementation. Efforts to address climate changes are critical to the future and community support is important. The dashboard to show the status of CECAP and Resilient Fairfax, and the status of different recommendations is critical to showing progress that is otherwise hard to see. Fairfax County residents and businesses need good information about ways that they can reduce their carbon footprint. Areas to be highlighted in the campaign include:

- Promoting the importance of vehicles, buses, and large transport vehicles that will reduce GHG emissions, especially electric 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 that use battery power.

VII. AIR QUALITY

Board of Supervisors Environmental Vision:
"*The county also will continue to support attainment of air quality through regional planning and action."*
[Excerpt from the vision statement for the Climate and Energy core service area.][104]

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. region, 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.

Over the past three decades, the region has made significant progress in improving air quality. All six pollutants regulated by the federal Clean Air Act have shown a downward trend in the region, and all are at or 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 reopened, unofficial data from MWCOG registered eight unhealthy air days in 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.

[104] 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.

CURRENT STATUS OF AIR QUALITY IN FAIRFAX COUNTY

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, D.C. metropolitan region is in compliance with all current federal air quality standards.

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 (NOx) 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. While local sources of emissions are important, outside sources also play a role in the development of ground-level ozone.

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.

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. The EPA designated the Northern Virginia area a marginal nonattainment area for the 2015 ozone NAAQS, effective August 3, 2018. Northern Virginia is part of the Ozone Transport Region and as a result, the EPA has required since 2020 that the Virginia Department of Environmental Quality (VDEQ) to implement an enhanced monitoring plan. As part of this plan, VDEQ is running the impacted ozone monitoring sites year-round and not just during the March 1 – October 31 ozone season. The metropolitan Washington, D.C. region did not attain compliance with the 2015 standard by the required August 3, 2021, date. However, the area is now in compliance based on unofficial 2021 ozone season data and MWAQC is now discussing next steps now that the 2015 standard has been achieved.

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 /m^3) and daily (35 μg/m^3) standards for fine particulate matter. Additional improvements are expected due to additional retirements of older electrical generating units and other changes that reduce the emissions of sulfur dioxide (SO_2), a precursor to $PM_{2.5}$.

Nitrogen Dioxide—NO_2

Nitrogen dioxide (NO_2) is a gaseous pollutant formed during the high-temperature combustion of fuels in vehicle engines and industrial facilities (primarily electric generating power plants). NO_2 is a factor in the production of ground-level ozone. It can irritate the lungs and lead to respiratory problems.

On February 9, 2010, the EPA published a revised NAAQS for NO_2, 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 NO_2 concentrations, and in low income or minority at-risk communities. The Washington, D.C. metropolitan region is in compliance with the NO_2 standard. The most recent 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--SO_2

Sulfur dioxide (SO_2) 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. SO_2 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 (SO_2) by establishing a new one-hour standard of 75 ppb (75 FR 35520). All monitoring data for Virginia demonstrate compliance with this standard. The EPA published the 2010 SO_2 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 SO_2. 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 since 1995.

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 $\mu g/m^3$. 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 (VDEQ) 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.

VDEQ 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. **County officials should continue efforts to strongly encourage people to telework where possible, take public transit, and use alternative forms of transit**.
   Recommendation: 7AQ-2021.1 | Age: 2 years | Status: Making progress

   Justification and Background:
   One of the key issues related to ozone 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 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. While county staff concurs with this recommendation and is taking steps to implement it, this recommendation remains an important action in helping to achieve county goals.

COMMENTS

1. 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.

2. 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."[105]
[Excerpt from the vision statement for the Parks and Ecological Resources core service area.]

INTRODUCTION

The Fairfax County Sustainability Initiatives 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." [106]

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 202[107]) 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.

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[105] 2017 Fairfax County Environmental Vision, Section 2 E, pg. 24, www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf
[106] 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
[107] Fairfax County Park Authority Policy Manual www.fairfaxcounty.gov/parks/sites/parks/files/assets/documents/administrative/park-policy-manual.pdf

CURRENT STATUS

FY 2022 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 and NOVA Parks, and other public landholders. During the FY 2022 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 2022, but managed hunts remain a viable management method for use in future years. Deer herd reduction activities in FY 2022[108] yielded 755 deer harvested for all parks, as compared to the FY 2020 season, during which reduction activities removed 982 deer and the FY 2021 season, which totaled 879 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 2022[109], 545 volunteer archers contributed 37,778 hours to the Deer Management Program for an average of 69 hours per volunteer. The county's FY 2022 archery program was organized as 18 hunt clusters, which included 103 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 2011[110]. 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. 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 staff turnover and limited personnel to dedicate to the survey development. Additionally, the COVID-19 pandemic has required staff to be more restrictive in the use of available funds. Staff are in the process of investigating funding and vendor availability to determine whether the survey can be completed in FY 2023.

