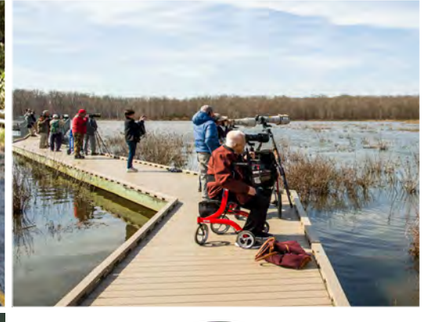
Resilient Fairfax

Climate Adaption and Resilience Plan

May 2022



NOTE: This document is a draft of the Resilient Fairfax Plan for the purposes of public comment. It is a work in progress and will be revised based on feedback collected. Please do not cite or quote.

A Fairfax County, VA publication

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A. Acknowledgements

Resilient Fairfax would not be possible without the significant contributions of the dozens of local, regional, state, and federal departments, agencies, organizations, partners, and dedicated residents who supported the development of this plan. Thank you to the Resilient Fairfax's three advisory groups (the Planning Team, the Infrastructure Advisory Group, and the Community Advisory Group), and to all other partners for their support in time and thought.

PROJECT TEAM

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PLANNING TEAM

The Planning Team was composed of technical leads and subject matter experts from 20 relevant county departments and agencies. The Planning Team was responsible for providing interdepartmental information and coordination, reviewing and providing technical feedback on deliverables, developing recommendations, and assisting the OEEC with coordination between Resilient Fairfax and related initiatives of other county departments.

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A. Acknowledgements (cont.)

COMMUNITY ADVISORY GROUP (CAG)

The CAG was composed of representatives from each of the nine magisterial districts, environmental, religious, non-profit, and civil rights organizations, businesses, residential communities, and the County's boards, authorities, and commissions. The CAG was responsible for reviewing and providing feedback on key deliverables.

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League of Women Voters: Judith Helein

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Hunter Mill: Renee Jakobs

Lee: Renee Grebe

Mason: Rafael Arancibia, Kevin Holland

Mount Vernon: Barbara Bacon, Glenda Booth

Providence: Cindy Speas

Springfield: David Skiles

Sully: Rich Weisman, Erica Carter

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WSP USA, Inc.: Dr. Rawlings Miller, Annika Ragsdale, Josh Amos, Jordyn Gross, Sienna Templeman, Mark Teschauer, Allie Reilly

NspireGreen: Anne Tyska

Additional thanks to the **National Aeronautics and Space Administration (NASA) DEVELOP** program for providing Urban Heat Island data and analysis for Fairfax County: Adriana LeCompte, W. Pierce Holloway, Rose Eichelmann, Patricia Murer, Ryan Newell, Caden O'Connell, Dr. Kenton Ross, and Lauren Childs-Gleason.

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B. Table of Contents

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B. Acronyms

AAA	Adaptation Action Areas
ACCO	Association of Climate Change Officers
AE	Adaptive Environments
ASHE	American Society of Highway Engineers
BACs	Boards, Authorities, and Commissions
BDCD	Building Design and Construction Division of DPWES
BMP	Best Management Practice
BOS	Board of Supervisors
BRIC	Building Resilient Infrastructure and Communities
CAG	Community Advisory Group
CAP	Conservation Assistance Program
CBPA	Chesapeake Bay Preservation Act
CBPO	Chesapeake Bay Preservation Ordinance
CDBG	Community Development Block Grant Programs
CDBG-MIT	Community Development Block Grant Mitigation
CDD	Cooling Degree Days
CEC	California Energy Commission
CECAP	Community-Wide Energy and Climate Action Plan
CFI	Covanta Fairfax Inc.
CFPF	Community Flood Preparedness Fund Grant Program
CH4	Methane
CIP	Capital Improvement Program
CO2	Carbon Dioxide
COG	Metropolitan Washington Council of Governments
CO-OP	Public Health Continuity of Operations
COPD	Chronic Obstructive Pulmonary Disease
Cox	Cox Communications
C-PACE	Commercial Property Assessed Clean Energy Program
CRC	Climate Ready Communities
CRS	Community Rating System
CRVA	Climate Risk and Vulnerability Assessment
CSB	Community Services Board
CZM	Virginia Coastal Zone Management
DAS	Distributed Antenna System
DCC	Department of Code Compliance
DEI	Department of Economic Initiatives
DEMS	Department of Emergency Management and Security
DER	Distributed Energy Resources
DFS	Department of Family Services
DHCD	Department of Housing and Community Development
DIT	Department of Information Technology
DMB	Department of Management and Budget
DOD	United States Department of Defense
DPD	Department of Planning & Development
DPD - PD	Department of Planning & Development, Planning Division
DPD - ZAD	Department of Planning & Development, Zoning Administration Division
DPSC	Fairfax County Department of Public Safety Communications
DPWES	Department of Public Works and Environmental Services
D-SNAP	Disaster Supplemental Nutrition Assistance Program
DVS	Department of Vehicle Services
EAP	Emergency Action Plan
EDA	Fairfax County Economic Development Authority
EDRB	Environment and Development Review Branch of DPD
EEA	Equity Emphasis Area
EEAC	Environmental and Energy Advisory Committee
EIP	Environmental Improvement Program
EPA	U.S. Environmental Protection Agency
EQAC	Environmental Quality Advisory Council
EQC	Environmental Quality Corridor
ERRF	Energy Resource Recovery Facility
ESA	Environmentally Sensitive Area
ESRFV	Empowerment and Support for Residents Facing Vulnerability
FACS	Faith Alliance for Climate Solutions
FCDOT	Fairfax County Department of Transportation
FCFRD	Fairfax County Fire and Rescue Department
FCHD	Fairfax County Health Department
FCPA	Fairfax County Park Authority
FCPS	Fairfax County Public Schools
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FMD	Facilities Management Department
GHG(s)	Greenhouse gas(es)
GI	Green Infrastructure
GIS	GIS and Mapping Services
GMU	George Mason University
H2S	Hydrogen Sulfide
HCD	Department of Housing and Community Development
HDD	Heating Degree Days
HHS	Health and Human Services
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HOAs	Homeowner Associations
IAG	Infrastructure Advisory Group
IAP	Integrated Action Planning
ICEF	Inclusive Community Engagement Framework
ICPRB	Interstate Commission on the Potomac River Basin
IDF	Intensity Duration Frequency
IUCN	International Union for Conservation of Nature
JET	Joint Environmental Task Force
LDS	Land Development Services
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LiDAR	Light Detection and Ranging
MARISA	Mid-Atlantic Regional Integrated Sciences and Assessments Team
MGD	Million Gallons Per Day
MS4	Municipal Separate Storm Sewer System
MWCOG	Metropolitan Washington Council of Governments
N20	Nitrous Oxide
NAACP	National Association for the Advancement of Colored People
NAIOP	National Association of Industrial & Office Properties
NCRF	National Coastal Resilience Fund
NCR	National Capital Region
NCS	Neighborhood and Community Services
NESC	National Electric Safety Code
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NOVEC	Northern Virginia Electric Cooperative
NVBIA	Northern Virginia Building Industry Association
NVRC	Northern Virginia Regional Commission
NVSWCD	Northern Virginia Soil & Water Conservation District
NVTA	Northern Virginia Transportation Authority
OCA	Office of County Attorney
OEEC	Office of Environmental and Energy Coordination
DEMS	Department of Emergency Management and Security
OES	Operational Energy Strategy
OPEH	Office to Prevent and End Homelessness
PFM	Public Facilities Manual
PPE	Personal Protective Equipment
psi	Pounds Per Square Inch
PT	Planning Team
PTSD	Post-Traumatic Stress Disorder
PV	Photovoltaic
RCP	Representative Concentration Pathway
RIB	Resilient Infrastructure and Buildings
RL	Repetitive Loss
RPA	Resource Protection Area
RTDS	Real Time Digital Simulators
SOPs	Standard Operating Procedures
SRL	Severe Repetitive Loss
STORM	Safeguarding Tomorrow Through Ongoing Risk Mitigation
TMDL	Total Maximum Daily Load
TPPF	Tree Preservation and Planning Fund
UFMD	Urban Forest Management Division of DPWES
UHI	Urban Heat Island Effects
USACE	U.S. Army Corps of Engineers
USBC	Uniform Statewide Building Code
VCAP	Virginia Conservation Assistance Program
VDCR	Virginia Department of Conservation & Recreation
VDEM	Virginia Department of Emergency Management
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VEPGA	Virginia Energy Purchasing Governmental Association
VMRC	Virginia Marine Resources Commission
VRA	Vulnerability and Risk Assessment
VRE	Virginia Railway Express
WMA	Washington, DC, Metropolitan Area
WMATA	Washington Metropolitan Area Transit Authority
WSCA	Water Supply Coordination Agreement
WTD	Wastewater Treatment Division of DPWES

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C. Introduction

Fairfax County, Virginia is already feeling the effects of climate change, including more severe storms, increased flooding, and more extreme heat events. Climate change is a threat multiplier, increasing both the frequency and severity of these kinds of extreme events. These climate change hazards pose threats to our county's residents, infrastructure, assets, services, and natural resources. Climate hazard events can each cost the county millions of dollars in damages, response, and recovery efforts.

Climate change is a global phenomenon fed by worldwide emissions of greenhouse gases. These gases trap heat in our atmosphere (like a greenhouse) and alter long-term global climatic patterns. It is important to address both the causes and the effects of climate change. To see how the county is reducing our county's contributions to the cause or emissions reductions side of climate change, please see the Community-wide Energy and Climate Action Plan (CECAP).

WHY RESILIENT FAIRFAX? WHY ADAPT?

This program, **Resilient Fairfax**, focuses on preparing for the *effects* of climate change. Resilience planning is critical because we are already experiencing these hazards through temperature changes, stronger storms, and increased flooding, among other hazards. These climate impacts are projected to increase in both intensity and frequency, impacting our neighborhoods, businesses, infrastructure, public services, the local economy, cultural resources, and natural environments.

Climate change impacts are costly. Responding to each of these events as they occur can cost millions of dollars. From 2010 to 2019, four severe weather events were responsible for substantial county-wide financial impacts:

- The North American Blizzard (2010) resulted in a $2 million loss
- Tropical Storm Lee (2011) cost the county $10 million in repairs to bridges and roads
- Hurricane Sandy (2012) cost the county more than $1.5 million
- The July 2019 rainfall/flooding event led to costs of $14.8 million, including $2 million in damages to Fairfax County government property

Even if all greenhouse gas emissions were eliminated globally today, the county would still continue to see some level of climate change in the future due to the level of global gases already emitted. Therefore, in all future scenarios, it is important to become resilient to climate change effects.

WHAT IS CLIMATE RESILIENCY?

Resilience is defined as the "capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption." In the context of climate change, climate resilience is the ability to prepare for and adapt to climate-related conditions, such as increasing heat waves, severe storms, and heavy precipitation and flooding.

Resilience can take many forms.

- **At the individual level,** it can look like strengthening ties amongst neighbors or making home improvements, such as flood-proofing projects or creating a rain garden in your backyard.
- **At the community level,** it can look like raising awareness of climate impacts, supporting community networks and resources, or advocating for resilience upgrades.
- **At the county government level,** it can look like preparing our infrastructure for climate hazards, working collaboratively across the region to ensure continuity of critical services, and providing resources to local residents and businesses to enhance their preparedness.

The good news is that there is a lot we can do to be resilient, and there is a lot already being done. Led by the Fairfax County Office of Environmental and Energy Coordination (OEEC), this plan is the first-ever "Resilient Fairfax: Climate Adaptation and Resilience Plan," also known as the "Resilient Fairfax Plan." The Resilient Fairfax Plan was developed with robust interagency coordination and stakeholder engagement throughout the entirety of the planning process. The plan was developed in close collaboration with county departments, regional authorities, state and federal agencies, utilities, the development community, and representatives from the environmental, religious, nonprofit, civil rights, residential, and business communities. The plan was also written in alignment with related plans, such as the regional Hazard Mitigation Plan and the statewide Virginia Coastal Resilience Master Plan.

Resilient Fairfax is envisioned to be a long-term program of iterative climate planning and implementation to help the county better anticipate, prepare for, respond to, and cope with the changing climate.

Climate change resilience and adaptation provides an opportunity for the county to reduce climate-related risks while enhancing the local green economy, strengthening our infrastructure, and addressing disproportionate vulnerabilities. Rather than reacting to climate hazards as they occur, proactively developing and implementing a long-term climate resilience plan allows the county to avoid economic, social, and environmental risks associated with climate change. Through this plan, Fairfax County will serve as a proactive leader and prepare for a more resilient, equitable, prosperous, and climate-ready future.