[108] https://www.fairfaxcounty.gov/wildlife/deer-management-program-data

[109] Fairfax County Police Department: Emails and data from Katherine Edwards, Fairfax County Wildlife Management Specialist, Ph.D., Certified Wildlife Biologist®, August 15, 2022.

[110] https://www.fairfaxcounty.gov/wildlife/sites/wildlife/files/assets/documents/pdf/deer%20management/fy-2011-deer-management-survey-results.pdf

FY 2022 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 2022, 198 nests containing 1,066 eggs were oiled by wildlife and park staff county-wide[111].

In 2022, 95 nests containing 530 eggs were oiled on county parkland at the following parks:

- Brookfield Park (1 nest, 7 eggs)
- Burke Lake (Vesper Island) (85 nests, 484 eggs)
- Fair Ridge Park (2 nests, 11 eggs)
- Huntsman Lake (1 nest, 4 eggs)
- Royal Lake (6 nests, 24 eggs)

In 2022, 103 nests containing 536 eggs were oiled on properties under the countywide registration held by the Wildlife Management Specialist office, including: VDOT properties; Fairfax County Adult Detention Center, Fair Lakes League, Fair Oaks Mall; Fair Oaks District Police Station; Herrity Building; Crosspointe Lake; Pinewood Lake; Manchester Lakes; Burke Centre Conservancy; I-95 Landfill; Upper Occoquan Service Authority; and various stormwater management ponds. Comparatively, in 2021, 97 nests (531 eggs) were oiled on county parkland and 103 nests (530 eggs) were oiled on other properties countywide by the Wildlife Management Specialist office.

RECOMMENDATIONS

1. **Hiring of Part-Time Wildlife Assistant**
   Recommendation: 8WIL-2021.1 | Age: 2 years | Status: Stalled

   Justification and Background:
   EQAC commends the county for its effort to support staffing needs of the Wildlife Management Specialist office within FY2023. However, despite staffing increases granted in FY2022, the Fairfax County Deer Management Program and Canada Geese Management Program still require additional support to undertake 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 those outreach/educational 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.

[111] Fairfax County Police Department: Emails and data from Katherine Edwards, Fairfax County Wildlife Management Specialist, Ph.D., Certified Wildlife Biologist®, August 15, 2022.

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.

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 models and maps the built and natural environment and facilitates understanding and planning for environmental issues. 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 plan and numerous interactive mapping applications are offered to the public (including the new JADE viewer). 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. **Fund recapture of LiDAR data in 2022 to provide ongoing data for metrics on tree cover and stream erosion**
   Recommendation: 9TECH-2021.1 | Age: 2 years | Status: Making progress

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 county currently updates the data every eight years with a four-year hiatus between updates. Although the last update cycle was completed in 2022, the 8-year cycle causes the data often to be far out of date for changing areas.

2. **Prepare a plan for fully staffing GIS support positions in FY 2024 and beyond, with particular attention to Spatial Analyst IV positions**
   Recommendation: 9TECH-2021.2 | Age: 2 years | Status: Stalled

   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 expanded in FY 2024 and beyond in concert with the Enterprise Agreement, new architecture, and capabilities. The GIS Division should be expanded to ensure core duties are covered effectively and new positions available to exploit the new GIS investment. Specifically, the Division should establish two Spatial Analyst IV positions to address web GIS growth, systems management, inter-agency coordination, data maintenance/management, 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 lower-level Spatial Analyst positions should be considered to raise expectations of performance and to retain highly skilled staff to serve the environmental interests of the county.

3. **Examine planimetric data update cycle and determine a method to maintain the base map information**
   Recommendation: 9TECH-2022.1 | Age: New this year

   Justification and Background:
   The County should examine its planimetric data update cycle and determine a method to maintain the base map information used in so many environmental applications to keep it more current and relevant.

   Planimetric data are natural and man-made features observable with aerial photography captured digitally as points lines and polygons to model the existing environment. This includes buildings, paved surfaces, streams, bodies of water, and much more. The data makes up the base map for the county mapping program and is used widely in applications for environmental analysis. The county currently updates the data every eight years with a four-year hiatus between updates. The data is often far out of date for changing areas.

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 to gather environmental intelligence.

In late 2021 the county completed the four-year effort to refresh the planimetric dataset for Fairfax County, bringing the currency to 2017. 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 and 2022 has facilitated the continuation of the GIS Modernization. The GIS Database migration to a corporate class Microsoft SQL Server stack is complete. Proper disaster recovery, resiliency and backup is fully employed. The Enterprise Portal upgrade was completed in early 2022 and was a second major component of the migration. The main county GIS business portal is now scaled for performance, capacity, and resiliency. A few more modernization items remain on the agenda for FY2023, including the establishment of advanced system monitoring and map server redundancies where not employed yet. These changes once completed in FY 2023 will give the county a stable business class GIS system.

Additional funds have been secured for 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. Funding has been 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 90+ applications in the county Geoportal, 36 are environmentally focused. These applications continue to see widespread use both inside and outside the government and is a testament to continued county staff efforts at openness and public communication.

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

Table IX-1: Sessions of GEM (internal) and JADE (public) in FY 2021 and FY 2022: GEM use increased by 32% and JADE 13%

	Sessions FY 2021	Sessions FY 2022	% Change
GEM (internal)	195,733	258,030	32%
JADE (public)	133,154	283,259	13%

As part of the architecture modernization in FY 2022, the JADE was 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 ensures 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 in FY2023. JADE will also receive an aerial photography update from Spring 2022 that will include both orthophotos and obliques. We continue to receive suggestions from the public on the JADE and other applications. 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 2023.

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 180,000 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 July 2021, the FCPS Board accepted recommendations from the Joint Environmental Task Force (JET) surrounding energy, transportation, waste reduction, and workforce development for the school division (https://www.fcps.edu/news/fairfax-county-school-board-sets-goal-carbon-neutral-energy-use-2040).

Recommendations accepted by the FCPS Board included:

- Commit to being energy carbon neutral by 2040.
- Achieve 50% emissions reductions by 2030, as compared to a 2019 baseline.
- Produce 25% of the county energy use from in-county renewable energy generation by 2030, and 50% by 2040, using 2019 energy use as the baseline.
- Decrease total energy usage from all county facilities by 25% by 2030, and 50% by 2040, as compared to the 2019 baseline.
- All new county buildings and major renovation projects beginning planning and design in 2021 and after must achieve Net Zero Energy (NZE) performance as defined below, unless county staff advises the Board prior to the 30% design phase why a project cannot meet the NZE standard. The JET defines an NZE building as one that is highly energy-

efficient and produces onsite, or procures offsite as necessary, carbon-free renewable energy in an amount sufficient to offset the annual energy use associated with operations.
- Transition to electric or zero-carbon alternatives for school buses and eligible fleet vehicles by 2035; and to develop a plan to fuel the electric vehicles using non-carbon emitting fuels and carbon offsets with a complete transition to 100% clean fuel by 2030.
- Achieve Zero Waste in county and school operations by 2030.

The FCPS Energy Education Team includes all students, staff, parents and other community members who make up the totality of individuals who use FCPS sites. Energy Education Specialists are the FCPS employees tasked with involving all members of the FCPS Energy Education Team and focusing team member's efforts towards accomplishing their goals. FCPS has 10 full-time and four hourly Energy Education Specialists to perform energy management, conservation, and educational services.

FCPS continues to provide an updated public website with school-by-school energy data. Additional information about this is at http://get2green.fcps.edu/. Interested members of the community can obtain energy usage data and other relevant information for specific schools at that site. FCPS staff indicate that they are planning to have the dashboards for "District Overview", "Recycling and Trash", and "Greenhouse Gas Emissions" back on-line by summer 2022.

In FY 2021, FCPS spent nearly $27,000,000 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. 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. 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. FCPS is currently not using Energy Savings Performance Contracting. Should this change, FCPS will use the Virginia Department of Energy Contract found at the following URL: https://www.energy.virginia.gov/energy-efficiency/performancecontracting.shtml.