The planning process for Resilient Fairfax was composed of a series of analytical steps, summarized in the table below:

Climate Projections Report	**What will Fairfax County's climate feel like in 2050 and 2085? What hazards will we face?** ■ What temperature trends will we see? ■ How severe will the storms be? ■ How much precipitation will the county receive?
Climate Vulnerability and Risk Assessment	**Where is the county vulnerable to climate hazards? What are our top risks?** ■ Which of our infrastructure, populations, and systems are exposed to climate hazards? ■ Which are sensitive (may shut down) when exposed to climate hazards? ■ Which lack the adaptive capacity to easily change to cope with changing conditions? ■ Which of these vulnerabilities are most likely and severe?
Audit of Existing Plans, Policies, and Programs	**How are we currently doing in terms of climate resilience?** 1. How do our policies, plans, and programs compare to best practices? Are they meeting the needs revealed in the Vulnerability & Risk Assessment? 2. Which programs are working well and should be potentially expanded? 3. Where are the gaps or opportunities to update policies and programs?
Climate Adaptation and Resilience Strategies	**What should we do to enhance our climate resilience?** 1. Which strategies would help the county address our climate vulnerabilities and risks? 2. Which of these strategies are top priority?
Implementation Roadmap	**What is the plan to implement the priority strategies?** ■ Who is responsible for implementation of each strategy? ■ What action steps should be taken? ■ What are the estimated timeframes and costs?

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C. Introduction (cont.)

The Resilient Fairfax Plan provides a framework to guide the county's resilience action. The plan is organized under four pillars: **Integrated Action Planning, Climate Ready Communities, Adaptive Environments,** and **Resilient Infrastructure and Buildings**.

IAP	**Integrated Action Planning**	Integration of climate considerations in planning and coordination ensures resiliency is at the forefront across county initiatives.
CRC	**Climate Ready Communities**	A well-connected and prepared community is better able to respond to and recover from climate hazards.
AE	**Adaptive Environments**	Natural environments that are protected and restored improve the county's overall resilience to climate impacts.
RIB	**Resilient Infrastructure and Buildings**	Infrastructure and buildings that can withstand climate impacts, keep residents safe, and reduce service disruptions enhances countywide resilience.

These four pillars build the vision of a Resilient Fairfax County. Each pillar contains a set of goals, strategies, and implementation actions. The strategies were identified through a thorough process of engagement and technical analyses including the Climate Projections Report, Audit of Existing Policies, Plans, and Programs, and the Vulnerability and Risk Assessment. The prioritized strategies included in the Resilient Fairfax Plan aim to address the top climate change risks to the county and build a more resilient future. The strategies include proactive and collaborative planning efforts, strategic funding and implementation, infrastructure investments that account for changing climate conditions, plans for connected communities that have access to the resources they need, and strategies for protected and restored natural environments that provide a range of nature-based resilience benefits for the county and its residents. In all, this plan provides a guide to a continuously thriving, adaptable, and Resilient Fairfax.

RESILIENT FAIRFAX PLAN AT A GLANCE: HOW IS THIS PLAN ORGANIZED?

Resilient Fairfax: Climate Adaptation and Resilience Plan Development: This section summarizes the Resilient Fairfax Plan development process, including an overview of major steps and analyses. This section also provides an overview of the stakeholder and community engagement that occurred throughout the process to inform and shape the Resilient Fairfax Plan.

Climate Projections: This section provides an overview of the main findings of the Climate Projections Report, including the main climate hazards for Fairfax County and how climate conditions are projected to change in the future.

Climate Risks and Vulnerabilities: This section provides an overview of the key takeaways from the climate Vulnerability and Risk Assessment, including the top vulnerabilities of our infrastructure, populations, and systems to climate hazards.

Audit of Existing Policies, Plans, and Programs: This section provides an overview of the key takeaways from the Audit report, including identification of steps Fairfax County has already taken to build resilience, opportunities to expand, extend or accelerate initiatives and policies, and gaps where new strategies could further support county resilience.

Strategies Overview: This section introduces the four climate resilience strategy pillars: Resilient Infrastructure and Buildings, Climate Ready Communities, Adaptive Environments, and Integrated Action Planning. The section also highlights how these categories build the vision of a Resilient Fairfax and provides a summarized list of the strategies for each category.

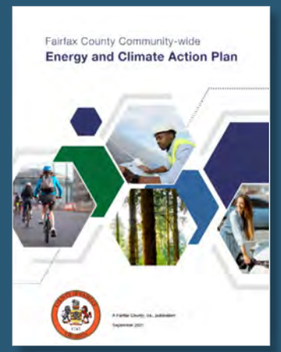
Implementation Roadmap: This section includes detailed information on each of the prioritized adaptation and resilience strategies, including implementation action steps, lead and partner departments, estimated implementation timeframe and cost, strategy co-benefits, funding opportunities, key performance indicators, and considerations for equitable implementation.

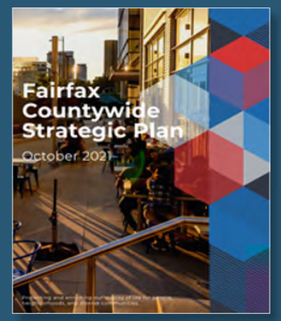
HOW DOES RESILIENT FAIRFAX RELATE TO OTHER COUNTY PLANS?

Fairfax County Community-wide Energy and Climate Action Plan (CECAP) (2021): CECAP is the county's first greenhouse gas reduction plan. CECAP is focused on the cause of climate change, while Resilient Fairfax is focused on resilience to the effects of climate change. CECAP was plan was developed by a working group of dozens of representatives from the Fairfax County community, environmental nonprofits and advocacy organizations, businesses, and other key stakeholder groups. The plan sets ambitious greenhouse gas reduction goals for Fairfax County to reduce its greenhouse gas emissions by 50% by 2030 and to achieve carbon-neutrality by 2050. CECAP has 12 areas of focus, some of which support the goals of Resilient Fairfax. For example, CECAP's strategy to "Support Natural Systems and Green Spaces" can also improve resilience to extreme heat and flooding, and is aligned with Resilient Fairfax Plan's goal, "Adaptive Environments."

Northern Virginia Hazard Mitigation Plan (HMP) (2017, 2022): The Northern Virginia Hazard Mitigation Plan (HMP) is a regional plan to address both man-made and natural disasters, facilitated by emergency management staff. Resilient Fairfax differs from the HMP by doing a deeper dive on climatic conditions specifically. Resilient Fairfax also focuses on long-term future change in conditions. County staff have collaborated to align the 2022 HMP with Resilient Fairfax. The HMP addresses several climate-related hazards, including flooding, drought, and extreme temperatures. The HMP acknowledges climate change, the amplification it has on existing hazards, and that hazards are expected to increase over the next 40 to 50 years. Similarly, Resilient Fairfax leveraged data and strategies from the HMP. Future HMP and Resilient Fairfax updates may be even more closely aligned or consolidated.

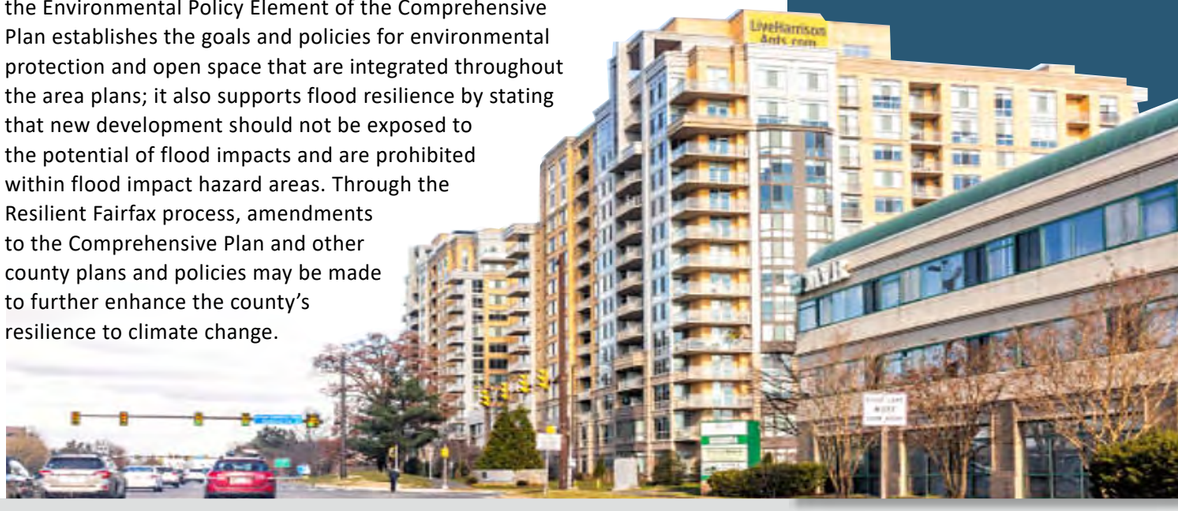
Fairfax County Strategic Plan (2021): The first ever Countywide Strategic Plan was adopted by the BOS in October 2021. The plan aims to: set a clear, unified, community-driven vision for the next 10-20 years, align and integrate existing departmental and issue specific plans, provide a tool for focusing and prioritizing initiatives over the next three-to-five years, and communicate progress on achieving measurable outcomes. Many of the Strategic Plan's priorities and strategies align with Resilient Fairfax. For example, the Strategic Plan's strategy E9 (develop a climate action plan and improve community resilience) directly focuses on climate resilience. Many other strategies indirectly enhance climate resilience by supporting resilient natural resources, health systems, and communities, including support for residents facing disproportionate vulnerability.





One Fairfax: One Fairfax is a joint racial and social equity policy of the Fairfax County Board of Supervisors and School Board. It commits the county and schools to intentionally consider equity when making policies or delivering programs and services. One Fairfax provides an accountability framework, specifies considerations to achieve equity, and aims to ensure that all persons can fully participate in the opportunities of Fairfax County regardless of age, race, color, sex, sexual orientation, gender identity, religion, national origin, marital status, disability, socio-economic status, or neighborhood. The policy establishes 17 focus areas to promote equity including community and economic development, housing, education, environment, and transportation. The One Fairfax Policy is supplemented by resources, including the Vulnerability Index, which is a countywide map to facilitate equity evaluations. One Fairfax provided the foundation for Resilient Fairfax's vulnerability data, equity considerations, and engagement approach.

Comprehensive Plan (2017): The Fairfax County Comprehensive Plan is required by state law to be used as a guide for decision-making on the natural and built environment by the county's BOS, the Planning Commission, the Board of Zoning Appeals, and others. It is also a guide for county staff and the public to use in the planning process. The Comprehensive Plan consists of the Policy Plan, four Area Plan volumes, and a Plan Map. The Policy Plan volume includes general countywide policy on land use, transportation, housing, the environment, heritage resources, economic development, and public facilities, including public parks, recreation, and trails. The Area Plans contain detailed long-range planning recommendations organized by geographic areas of the county. Although the Comprehensive Plan does not explicitly address climate, its plan and policies have indirectly helped to reduce the county's vulnerability and build resilience to climate change. For example, the Environmental Policy Element of the Comprehensive Plan establishes the goals and policies for environmental protection and open space that are integrated throughout the area plans; it also supports flood resilience by stating that new development should not be exposed to the potential of flood impacts and are prohibited within flood impact hazard areas. Through the Resilient Fairfax process, amendments to the Comprehensive Plan and other county plans and policies may be made to further enhance the county's resilience to climate change.



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D. Resilient Fairfax Plan Development

PLANNING TIMELINE

Stakeholders

- = Planning Team (PT)
- = Infrastructure Advisory Group (IAG)
- = Community Advisory Group (CAG)
- = Public Engagement
- = Board of Supervisors (BOS)

2021

FEB
- Project Kickoff

APR
- PT Kickoff Meeting,
- IAG Kickoff Meeting,
- Begin work on *Climate Projections Report*

MAY
- CAG Kickoff Meeting

JUN
- Begin work on *Vulnerability and Risk Assessment*
- PT Meeting & Public Meeting to discuss county's key vulnerabilities
- OEEC presents project update to BOS,
- Public Survey on community climate concerns opens

JUL
- Begin work on *Audit of Existing Policies, Plans, and Programs (Audit)*
- Public Survey closes

SEP
- PT, IAG, & CAG meeting to share findings from Climate Projections Report, Vulnerability and Risk Assessment, and Audit and gather feedback

OCT
- Public Meeting: Share findings from Climate Projections Report, Vulnerability and Risk Assessment, and Audit and gather feedback from community members
- Begin list of potential adaptation and resilience strategies

NOV
- PT Meeting to workshop potential adaptation and resilience strategies for Resilient Fairfax

DEC
- IAG & CAG meetings on draft adaptation and resilience strategies
- OEEC presents project update to BOS
- Begin development of Implementation Roadmaps

2022

FEB
- Public Meeting to share draft strategies and receive community feedback
- PT Meetings to review and refine Implementation Roadmaps

MAR
- IAG & CAG meetings to review Implementation Roadmaps and receive feedback

APR
- Compiling draft of Resilient Fairfax Plan

MAY
- Public Comment Period for Resilient Fairfax begins
- OEEC presents update to BOS

JUN
- Public Comment Period for Resilient Fairfax closes
- Final Plan revisions

JUL – AUG
- Final Plan revisions and accessibility compliance

SEP – OCT
- OEEC presents final Plan to BOS for approval

Work Streams

- = Climate Projections Report
- = Vulnerability & Risk Assessment
- = Audit of Policies, Plans, & Programs
- = Strategy Development & Implementation Roadmaps = Resilient Fairfax Plan Compilation

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E. Stakeholder Engagement

Project Management Team

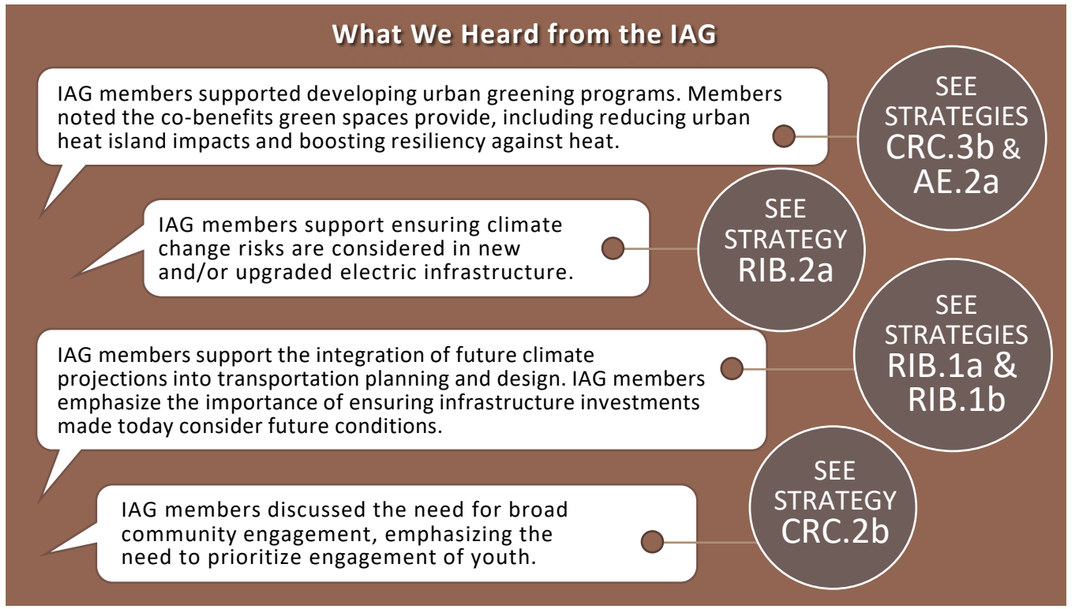
The Project Management Team included Office of Environmental and Energy Coordination (OEEC) staff who worked closely with Resilient Fairfax's key players, including the Consultant Team, Planning Team, Infrastructure Advisory Group, Community Advisory Group. The Project Management Team was also responsible for day-to-day project management and planning, general project decision-making, and final product ownership.

Planning Team

Comprised of 20 county departments and agencies, the Planning Team (PT) provided technical departmental information and subject matter expertise. They oversaw interdepartmental coordination and information sharing, as well as technical reviews and feedback on all key deliverables for Resilient Fairfax. Planning team meetings, sub-group meetings, and workshops were held throughout the process to inform plan development and gather input from PT members.

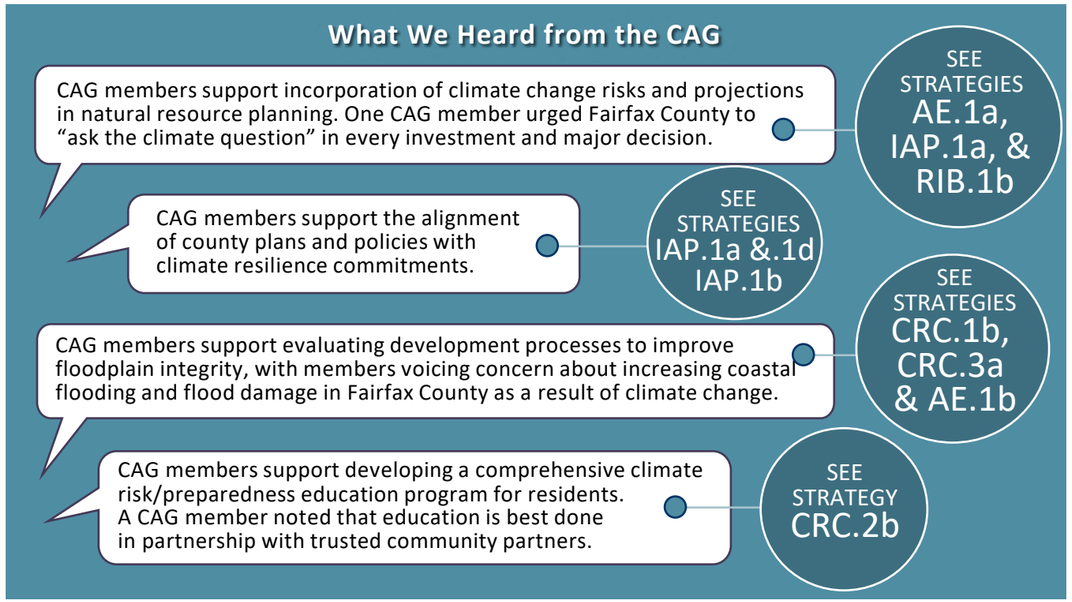
Infrastructure Advisory Group

The Infrastructure Advisory Group (IAG) was comprised of representatives from utilities, authorities, building industry groups, transportation committees, regional planning organizations, and other infrastructure managers at the local, state, and federal levels. IAG members reviewed and provided technical feedback on all major deliverables, to ensure accuracy in technical details and processes. IAG members also provided coordination among partners to share best practices and identify opportunities for future coordination on resilience related infrastructure initiatives. IAG meetings were held at key milestones to provide project updates and gather input from IAG members.



Community Advisory Group

The Community Advisory Group (CAG) was established to ensure that the Resilient Fairfax Plan reflected community priorities and insights. Comprised of residents, community members, and advocacy groups, the CAG provided reviews and feedback on all major Resilient Fairfax deliverables. The CAG also supported coordination with community members on matters related to climate adaptation and resilience. CAG meetings were held at key milestones to provide project updates and gather input from CAG members.



E. Stakeholder Engagement (cont.)

Other Advisors

In addition to the Planning Team (PT), Infrastructure Advisory Group (IAG), and Community Advisory Group (CAG), OEEC conducted regular coordination with neighboring jurisdictions, federal, regional, and state agencies conducting resilience work, professional networks of sustainability professionals, and other resilience leaders from around the country.

Fairfax County Residents

Public engagement from the Fairfax County community was an integral component of Resilient Fairfax. The public was asked to engage on several key deliverables throughout the project, including the Vulnerability & Risk Assessment, Audit, and the Resilient Fairfax Plan strategies. OEEC hosted public meetings throughout the project where community members were able to provide verbal and written feedback on project progress. The public also provided feedback through a community survey that sought feedback on the community's current climate concerns and vulnerabilities. Additionally, the process included a public comment period on the full draft compiled plan.

What we heard from the community:

- Excited about the opportunity to make us more resilient!
- I'm concerned when I see other parts of the country having to cope with extreme heat, loss of power, lack of drinking water, crops etc. and wonder if that's in our future. I'm pleased to see the county is preparing now.
- We are never going to combat climate change if we all don't do our part.
- What can individuals do?
- We are running out of time to take action if we want to mitigate the impacts we know we will face in the very near future.
- We have had trees fall across roads here during storms.
- I am interested in how to mitigate the detrimental effects of infill development on stormwater run-off.
- Please put major investment into protecting stream valleys from the increasing damage from storms and flooding.
- Please treat the climate crisis as a crisis. We need strong and bold leadership on this issue at every level of government before it is too late.
- Social resiliency is the most effective and faster strategy to implement.

Resilient Fairfax Public Survey

In summer of 2021, OEEC administered an electronic survey to county residents to better understand the community's current climate concerns and vulnerabilities. This survey was one part of the larger climate vulnerability and risk assessment that included extensive data analyses, mapping, policy reviews, and additional stakeholder engagement.

Survey Highlights:

- 600+ responses
- 45% of Resilient Fairfax Survey Takers are extremely concerned with climate change.
  - 81% are concerned about severe storms.
  - 79% are concerned about temperature changes.
  - 60% are concerned about flooding.
- 46% said they or a household member have a health condition that makes them more sensitive to cold, heat, or air pollution
- 25% of Fairfax resident survey takers have experienced flooding in their neighborhoods in the last 5 years.
  - Nearly 80% of survey takers stated they do not have flood insurance.

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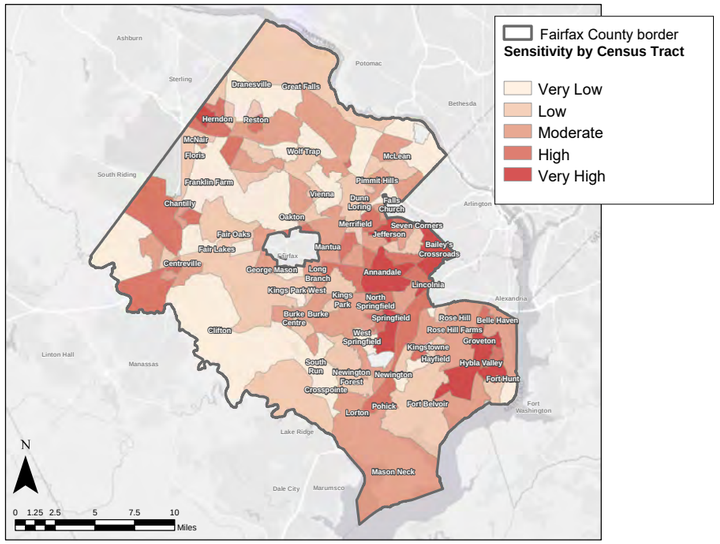
F. Equity in Climate Resilience

Equity and inclusion are central considerations when planning for climate change impacts. To build climate resilience requires addressing needs of the most vulnerable populations, considering unequal distribution of resources, and ensuring the voices of the most vulnerable populations are heard throughout planning and implementation. Addressing equity in resilience planning includes identifying existing disparities, promoting inclusive involvement, and advancing equitable outcomes that reduce climate hazard risk and build community capacity.

EXISTING INEQUITIES

Some populations are more sensitive to climate impacts and are therefore disproportionately impacted by climate change. These populations can include low-income, racial or ethnic minorities, older adults, or people with disabilities, limited English proficiency, or limited access to transportation and services, among others. These disproportionate climate burdens are not necessarily a reflection of the individuals themselves; they are frequently created as a result of historic under-investment, insufficient resources, systemic inequities and discrimination, and challenges with accessibility. These populations can often experience increased sensitivity to climate hazards and may have less capacity and fewer resources to adapt. In addition, sensitive populations may have a harder time stabilizing during and after extreme weather events and recovering from personal property damage.

Figure 1. Population Sensitivity by Census Tract



Populations identified by survey takers as being vulnerable to climate hazards

- Children
- Older Adults
- People of Color
- People with disabilities and/or
- chronic illnesses
- Individuals/families with low to moderate income
- Individuals/families without access to a vehicle
- Individuals/families with limited English proficiency
- Populations experiencing homelessness, including veterans
- Pregnant women, parents of small children
- Front line workers
- New residents without social networks
- College students
- People without internet/mobile access
- Undocumented immigrants, refugees
- People experiencing food and/or housing insecurity
- Outdoor workers
- People in low-lying areas
- Renters relying on goodwill of landlords
- Incarcerated people
- Pet Owners / Pets
- Individuals reliant upon electrically dependent medical equipment

EQUITY IN THE RESILIENT FAIRFAX PLAN

The Resilient Fairfax planning process supported the inclusion of equity by:

- Considering the impacts of climate hazards on vulnerable populations in the Vulnerability and Risk Assessment,
- Developing climate adaptation strategies and resilience measures intended to support vulnerable populations, provide aid, and support inclusive engagement in plan implementation,
- Engaging community representatives throughout the planning process to advocate for and give voice to vulnerable populations,
- Leveraging partnerships with county departments and partner organizations who already do great work in our communities.