Solar Purchase Power Agreements. FCPS is anticipating moving forward in the not-too-distant future with a pilot agreement with Sun Tribe to have a rooftop solar Purchase Power Agreement (PPA) installed at Annandale HS. After the pilot, the next six sites in line are Thoreau MS, Terraset ES, Mason Crest ES, Hayfield Secondary, Robinson Secondary, and Chantilly HS. In spring 2022, FCPS requested rooftop solar PPA proposals from both Sun Tribe and IpSun for these sites but they have not been received. After that batch of six, the two solar PPA vendors will be making recommendations for the next ten sites to be queued up. As of May 2022, none of these sites have signed agreements with final terms and conditions. Master agreements are available for Sun Tribe at https://www.fairfaxcounty.gov/cregister/ContractDetails.aspx?contractNumber=4400009516 and for IpSun at

https://www.fairfaxcounty.gov/cregister/ContractDetails.aspx?contractNumber=4400009517, however staff reports that a separate contract is required for each specific site install.

FCPS bus fleet. 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.

Testing for lead in school drinking water systems. As of May 2022, FCPS had tested approximately 130 schools for lead in water. Middle schools are currently being tested and county staff plan to begin high school testing in September 2022. They are planning to complete testing of all schools during the 2022-23 school year.

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® program (https://www.energystar.gov/), the Metropolitan Washington Council of Government through their Regional Climate and Energy Action Plan (released in March 2017) (https://www.mwcog.org/documents/2017/03/23/regional-climate-and-energy-action-plans-2010---2020-climate--energy-climate-change-energy/) and the U.S. Department of Energy (DOE) through their Better Buildings Challenge (https://betterbuildingssolutioncenter.energy.gov/challenge).

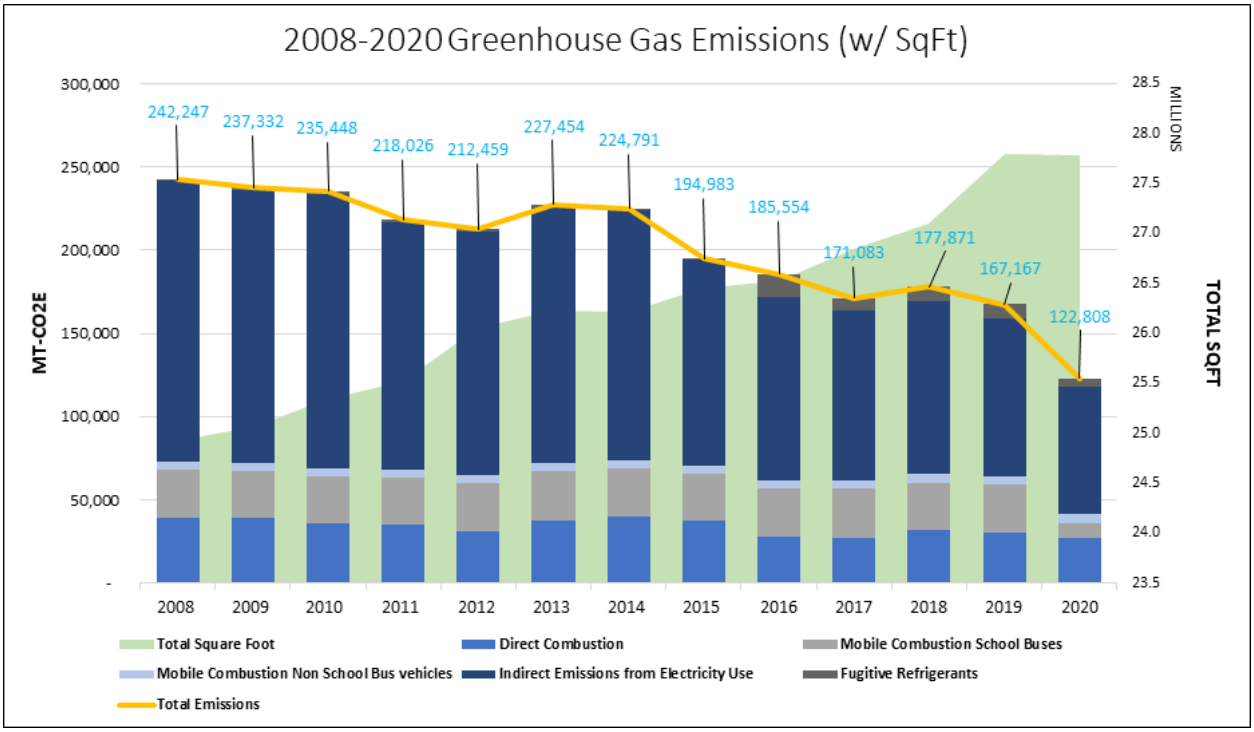
Get2Green
FCPS collaborates with a variety of community partners, including the National Wildlife Federation, Chesapeake Bay Foundation, George Mason University, NoVA Outside, Master Gardeners, and the U.S. Green Building Council Center for Green Schools, to offer professional development opportunities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