Special attention was given throughout the development of the Resilient Fairfax Plan to seek out and consider the needs of those traditionally underserved. Consistent with One Fairfax (Fairfax County's racial and social equity policy), core approaches to advance equity through the Resilient Fairfax Plan development include:

- **Data informed planning.** Identifying and utilizing available data, such as the One Fairfax Vulnerability Index, to support more informed development and consideration of equity in the planning process.
- **Proactive action.** Taking action on climate hazards before people and assets are put at risk
- **Facilitating access.** Promoting access to opportunities including education, workforce development, housing, the natural environment, and multi-modal transportation.
- **Expanding community engagement.** Addressing underrepresentation and ensuring that the interests, ideas, and values of all people are heard throughout the planning process.
- **Building partnerships.** Identifying community leaders and working groups that can inform and strengthen equity considerations throughout the decision-making process.
- **Sharing accountability.** Continued coordination with community leaders and advisory groups during plan implementation and ensuring transparency through tracking and reporting.

Resilient Fairfax
Climate Adaptation and Resilience Plan

Community Advisory Group (CAG) Meeting 3

December 9, 2021
6:30pm

Office of Environmental and Energy Coordination CADMUS inspiregreen

EQUITY IN STAKEHOLDER ENGAGEMENT

One function of the Community Advisory Group was to ensure that Resilient Fairfax reflects the priorities and insights of the Fairfax community. The CAG's engagement aided the project team in maintaining equity at the forefront of strategy development. These stakeholders helped to shape the goals and strategies that are central to the plan, weighing in at every major step of the process.

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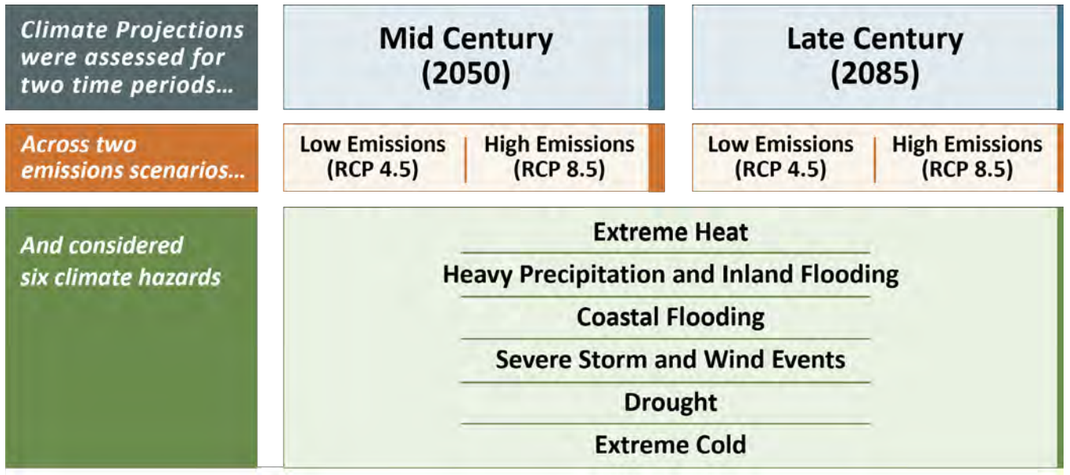
G. Climate Projections: Warmer, Wetter, Weirder

As a first step in the Resilient Fairfax process, the county completed the Climate Projections Report, which provides an analysis of projected future climate conditions and hazards in Fairfax County. The report answers the question **"what climate conditions and hazards are we likely to face in Fairfax County by 2050 and by 2085?"** The Climate Projections Report describes our future climate in Fairfax County, such as our projected temperatures, rain intensity, and storm severity, among other conditions. The Climate Projections Report describes future climate conditions for the following:

Climate Projection Report Overview



The sections below outline major findings from the Climate Projections Report. For more information, access the full technical report available here.

Representative Concentration Pathway (RCP) are used to describe and model different climate futures based on the amount of greenhouse gases emitted.

RCP 8.5 represents a "no climate policy" future with continued high reliance on fossil fuels and increasing GHG emissions.

RCP 4.5 represents a more moderate scenario where GHG emissions peak around mid-century and then decline.

WARMER

EXTREME HEAT

Average annual temperatures in Fairfax County are projected to increase significantly from present day conditions and at an accelerated rate compared to previously observed trends. Warmer, traditionally "summer" temperatures are projected to creep into the late spring and last further into the fall, contributing to more frequent extreme heat conditions.

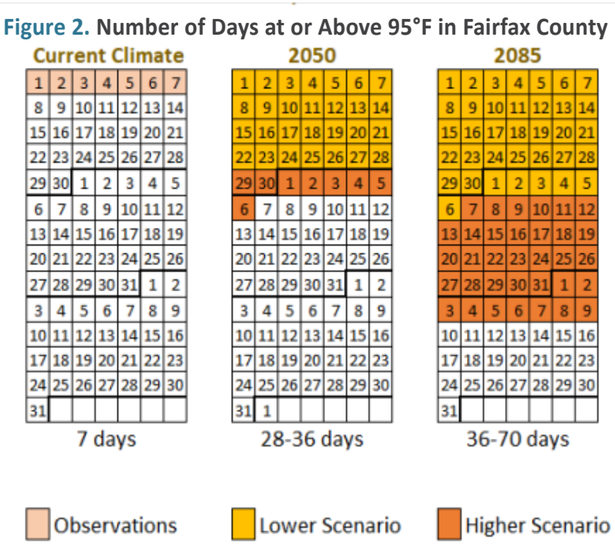
The intensity and frequency of extreme heat conditions in Fairfax County are increasing due to the impacts of climate change. Currently, the county experiences about seven days each year where the average temperature is at or above 95°F. This number is expected to increase substantially by the end of the century under both emissions scenarios.

Heat waves that were once considered rare and record-breaking are forecasted to become much more common. By 2050, longer durations of heat events and higher humidity during these hotter days will intensify the impacts felt by community members and make it harder for the county's most vulnerable populations to seek relief from the heat.

WHAT IS "EXTREME HEAT"?

Extreme heat definitions vary by region but are generally described as a period of high heat and humidity with temperatures above a certain threshold, like 95°F, for an extended period of time, such as two to three days. Figure 2 shows how extreme heat days are projected to increase by mid- and late-century.

Figure 2. Number of Days at or Above 95°F in Fairfax County



Number of days at or above 95°F under current climate conditions (averaged over 30-year period).

The number of days at or above 95°F is projected to **increase from 7 days** per year **to 28-36 days per year by 2050**. By 2085, Fairfax County may experience **up to 70 days** per year above 95 degrees.

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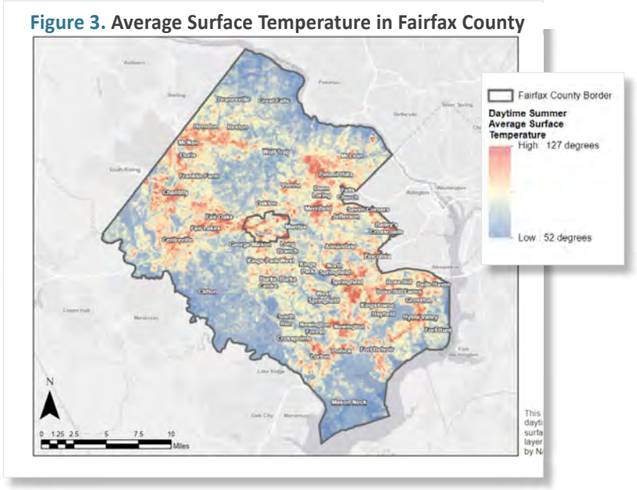
G. Climate Projections: Warmer, Wetter, Weirder (cont.)

URBAN HEAT ISLAND EFFECT IN FAIRFAX COUNTY

Projected increases in annual average temperatures and extreme heat conditions will be even further exacerbated in areas suffering from the Urban Heat Island (UHI) effect. The UHI effect is the phenomenon of heavily developed urban areas retaining more heat than their surroundings due to greater concentration of paved surfaces, fewer trees and green spaces, and more waste heat (e.g., car exhaust). For example, areas such as Annandale and Tysons Corner currently have land surface temperatures[1] over 120 degrees during hottest months, whereas our green spaces have land surface temperatures below 80 degrees.

Figure 3. Average Surface Temperature in Fairfax County



As temperatures rise, Urban Heat Islands in Fairfax County will face even hotter temperatures than other areas of the county.

Fairfax County partnered with NASA DEVELOP for detailed high-resolution Urban Heat Island data for the county. This data is based on several years of detailed land surface temperature satellite measurements. To see a map of Urban Heat Islands in the county, please click here. For more information, please see NASA DEVELOP's full report here.

Heat Vulnerability & Fairfax's Hottest Neighborhoods: Findings from NASA DEVELOP Project

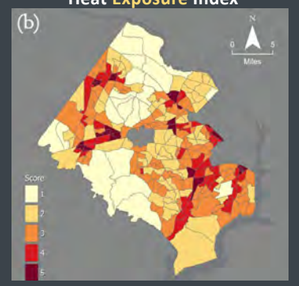
In 2021, NASA Develop conducted an Urban Heat Island assessment of the county. The results include a Heat Exposure Index, a Heat Sensitivity Index, and a Heat Vulnerability Index, among others including daily and nightly average surface temperatures in the summer, evapotranspiration, heat mitigation capacity (ability of an area to cool down), and distance to cooling centers, among others.

- Heat Exposure: what parts of the county are most exposed to heat?
- Heat Sensitivity: where do the most heat-sensitive residents live?
- Heat Vulnerability: what parts of the county are the most heat exposed and heat sensitive?

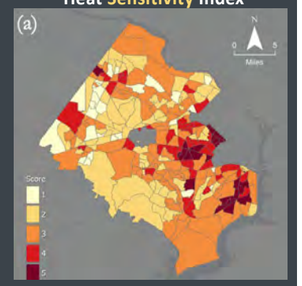
Urban heat islands in the county are particularly prevalent in areas such as Tysons, Annandale, Chantilly, Centreville, Springfield, and Herndon.

For more information, access the full NASA Develop report here.

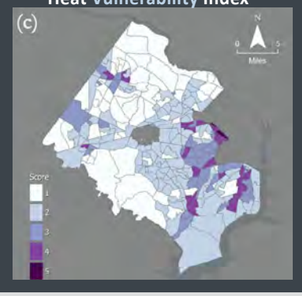
Heat Exposure Index



Heat Sensitivity Index



Heat Vulnerability Index

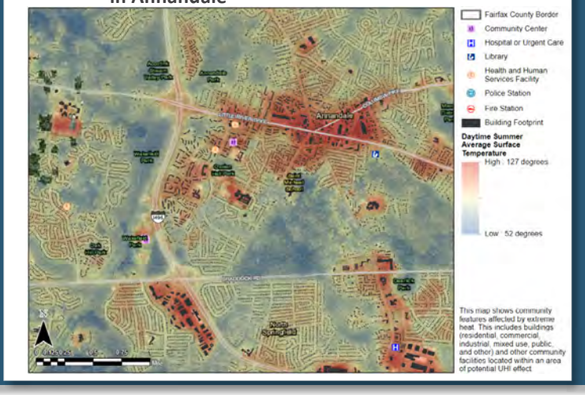


[1] It is important to note that these data refer to land surface temperature, and not air temperature.

COMMUNITY IMPACTS FROM EXTREME HEAT: ANNANDALE

The warming climate will exacerbate heat in already hot Urban Heat Islands, worsening health risks for those communities. The impact of extreme heat will be even greater on vulnerable (or "heat-sensitive") populations such as those with health conditions, disability, advanced age, inability to afford air conditioning, or outdoor occupations. If not immediately proximate, cooling centers, such as libraries and community centers, are difficult to access during periods of high heat.

Figure 4. Daytime Summer Average Surface Temperatures in Annandale



EXTREME COLD

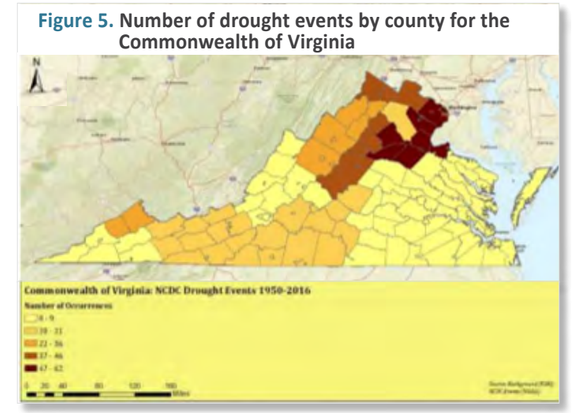
Consistent with the projected trend of warmer climate conditions in Fairfax County, warmer winters are projected. The number of days below freezing on average per year in Fairfax County is projected to decrease from 86 days (1991-2020 average) to 62-67 days by 2050. The number of freeze-thaw days per year is also projected to decrease.