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:

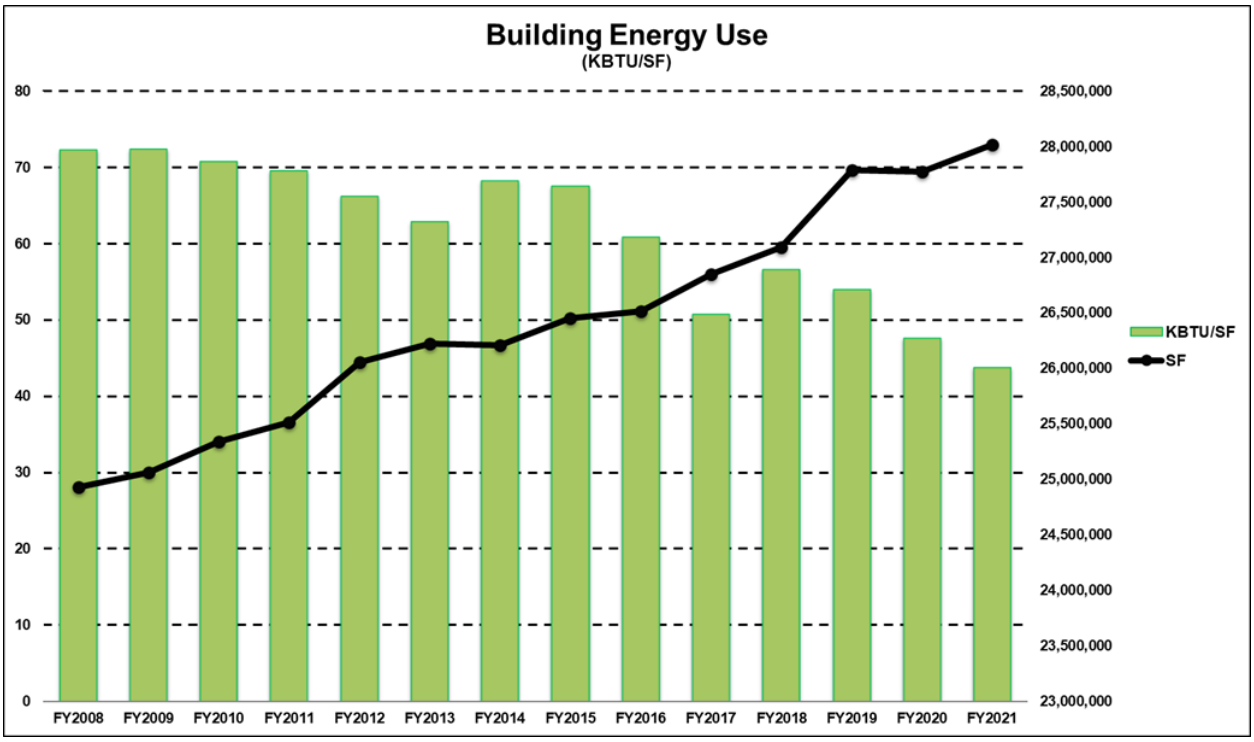
- Reduced Energy Use: According to the DOE's Better Buildings Program, in 2021 FCPS achieved an annual reduction of 25 percent in total energy use division-wide compared to 2014.
- Savings from Energy Use Reductions: A cumulative cost savings of more than $50 million has resulted from the reduced energy consumption since 2013.
- A Significant Reduction in Greenhouse Gas (GHG) Emissions (as shown in Figure A-1): FCPS has reduced GHG equivalent emissions (CO2e) by approximately 119,000 metric tons of CO2e from 2008 to 2020 (242,247 to 122,808 MT-CO2E, nearly a 50 percent reduction over a 12-year period).

Figure A-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 2021, the EUI of FCPS was approximately 43 kilo British thermal units (KBtu), compared to 72 KBtu in FY 2008, a 40 percent reduction (see Figure A-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 more than 3 million square feet of education space to accommodate that growth.

Figure A-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 practices (https://www.energystar.gov/about/content/fairfax_county_public_schools_3).

As required by School Board Policy 8542 (Environmental Stewardship), FCPS has prepared an annual GHG Inventory report (reports for years 2013 through 2020 are available at https://www.fcps.edu/about-fcps/performance-and-accountability/energy-management-program/greenhouse-gas-inventory). 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.

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 (http://get2green.fcps.edu) 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 FY23 budget includes funding for two additional positions for the Get2Green program to support equitable access to engaging environmental education opportunities across FCPS. The Get2Green staff collaborates with county and community partners, serves on committees supporting sustainability in FCPS and across Fairfax County including the joint County and Schools Zero Waste team, 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.

Data showing participation in school-based eco-activities was not available for the 2022 ARE. It was last reported as of 2019 and has not been updated since that time due to the COVID-19 pandemic. Get2Green provides a newsletter and maintains an active social media presence on Twitter to share sustainability events and resources. Get2Green has more than 10,000 newsletter subscribers and 1,000 Twitter followers.

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. [112]

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).

2. CLEAN AIR PARTNERS

www.cleanairpartners.net/

[112] 2017 Fairfax County Environmental Vision, Section 2 G, pg. 31, www.fairfaxcounty.gov/environment/sites/environment/files/assets/documents/pdf/environmental-vision-2017.pdf

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 (DPWES)
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 (NVCT)
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
RELEASE OF HAZARDOUS MATERIALS INTO THE ENVIRONMENT - ACTIVE RELEASE, DANGEROUS, OR UNKNOWN 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
RELEASE OF HAZARDOUS MATERIALS INTO THE ENVIRONMENT - NO IMMEDIATE DANGER If a known discharge of hazardous materials has occurred in the past and no lives or property are in immediate danger; this 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)
RELEASE OF ANY MATERIAL INTO THE ENVIRONMENT Any release of materials into the environment, whether hazardous or not, should be reported to the Northern Regional Office of the Virginia Department of Environmental Quality at the above number. If the release is an active one, call 911.	703-583-3800 OR 911
ILLEGAL DUMPING 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
LAND CLEARING; TREE REMOVAL; DUMPING OF FILL 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
SOIL EROSION 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
GENERATION OF DUST FROM CONSTRUCTION, GRADING, OR LAND CLEARING Contact the Virginia Department of Environmental Quality, Northern Regional Office.	703-583-3800
TRASH/DEBRIS ON 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
CONSTRUCTION NOISE 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: • 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
NOISE IN A RESIDENTIAL AREA To make a complaint about noise from animals, amplified sound, vehicles, or people, contact the following: • 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
TRASH COLLECTION BETWEEN 9:00 P.M. AND 6:00 A.M. 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
OTHER SOLID WASTE COMPLAINTS ASSOCIATED WITH WASTE COLLECTORS/HAULERS 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
ACCUMULATION OF SOLID WASTE WITHIN BUILDINGS (E.G., TRASH CHUTES IN DISREPAIR) To report a complaint, contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code.	703-324-1300

Type of Incident	Phone Number
SIGNS ON ROADS AND MEDIANS 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)
SIGNS ON PRIVATE PROPERTY 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
POORLY MAINTAINED HOMES OR OTHER BLIGHTED PROPERTIES 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
ABANDONED VEHICLES (FIVE OR FEWER) Contact the Fairfax County Police Department's Traffic Division Impound Section; e-mail: FCPDJunkVehicle@fairfaxcounty.gov.	703-280-0716
ABANDONED VEHICLES (SIX OR MORE) Contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code.	703-324-1300
OUTDOOR LIGHTING CONCERNS To report problems with glare, overlighting, or other issues, contact the Department of Code Compliance, or visit www.fairfaxcounty.gov/code.	703-324-1300
AIR POLLUTANTS 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
NO RECYCLING IN SCHOOLS Section IX of the Fairfax County School Board's Policy 8541 states that *"Schools and centers will have mandatory recycling programs for paper products, cans, and bottles. Construction waste materials will be separated and recycled."* 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.	703-764-2459

Type of Incident	Phone Number
BUSINESS OR RESIDENTIAL RECYCLING 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.	703-324-5230
HEALTH HAZARDS 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.	703-246-2201
MEDICAL WASTE 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.	703-583-3800 After hours, call 1-800-468-8892
WILDLIFE/ANIMAL CONTROL ISSUES Contact the Police Department's non-emergency dispatch number.	703-691-2131