Freeze-thaw days are days when the temperature crosses the freezing point (0°C/32°F).

DROUGHT

Drought refers to a prolonged period with drier than normal conditions and lack of precipitation. Fairfax County has historically experienced more significant drought events than other parts of the state.[2] From 1950 to 2016, the county recorded over 47 drought events (see Figure 5)[i] and the Virginia Department of Emergency Management identified Fairfax County at medium risk of drought.

Figure 5. Number of drought events by county for the Commonwealth of Virginia



As the climate changes, small-to-moderate decreases in drought conditions are forecasted for Fairfax County, because average precipitation is expected to increase by mid-century. However, when intermittent droughts do occur, they may be more severe than what the region has historically experienced.[ii] Given the considerable uncertainty in climate models regarding future drought conditions, the findings of the Climate Projection Report indicate that drought is considered a minor, but ongoing, risk for the county, and additional research is needed.

[2] Drought events here refers to federal disaster declarations for drought.

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G. Climate Projections: Warmer, Wetter, Weirder (cont.)

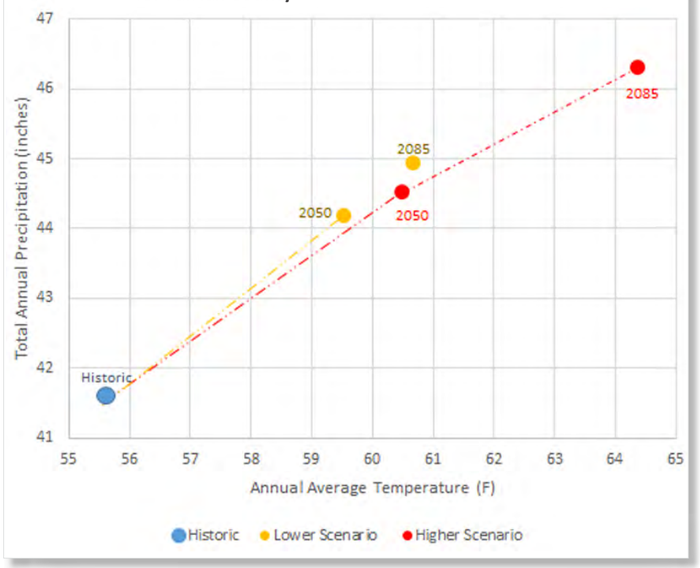
WETTER

PRECIPITATION

Precipitation in Fairfax County is projected to increase in both volume and intensity. The total annual amount of precipitation is projected to increase slightly, by approximately three inches by 2050 in a lower emissions scenario. However, this total volume of rain is projected to occur over fewer days, indicating that more rain will fall over a shorter period of time, resulting in heavier rain events.

Total annual precipitation has historically varied year-to-year; this trend will continue, with year-to-year precipitation becoming more variable and unpredictable. Additionally, given warmer conditions, more precipitation events are predicted to shift from snow to rainfall.

Figure 6. Projected Total Annual Precipitation (and Temperature) for Fairfax County



INLAND FLOODING

Given the projected increase in heavy precipitation days, inland flooding is also expected to increase. There are two major types of inland flooding:

- **Riverine flooding** which occurs when heavy or prolonged rains cause rivers and streams to overflow into floodplains.
- **Urban flooding**, which is more common in Fairfax County, occurs when rainwater overwhelms the county's stormwater drainage systems, particularly in low-lying or developed areas.

Figure 7 shows FEMA and county recorded floodplains in Fairfax County.

Figure 8 indicates varying degrees of flood exposure and risk across communities in Fairfax County.

Figure 7. Fairfax County's Recorded Floodplains

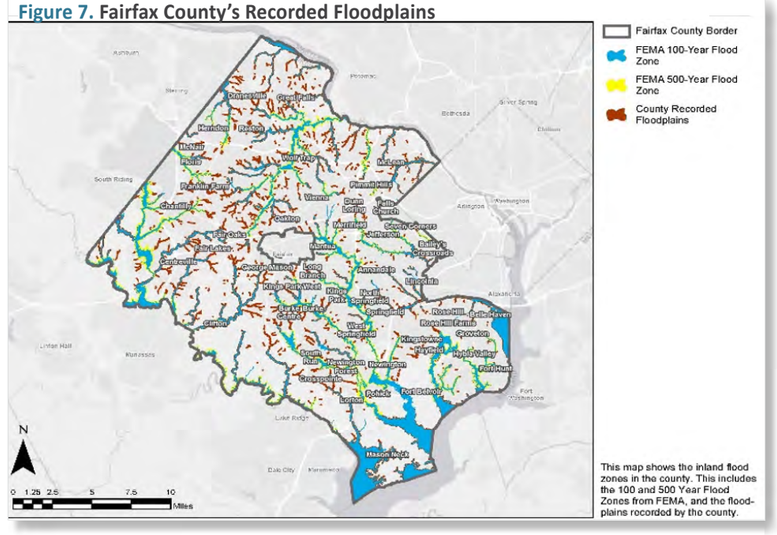
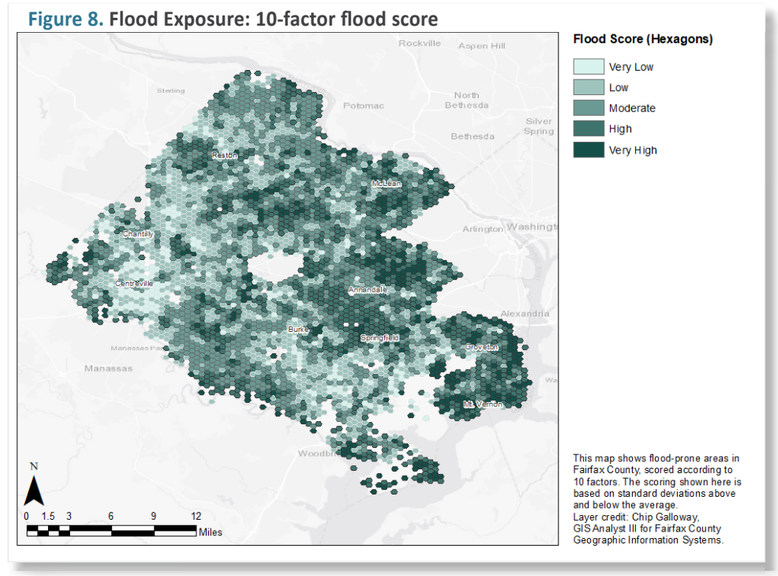


Figure 8. Flood Exposure: 10-factor flood score



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G. Climate Projections: Warmer, Wetter, Weirder (cont.)

COASTAL FLOODING

The county is also susceptible to "coastal flooding" impacts: flooding of the Potomac River and associated water bodies due to tidal flooding, sea level rise, coastal storm surge, or a combination of these. The southeastern portion of Fairfax County is most exposed to coastal flooding hazards.

Historically, sea level rise for the Fairfax County area has occurred at a rate of about 0.135 inches per year. The rate of sea level rise is projected to accelerate; by 2050, the county is projected to experience sea level rise of between 1.1 and 3.6 feet, depending on the GHG emissions scenario.[3]

Figure 10 illustrates potential flooded areas in the county under sea level rise projections of 1 to 3 feet.[4] The flooding occurs along the southeastern portion of the county and is largely an expansion of tidally influenced areas. The image also includes Category 1 and 2 coastal storm surge, which means water that is pushed ashore during severe weather events.

Figure 9. Projections of relative sea level rise for Washington DC tide gauge (8594900)

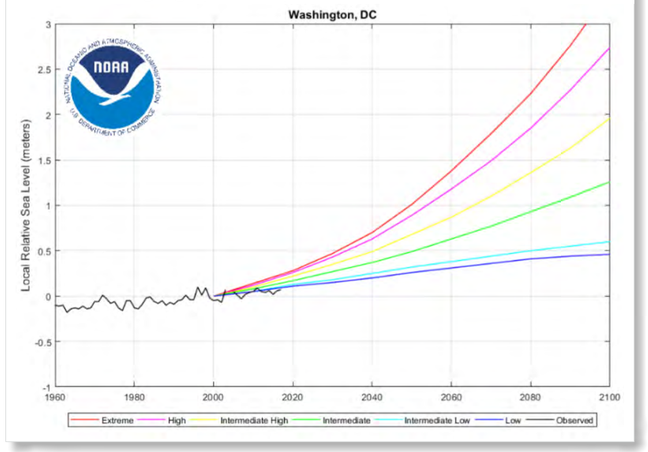
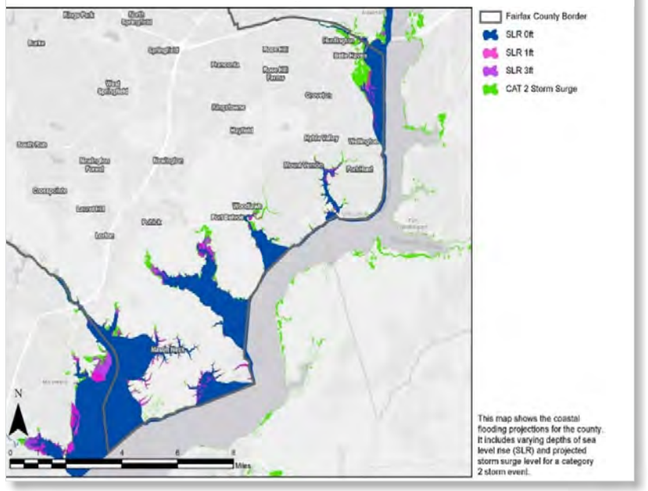


Figure 10. Coastal Flooding Exposure: Sea Level Rise and CAT 2 Storm Surge



[3] The Climate Projections Report used 2017 data from NOAA (Global and Regional Sea Level Rise Scenarios for the United States, 2017). Since completion of the report, NOAA has provided updated scenarios of the global and regional sea levels out to the year 2150 that have lower near-term, but consistent long-term sea level rise projections projections based on updated understanding of the Antarctic and Greenland ice sheet dynamics.

[4] One foot of sea level rise represents the projections for a low emissions scenario for 2050; three feet of sea level rise represents the projections for a high emissions scenario for 2050.

WEIRDER

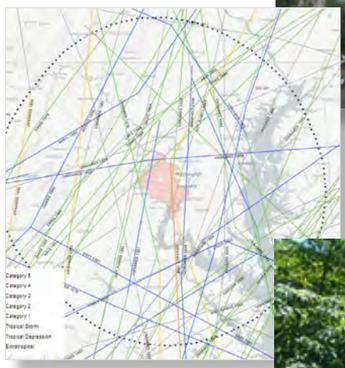
SEVERE STORM AND WIND EVENTS

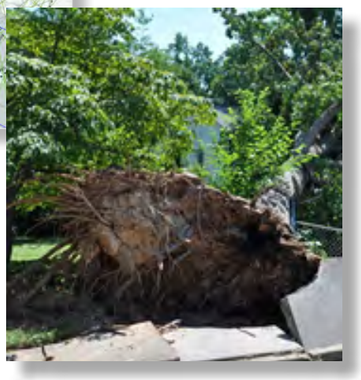
Each year, Fairfax County experiences a range of severe storm and wind events, including severe thunderstorms, tropical cyclones, and winter storms, among other storm types. Extreme weather events are becoming more frequent, fueled by warming temperatures. As temperatures warm, the air has an increased capacity to hold water vapor, leading to amplified conditions for storm events. There is varying confidence in how storm events may change under a warming climate, but a general consensus that intensity and frequency of extreme storms will continue increasing due to climate change.

From **1996** to **2021**, there were a total of **115 FEMA Major Disaster Declarations** including blizzards and winter storms (**6**), tropical cyclones (**5**), and severe storm with tornadoes, flooding and/or straight-line winds (**2**).

TROPICAL CYCLONES

Tropical cyclones include tropical depressions, tropical storms, and hurricanes. Fairfax County tends to experience the remnants of these storms or downgraded storms which can still cause significant rain, high winds, and flooding. While few tropical cycles have historically crossed the county directly, they can still have significant impact if their path tracks in the vicinity. Tropical cyclones intensities are projected to increase, including stronger wind



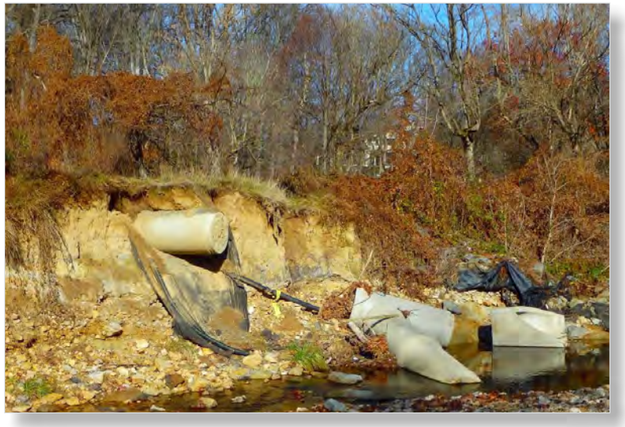


G. Climate Projections: Warmer, Wetter, Weirder (cont.)

conditions and heavier rains.

SEVERE THUNDERSTORMS

Severe thunderstorms can occur at any time of year in the county, causing hail, lightening, tornadoes, and strong winds. Derechos are widespread, long-lived, straight-line windstorms that are associated with severe thunderstorms that are particularly damaging. Severe thunderstorms can be associated with flash flooding, lightning, strong winds, hail, tornadoes, and wildfires. Climate change will increase the frequency of environmental conditions in which severe thunderstorms occur, increasing the likelihood of their occurrence.



WINTER STORMS

Winter storms in Fairfax County may range from moderate snow over a relatively short duration of a few hours to blizzard conditions lasting for several days. Significant damage in the form of downed power lines, fallen trees, power disruption, and hazardous travel conditions can occur. Warming conditions are projected to decrease the number of days per year below freezing in Fairfax County and reduce the total snow days per year, with more precipitation falling as rain.

This section has provided a brief summary of the Climate Projections Report. To read the full Climate Projections Report, please click this link.

Recent Fairfax County Hazard Events

- In May 2019, a severe line of thunderstorms produced high winds and damage in the county, leading to downed trees and siding and roofing shingles being pulled off of buildings
- In July 2019, thunderstorms produced intense rainfall that exceeded stormwater infrastructure capacity and caused severe flooding, requiring swift water rescues.
- In April 2021, cold fronts sparked severe weather that knocked down trees, caused damage to buildings, and blocked roads.

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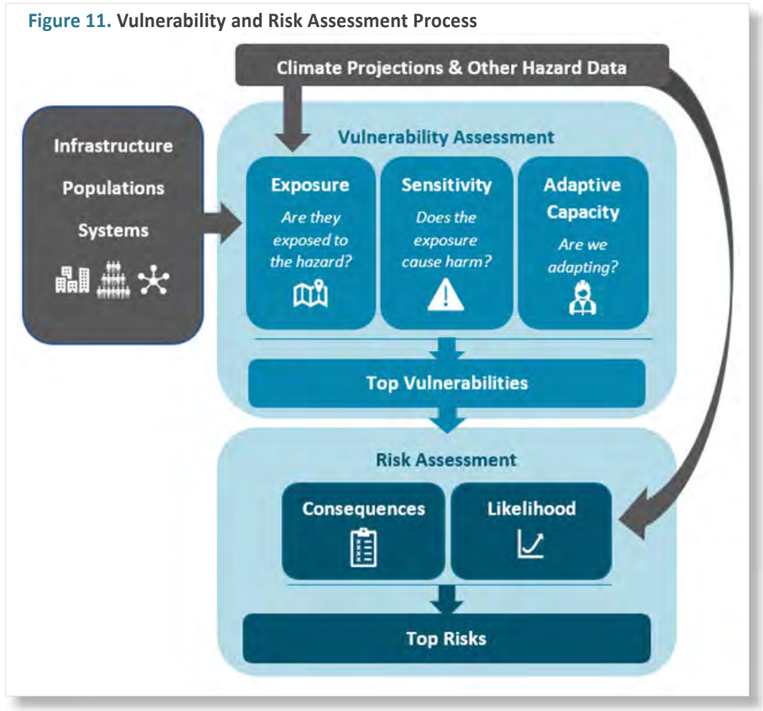
H. Vulnerabilities and Risks

Fairfax County has already experienced rising temperatures, more frequent heat waves, stronger storms, heavier rainfall events, and rising sea levels, as described in the Climate Projections section above. These climatic conditions can impact our populations, buildings, infrastructure, and vital community services. When we understand these impacts, we are better able to build in resilience to future conditions. Therefore, the second step of the Resilient Fairfax planning process was a climate Vulnerability and Risk Assessment (VRA).

The purpose of the **Vulnerability and Risk Assessment (VRA)** is to identify the county's top vulnerabilities and risks associated with climate change. The VRA answers the question, "Given these projections, where are we vulnerable?"[5]

The **Vulnerability Assessment** identifies which Fairfax County assets, systems, and populations are *most exposed, most sensitive, and least adaptive* to the projected climate hazards. This assessment was used to help identify the county's "top vulnerabilities." The **Risk Assessment** analyses the top vulnerabilities to determine which of these is most likely and most severe in consequence. For more information, access the full technical report here.

Figure 11. Vulnerability and Risk Assessment Process



VULNERABILITY AND RISK ASSESSMENT METHODOLOGY

The VRA Report contains two distinct assessments: a Vulnerability Assessment and a Risk Assessment. The scoring approach used in the Vulnerability Assessment was adapted from methodology developed by the Association of Climate Change Officers (ACCO). The Risk Assessment then provides a qualitative analysis of the top vulnerabilities identified in the Vulnerability Assessment.

[5] The Resilient Fairfax VRA is similar to the Hazard Mitigation Plan process, with a couple of key differences. The VRA focuses on climatic conditions only. The VRA also focuses on long-term and future change in conditions.

Vulnerability and Risk Assessment Sectors

Based on best available science, the sectors and subsectors were evaluated for their vulnerability to six climate hazards of concern: extreme heat, heavy precipitation and inland flooding, severe storms, extreme cold, coastal flooding, and drought (see Table 1).

Table 1. Vulnerability and Risk Assessment Sector

Sector	Subsector
Populations	General Population and Socioeconomically Vulnerable Populations
Public Services	Health and Community Services, Emergency Response and Management Services, Parks and Recreational Services, Waste Management Services
Buildings	Residential, Commercial, Industrial, Mixed-Use, Parking Garages, Public Buildings, and Other Buildings
Water Infrastructure	Drinking Water, Stormwater, and Wastewater Infrastructure
Energy and Telecommunications Infrastructure	Electricity, Natural Gas, Telecommunications
Transportation Infrastructure	Roadways and Bridges, Rail and Public Transit, Bicycle and Pedestrian Infrastructure
Natural and Cultural Resources	Water Bodies, Wetlands and Environmentally Sensitive Areas, Trees and Forests, Agricultural and Farm Areas, Cultural and Historic Resources

Vulnerability and Risk Assessment Scoring

The Vulnerability Assessment evaluates the exposure, sensitivity, and adaptive capacity of Fairfax County assets, systems, and populations. The purpose is to identify which are most vulnerable to the projected climate hazards.

Vulnerability = Exposure x Sensitivity x Adaptive Capacity

The results of the Vulnerability Assessment highlight which sectors and subsectors are most vulnerable to a changing climate and provide a generalized understanding of current and future threats to the county.

The Risk Assessment evaluates the top vulnerabilities, to consider which vulnerabilities are most likely, and which could present the most severe consequences.

Exposure measures whether an asset, system, or population may be exposed to a climate hazard.

Sensitivity measures how sensitive an asset, system, or population is to the climate hazard.

Adaptive Capacity measures capacity to enhance resilience and adapt to these hazards.

Risk = Likelihood of Occurrence x Consequence

Vulnerability and Risk Assessment Key Finding and Outcomes

The VRA helped the county identify our top vulnerabilities to climate change. These top vulnerabilities are summarized in the table below. For more detail, please see the full VRA here.

Heavy Precipitation Causing Inland Flooding of Communities

Sectors Most Impacted: Vulnerable populations, general population, buildings, cultural and historic, and roadways, agriculture, electricity, emergency response, health and community services, parks and rec, public transit, stormwater management infrastructure, tree canopy, wastewater infrastructure, and water bodies

Combined Stress on Natural Systems

Systems Most Impacted: Water bodies, wetlands and environmental sensitive areas, trees and forested areas, parks and recreation areas, and agricultural districts and farms

Severe Storms and Wind Causing Vulnerabilities Due to Debris, Damage, and Unsafe Storm Conditions

Sectors Most Impacted: Emergency response, buildings, health and community services, roadways, tree canopy, vulnerable populations, bicycle and pedestrian, cultural and historic, general population, parks and recreation, public transit, and telecommunications

Severe Storms and Wind Causing Vulnerabilities due to Power Outages

Sectors Most Impacted: Electrical infrastructure, general population, vulnerable populations, drinking water, emergency response, buildings, public transit, telecommunications, and health and community services

Extreme Heat Causing Health Related Impacts

Sectors Most Impacted: Vulnerable populations, general population, emergency response and management services, public transit, bike and pedestrian, parks and recreation areas, waste management (health related hazards), and health and community services

Coastal Flooding (Potomac River) Impacts

Sectors Most Impacted: Buildings, vulnerable populations, general populations, water bodies, wetlands, and environmental sensitive areas

CONSIDERATION FOR VULNERABLE POPULATIONS

One of the most important pieces of a climate vulnerability and risk assessment is the analysis of populations who may be disproportionately exposed and/or sensitive to specific climate hazards, or who may lack the capacity to adapt to changing conditions. Identification of these impacts helps the county plan for potential strategies to assist these communities.

Some populations may be more vulnerable due to systemic inequities and historic underinvestment in their neighborhoods and the infrastructure they use. For example, someone who lives in a neighborhood with degrading or inadequate infrastructure and frequent power outages may be more vulnerable to flooding and storms than someone who lives in a neighborhood that was provided with new infrastructure that meets today's design standards. Others may be more vulnerable due to personal factors, including health conditions and disabilities, that make them more sensitive to effects such as extreme heat or severe storms that require evacuation. Some may lack the financial or logistical capacity to implement expensive adaptation measures, such as elevating or flood-proofing their homes. Addressing the needs of the county's disproportionately burdened populations is a priority for the county.

The Resilient Fairfax VRA used the One Fairfax Policy and One Fairfax population vulnerability data as a foundation for the population assessments. This data was supplemented with on-the-ground insights directly from the community and from partners who work regularly with vulnerable residents.

This section has provided a brief summary of the Vulnerability and Risk Assessment. For more information, please see the full Vulnerability and Risk Assessment.

INCLUSION OF EQUITY IN DECISION-MAKING

The One Fairfax Policy establishes the consideration of equity in county decision making and planning. Resilient Fairfax actively seeks to promote racial equity and social justice by evaluating disproportionate climate burdens and planning for equitable implementation of resiliency strategies.

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I. Audit of Existing Policies, Plans and Programs

AUDIT PURPOSE AND OVERVIEW

To support and inform the Resilient Fairfax plan, the county team completed an Audit of Existing Policies, Plans, and Programs ("Audit"). The Audit sought to understand the extent to which Fairfax County has already incorporated climate change resilience into planning, programming, and policy, and where updates are needed. The good news is that Fairfax County has numerous initiatives and policies already in place to address the impacts of climate change. However, there are opportunities for improvement. The Audit helped the county identify those opportunities. **This assessment identified:**

1. Where Fairfax has already begun to implement best practices for increasing resiliency,
2. Opportunities to expand, extend, or accelerate existing initiatives, and
3. Gaps where new strategies or policy updates may be needed to address climate resiliency needs.

When partnered with the VRA, the Audit provided a strong foundation for the strategy identification phase of the planning process. The Audit process helped the county select and develop strategies that build upon Fairfax County's existing initiatives and address key policy gaps.

AUDIT STRUCTURE

The Audit is composed of a series of adaptation and resilience-focused questions. These questions are organized into the following sectors, which align with the sectors in the VRA

- Population
- Governance
- Interdisciplinary/Other
- Buildings and Sites
- Water Infrastructure
- Energy
- Transportation
- Natural and Cultural Resources
- Buildings

For each question, the report provides the following: the relevance of the question to climate resilience, a qualitative score to summarize how the county is doing on that item, a description of findings, opportunities for improvement, and a list of key supporting resources that were used to answer the question.

AUDIT METHODOLOGY

The Audit was completed by a consultant team, with significant coordination and feedback from 20 county departments and dozens of external advisors on the Infrastructure Advisory Group and Community Advisory Group. A thorough literature review of over 150 county policies, plans, and programs was completed. This literature review was supplemented and refined based on primary information from county departments and other agencies with extensive firsthand experience. The consultant team then provided independent qualitative "scores" and opportunities for improvement to help the county identify areas of focus in the strategy development stage.

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I. Audit of Existing Policies, Plans and Programs (cont.)

AUDIT KEY FINDINGS

What is working well? Where are there opportunities for new programs, policies, or actions?

The Audit found that Fairfax County is active and engaged across all sectors relevant to climate resilience, but there are opportunities for further strengthening the county's policies, plans, and programs. Fairfax County has numerous areas of strength and important fundamental policies and programs upon which to build. The Audit identified more than 100 potential opportunities for the county to consider as it builds out the Resilient Fairfax program. Findings for each sector are summarized in Table 2. When partnered with the other technical reports, these opportunities and gaps helped inform the development of the county's climate adaptation and resilience strategies, which are summarized in Section K.

Table 2. Summary of Audit Key Findings

Key Strengths	Resilience Opportunities	Strategy
Population		
Fairfax County is strong in its provision of resources to vulnerable populations before, during, after, and unrelated to extreme weather. There is significant work underway to implement the One Fairfax Policy to consider equity in decision-making.	The work to identify, invest in, and engage vulnerable communities is done in a fragmented and not yet systematic approach across different departments. There is the opportunity to build on the One Fairfax Policy and integrate with Resilient Fairfax to ensure more inclusive processes and more equitable outcomes for vulnerable communities.	IAP.2a CRC.1a CRC.2a CRC.2b
Governance		
The county has commitments in support of climate action, dedicated funding and staff for climate planning, collaboration with regional partners, and the ability to conduct cross-sector, interdepartmental collaboration through the Office of Environmental and Energy Coordination.	There is opportunity for the county to strengthen its coordination with local non-profit and other partners on climate action initiatives. There is the opportunity for the county to develop standards for including climate change impacts in the Capital Improvement Program process.	IAP.4a RIB.1a
Interdisciplinary / Other		
Interdisciplinary efforts identified as areas of strength for the county include the robust GIS and Mapping Service Program that provide the community access to a plethora of GIS maps and data as well as the inclusion of climate hazards in the hazard mitigation and emergency response plans.	Interdisciplinary efforts require extensive collaboration and coordination to integrate climate action across departments including emergency management, public health and human services, GIS/data services, and economic development. Areas of opportunity identified include further integration of climate projections into county process and planning, integration of climate resilience workforce needs into economic development and job training, and completion of a climate and health plan.	IAP.2a IAP.4a
Buildings		
Fairfax County has strong site development guidelines, with thorough requirements for floodplain and stormwater management. The county's government buildings are required to meet Green Building Standards and private development are encouraged to do the same.	While the county does not control the Virginia Building Code, there is an opportunity for the county to advocate for stronger codes and standards at the state level. There is an opportunity for expanded education to building owners, developers, and designers and for the county to lead by example through implementation of resilience measures for county-owned buildings and critical facilities.	RIB.1b RIB.2b CRC.2b
Water Infrastructure		
Fairfax Water oversees drinking water infrastructure and has taken steps to increase resilience of these assets. Wastewater and stormwater infrastructure are areas of strength for Fairfax County, with robust efforts underway to improve resilience, such as consideration of climate impacts for the Wastewater Management Program and a comprehensive flood mitigation program.	There is the opportunity to more systematically integrate climate projections into stormwater and floodplain modeling and watershed management plans. Considering current and future climate conditions in development of a long-term neighborhood stormwater improvement program to address flooding and infrastructure reinvestment would build resilience.	RIB.1a RIB.1b CRC.3a
Energy		
Fairfax County has limited ability to directly address energy infrastructure; however, the county has completed significant work to assess back-up power to critical facilities and complete infrastructure upgrades for vulnerable components.	There are opportunities to advance energy resilience through increasing energy efficiency, energy diversity, and deployment of energy storage. Additional opportunities include feasibility assessments of solar-plus-storage projects on county property.	RIB.1c RIB.2a
Transportation		
Transportation partners at the state level have made notable strides in considering climate projections and vulnerabilities in infrastructure planning and design.	There are opportunities to further integrate climate projections into transportation design and for Fairfax to improve collaboration with other agencies who plan and maintain transportation infrastructure.	IAP.4a RIB.2c
Natural and Cultural Resources		
Fairfax County has a strong history of natural resource conservation, particularly related to water quality. There are numerous policies and programs in place that support protection of the natural environment, including comprehensive regulations for Resource Protection Areas and for floodplains. The county also has numerous initiatives, pilots, and policies related to green infrastructure and nature-based solutions, such as living shorelines.	There is an opportunity for Fairfax County to develop a consolidated natural resource management plan in which natural resources are more systematically considered to be a managed asset for climate resilience. There are opportunities to further support green infrastructure implementation in the county, through guidance documents, technical support, educational programs, and updated monitoring and maintenance standards.	AE.1a AE.1b AE.2a

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J. Resilient Fairfax Strategies and Implementation

What can Fairfax County do to become more resilient to climate hazards and vulnerabilities?

This section of the plan summarizes our strategies and plans for implementation. Resilient Fairfax strategies are organized into four key pillars that, together, build the vision of a resilient Fairfax County. The pillars are:

IAP	Integrated Action Planning	Integration of climate considerations in planning and coordination ensures resiliency is at the forefront across county initiatives.
CRC	Climate Ready Communities	A well-connected and prepared community is better able to respond to and recover from climate hazards.
AE	Adaptive Environments	Natural environments that are protected and restored improve the county's overall resilience to climate impacts.
RIB	Resilient Infrastructure and Buildings	Infrastructure and buildings that can withstand climate impacts, keep residents safe, and reduce service disruptions enhances countywide resilience.

Each pillar of Resilient Fairfax contains a set of goals, strategies, and implementation actions. Because resiliency requires coordination at all levels, the strategies include a diverse range of action types, time frames, scales, and costs.

They include near-term, long-term, and ongoing programs. Some strategies address countywide policies or plans, while others focus specifically on prioritizing the needs of vulnerable communities. Some strategies focus on physical infrastructure upgrades while others focus on policy development or protection of natural resources. As climate change brings impacts across a range of sectors and geographies, our response must be similar; resiliency requires interdisciplinary engagement between county departments, neighboring jurisdictions, partner agencies, community organizations, and community members.

The strategies were identified through a thorough process of analysis and engagement. (See Section L for more detail). An initial list of strategies was created from the results of the Climate Projections Report, Vulnerability and Risk Assessment, the Audit of Existing Policies, Plans and Programs, and a database of best practices. Throughout plan development, collaborative workshops and stakeholder engagement helped to refine and prioritize these strategies.

It is easier to act on strategies when there is a plan for implementation. Therefore, the prioritized strategies have been built out in the "Implementation Roadmaps." The Implementation Roadmaps contain information needed to bring each prioritized strategy to fruition, including leads and partners, cost estimates, action steps, key performance indicators, equity considerations, and more.

To keep track of the other strong strategy suggestions identified throughout Resilient Fairfax plan development process, a list of "Additional Strategies" is also included for each goal. These Additional Strategies are included to ensure the intent and value of these strategies are carried forward and can be built upon in the future.

SNAPSHOT OF RESILIENT FAIRFAX STRATEGIES

Vision	Integrated Action Planning				Climate Ready Communities			Resilient Infrastructure and Buildings		Adaptive Environments	
Goals (Abbrev.)	IAP.1. Climate in Countywide General Planning	IAP.2. Data Collection for Resilience	IAP.3. Funding Plan	IAP.4. Agency Collaboration	CRC.1. Safe & Resilient Spaces	CRC.2. Community Capacity	CRC.3. Climate Ready Development	RIB.1. Resilient County Government Buildings and Infrastructure	RIB.2. Advocacy for External Resilient Infrastructure Action	AE.1. Protection of Natural Resources	AE.2. Restoration of Natural Resources
Priority Strategies (Bold) & Additional Strategies (Non-Bold)	**IAP.1a. Pursue Updates to the Comprehensive Plan to Enhance Resilience**	**IAP.2a. Develop Resilience Metrics and a Tracking System for Ongoing Assessment of Community Resilience and Improvements**	**IAP.3a. Develop a County Climate Fund**	**IAP.4a. Establish a Long-Term Interagency Collaboration System**	**CRC.1a. Pursue Development of a Network of Resilience Hubs in Climate-Vulnerable Areas Of The County**	**CRC.2a. Provide Community Aid and Engagement to Alleviate Resilience Needs**	**CRC.3a. Pursue and Implement a Flood-Risk Reduction Plan for The Fairfax County Community**	**RIB.1a. Update Capital Improvement Program Process to Include Climate Resilience Considerations**	**RIB.2a. Advocate and Partner for Energy Resilience**	**AE.1a. Develop a Consolidated Natural Resources Management Plan**	**AE.2a. Pursue Green Infrastructure Projects That Provide Climate Resilience Benefits**
	IAP.1b. Update Strategic Plan to Enhance Climate Resilience	IAP.2b. Support Climate Research and Data Collection	**IAP.3b. Pursue Federal and State Funding Opportunities**	IAP.4b. Build County Staff Capacity to Lead on Climate Resilience Planning and Implementation	**CRC.1b. Develop Adaptation Action Areas Where Resilience Action is Prioritized**	**CRC.2b. Launch a Climate Resilience Education Program**	**CRC.3b. Propose County Incentive and Assistance Programs That Reduce Heat-Related Climate Risk**	**RIB.1b. Enhance Flood Resilience of County Buildings and Other Facilities**	RIB.2b. Advocate for Resilience Updates to the Building Code	**AE.1b. Pursue Partnerships and Financing to Conserve And Protect Environmentally Sensitive Areas**	AE.2b. Support Continued Stream Corridor Restoration
	IAP.1c. Complete Climate Health Plan	IAP.2c. Create Consolidated Database of Flood-Prone Areas	IAP.3c. Identify Funding for Long-Term Data Collection		CRC.1c. Expand Targeted Tree Plantings	CRC.2c. Support Resilience Related Workforce Development	**CRC.3c. Pursue Amendments to Zoning Ordinance and other County Code Chapters to Enhance Resilience**	RIB.1c. Enhance Energy Resilience for County Buildings and Facilities	RIB.2c. Advocate and Partner with Transportation Agencies to Support Transportation Resilience	AE.1c. Update Requirements for Conservations Easements	AE.2c. Support Urban Reforestation
	IAP.1d. Coordinate Hazard Mitigation and Emergency Management Planning with Climate Resilience Planning	IAP.2d. Continue to Collect Rainfall Data	IAP.3d. Identify Additional Funding Opportunities		CRC.1d. Enhance C-PACE Program Outreach and Technical Assistance	CRC.2d. Expand Warning System.	CRC.3d. Update the Public Facilities Manual	RIB.1d. Enhance Heat Resilience for County Buildings and Facilities		AE.1d. Integrate Climate Change Considerations into Urban Forestry Program	AE.2d. Explore Living Shoreline Opportunities
		IAP.2e. Create Database to Track Hazard Mitigation Action						RIB.1e. Update A/E Procurement			AE.2e. Restore Wetlands and Floodplains
		IAP.2f. Continue to Collect Tree Canopy Data						RIB.5f. Climate Projections in WW planning			AE.11f. Explore Regenerative Agriculture Opportunities
		IAP.2g. Continue to Collect Lidar Data									
		IAP.2h Collect Climate Change and Vector-Borne Disease Data									

4 PILLARS, 11 GOALS, 18 PRIORITY STRATEGIES

Advocacy and Partnerships

Virginia is "Dillon Rule" state. This means that local governments like Fairfax County have limited authority to make updates to policies and codes unless action is taken at the state level. For example, the county does not have direct control over the Building Code, which is set at the state level. Fairfax County government also does not have direct jurisdiction over many aspects of energy, transportation, and water infrastructure in the county, as they are managed by entities such as Dominion Energy, Washington Gas, VDOT, WMATA, and Fairfax Water. However, where the county does not have direct jurisdiction, there are opportunities for advocacy and partnership with infrastructure managers to advance resilience initiatives in these sectors.

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How to Read an Implementation Roadmap

CLIMATE HAZARDS ADDRESSED:
Identifies which climate hazards are relevant to the strategy.

LEAD:
County department(s) that will lead and coordinate the completion of the Implementation Actions.

PARTNERS:
Other county departments or key coordinating public agencies that will have a supportive role in completion of the Implementation Actions.

TIMELINE:
Estimated timeline need to conduct planning and coordination of the Implementation Actions. Timeline is estimated timeframe for completion of the Implementation Actions for each strategy, not the start of implementation.

COST:
Estimated scale of investment needed to complete the Implementation Actions. Cost is reflective of planning and coordination needs and does not include construction costs.

STRATEGY DESCRIPTION:
Description of the strategy, including context for how it connects to existing county plans, policies, or programs, how the strategy addresses climate risk, and/or how the strategy improves Fairfax's resilience.

IMPLEMENTATION ACTIONS:
Clear, measurable steps to achieve the strategy objective. Implementation Actions can be, but are not necessarily, sequential.

KEY PERFORMANCE INDICATORS:
Key metrics that help to measure progress, monitor implementation, and inform decision making.

EQUITABLE IMPLEMENTATION:
Recommendations for how to implement the strategy more equitably, with considerations for needs of vulnerable and historically disadvantaged populations.

FUNDING OPPORTUNITIES:
Identifies applicable funding sources that could assist with strategy implementation.

CO-BENEFITS:
Highlights additional benefits provided by strategy implementation, beyond climate risk mitigation, that improve overall resilience of Fairfax.

Goal AE.2 — Restoration: Restore Damaged Areas Through Nature-Based and Natural Solutions

STRATEGY AE.2a — Pursue Green Infrastructure Projects That Provide Climate Resilience Benefits.

Strategy Description: "Green infrastructure" refers to systems that use a combination of ecologically-based and engineered solutions to support heat mitigation, water quality, stormwater management, and numerous other co-benefits. Green infrastructure can include a range of systems from structural projects, such as bioretention ponds, bioswales, permeable pavements, and green roofs, to non-structural green infrastructures, such as land conservation, floodable parks, and green spaces. This strategy focuses primarily on structural green infrastructure projects. Strategic location and implementation of green infrastructure projects can support the county's broader flood mitigation efforts through localized retention of stormwater, as well as providing localized cooling and other community benefits. While Fairfax County does not have a formal green infrastructure plan, the county has numerous initiatives, pilots, and policies that relate to the goals of green infrastructure. This strategy would expand upon existing efforts to support implementation of green infrastructure for resilience benefits.

Climate Hazards Addressed:

Lead:	FCDOT, DPWES, NVSWCD
Partners:	DCC, DPD, FCPA, FCPS, LDS, OEEC, UFMD
Timeline:	Medium-Term (2-5 years)
Cost:	$$$ ($500k - 1 million)

Implementation Actions:

i.	Identify areas that are: heat vulnerable, flood-prone, and/or areas where green infrastructure would provide additional community and resilience benefits.
ii.	Integrate structural green infrastructure projects into county CIP process and support prioritization of green infrastructure projects in identified areas. Prioritize native plants when feasible and effective.
iii.	Explore policies to support green infrastructure implementation, including but not limited to: incentive programs, de-paving neighborhood targets, and stormwater service fee credits.
iv.	Develop and promote guidance for small-scale green infrastructure projects, such as tree plantings or rain gardens, that can be implemented on-site by local businesses, Commercial and Industrial properties, and homeowners to support heat mitigation, local retention of stormwater, and other resilience benefits. Promote and expand awareness of existing green infrastructure programs, workshops, and assistance provided by NVSWCD.
v.	Support community greening programs to encourage reduction of impervious spaces and expansion of green spaces in communities, prioritizing native plants when feasible and effective. Develop maintenance programs for green spaces. Engage with community groups, volunteers, and students.

Key Performance Indicators:
Outcome: Establish new policy/incentive for private development implementation of green infrastructure

- *Completion of green infrastructure guidance document.*
- *Number (#) of new small-scale green infrastructure (private development, by type)*
- *Number (#) of CIP projects with green infrastructure component (public projects, by type)*
- *Number (#) of tree plantings (by location, e.g., street trees, urban forest, open space)*

Equitable Implementation:

Equity Considerations:
- ✓ Consider how these green infrastructure projects affect surrounding neighborhoods and how residents, particularly low-income, can benefit from the incentive program and meaningfully participate in community greening projects.

How to Equitably Implement:
- ✓ Include a maintenance program for green infrastructure installations to ensure proper drainage and that the amenity does not attract/collect litter or dumping, which can affect the values of surrounding properties.
- ✓ Teach the community about the benefits of green infrastructure and provide tools necessary to participate at an individual level.
- ✓ Include a community education component to involve stewards that can address continued use of green infrastructure installations.
- ✓ Incorporate community input to decide the locations of the green infrastructure projects.
- ✓ Set up programs that subsidize measures to alleviate flood risks following heavy rainfall. Incorporate an educational component and localized participation in rain capture practices (rain barrels, downspout planters, etc.).
- ✓ Add stormwater service fee credit potential to promote potential savings using the program.

Funding Opportunities:
- *BRIC*
- *HMGP*
- *Flood Mitigation Assistance Grant*
- *Virginia Community Flood Preparedness Fund*
- *Healthy Streets Program*

Co-Benefits:

ADDITIONAL STRATEGIES:
Other key adaptation and resilience strategies identified throughout the strategy development phase. Because strategy prioritization was necessary, the "Additional Strategies" are not fleshed out with detailed Implementation Roadmaps. However, these Additional Strategies are also critical to resilience, top of mind for staff, and important to include in the plan. Therefore, the "Additional Strategies" are incorporated in the plan in a simplified form. In some instances, the Additional Strategies were not selected for Implementation Roadmaps because work is already well underway through another initiative, or they are already regularly addressed through county work programs.

ADDITIONAL STRATEGIES FOR GOAL AE.2

Strategy AE.2b	**Support Continued Stream Corridor Restoration** Continue and expand the county's stream corridor restoration opportunities, leveraging best available science and best practices in habitat restoration.
Strategy AE.2c	**Support Continued Urban Reforestation** Aid with urban heat island effect and flooding impacts through urban reforestation projects, expanding upon existing initiatives by the Urban Forestry Management Division.
Strategy AE.2d	**Explore Living Shoreline Opportunities** Aid in coastal flooding risks through living shorelines projects. Pursue potential development of a Shoreline Management Plan, as a component of the Consolidated Natural Resources Management Plan. Leverage existing living shorelines pilot projects for educational purposes.
Strategy AE.2e	**Restore Wetlands and Floodplains** Aid in flooding risk through wetland and floodplain restoration.

CLIMATE HAZARDS KEY

Extreme Heat | *Extreme Cold* | *Inland Flood* | *Coastal Flood* | *Drought* | *Storm*

CO-BENEFITS KEY

Public Health | *Social Equity* | *Economic Benefits* | *GHG Reductions* | *Community Capacity Building* | *Natural Resource Protection*

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Integrated Action Planning Implementation Roadmaps

Pillar 1: Integrated Action Planning (IAP):

The Integrated Action Planning pillar builds climate change considerations into planning, data collection, funding, and interagency collaboration to establish a system for continuous resiliency success. This pillar provides a strong foundation for the other pillars. It supports resilience collaboration that is multidisciplinary, well-coordinated, data-based, iterative, inclusive, and transparent. Strategies in the "Integrated Action Planning" pillar support the county in aligning plans and policies, making informed decisions, conducting metric-based monitoring and evaluation, obtaining needed funding, and working collaboratively across county departments and agencies for the long-term.

Integrated Action Planning includes:

- Amending county-wide plans such as the Comprehensive Plan and the Strategic Plan to enhance resiliency
- Monitoring and evaluating progress, supporting transparency, and informing implementation
- Positioning county to be competitive for state and federal funding opportunities
- Building new funding streams and providing dedicated funding source to support county's climate goals
- Establishing long-term continued interdepartmental resiliency collaboration and capacity

IAP — Integrated Action Planning Strategies:

Goal IAP.1: General Planning	Goal IAP.2: Data Collection	Goal IAP.3: Funding Plan	Goal IAP.4: Agency Collaboration
IAP.1a: Pursue Updates to the Comprehensive Plan to Enhance Resilience	IAP.2a: Develop Resilience Metrics and A Tracking System for Ongoing Assessment of Community Resilience and Improvements	IAP.3a: Develop a County Climate Fund IAP3b: Pursue Federal and State Funding Opportunities.	IAP.4a: Establish Long Term Interagency Collaboration System
Additional Strategies: ▪ IAP.1b: Update Strategic Plan to Enhance Climate Resilience ▪ IAP.1c: Complete Climate Health Plan ▪ IAP.1d: Coordinate Hazard Mitigation & Emergency Management Planning with Climate Resilience Planning	*Additional Strategies:* ▪ IAP.2b: Support Climate Research and Data Collection ▪ IAP.2c: Create Consolidated Database of Flood-Prone Areas ▪ IAP.2d: Continue to Collect Rainfall Data ▪ IAP.2e: Create Database to Track Hazard Mitigation Action ▪ IAP.2f: Continue to Collect Tree Canopy Data ▪ IAP.2g:Continue to Collect Lidar Data	*Additional Strategies:* ▪ IAP.3c: Identify Funding for Long-Term Data Collection ▪ IAP.3d: Identify Additional Funding Opportunities	*Additional Strategies:* ▪ IAP.4b: Build County Staff Capacity to Lead on Climate Resilience Planning and Implementation

Goal IAP.1 — General Planning: Integrate Climate Resiliency into Countywide General Planning

STRATEGY IAP.1a — Pursue Updates to the Comprehensive Plan to Enhance Resilience.

Strategy Description: The Fairfax County Comprehensive Plan, as required by state law, serves as a guide for decision-making about the natural and built environment. The Policy Plan includes general countywide policy on land use, transportation, housing, the environment, heritage resources, economic development, and public facilities, including public parks, recreation, and trails. The Comprehensive Plan is relevant to climate resilience because it provides a long-term vision for the county and includes numerous sectors that serve as pieces of the resilience puzzle. The Comprehensive Plan has potential to guide resilience for both private development and public facilities in addition to natural areas. This strategy includes analysis, recommendation formation, and potential updates to Comprehensive Plan elements pertaining to climate resilience. This strategy will build upon work completed through the Resilient Fairfax Audit process. Potential updates could pertain to critical public service facilities, land use patterns, floodplains, wetlands and shorelines, and urban heat islands, among others. All amendment processes require Board of Supervisors authorization. Comprehensive Plan amendments relating to resilience should be coordinated with other Comprehensive Plan amendments, such as those associated with CECAP. Completion of this strategy will align long-term planning with Resilient Fairfax and the county's climate resilience goals.

Climate Hazards Addressed:

Lead:	OEEC, DPD
Partners:	DEMS, DOT, DPWES, EDA, FCPA, HD, LDS, NCS
Timeline:	Long-term (5-8 years)
Cost:	$ ($0 - 100k)

Office of Environmental and Energy Coordination: The Office of Environmental and Energy Coordination (OEEC) is responsible for cross-organizational development and implementation of effective environmental and energy policies, goals, programs and projects, and engaging county departments, authorities, businesses, and residents to advance environmental and energy priorities. OEEC reports directly to the Office of the County Executive and leads many sustainability initiatives, including Resilient Fairfax, CECAP, and HomeWise.

Implementation Actions:

i.	OEEC, in coordination with DPD and other partner agencies, will develop specific draft recommendations for amended or added text in the Policy Plan Elements or Area Plans to enhance the county's climate resiliency, beginning with Policy Plan Elements. In drafting these recommendations, OEEC will seek input from advisory groups, Boards, Authorities, and Commissions (BACs), the Planning Commission, the public, and other key stakeholders.
ii.	As authorized by the Board, staff will develop amendments to the Comprehensive Plan. OEEC will lead outreach efforts associated with any Comprehensive Plan amendments and will assist with technical climate resilience-related details. DPD will lead the Comprehensive Plan amendment processes and logistics, to include public hearings and amendment finalizations.
iii.	OEEC, in coordination with DPD, will identify specific sections that may be amended to enhance the county's climate resiliency. The identification will expand upon the work completed through the Resilient Fairfax Audit process. Sections "relevant to climate resilience" may include but are not limited to: those related to public facilities, human service facilities, transportation, or other critical facilities, land use that may mitigate urban heat island effect and/or flooding, floodplains, wetlands, shorelines, Environmental Quality Corridors, Resource Protection Areas, trees, green infrastructure, and impervious cover. The identification will also identify specific county departments and/or other partner agencies responsible for each of the Comprehensive Plan sections.

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Key Performance Indicators:

Outcome: Completion of Comprehensive Plan Policy updates

- *Identify Comprehensive Plan, Policy Plan elements that may be updated to enhance climate resilience.*

Equitable Implementation:

- ✓ Well-meaning policies can have negative unintended consequences on certain populations. Staff should consider if any Comprehensive Plan updates could adversely impact vulnerable populations.

How to Equitably Implement:

- ✓ Comprehensive Plan amendment updates should include a robust public engagement process that seeks to collect input from those that are often underrepresented. Stakeholders should be engaged through a variety of platforms, at times convenient to those most affected, and through materials translated into multiple languages.
- ✓ Staff should leverage the Inclusive Community Engagement Framework (ICEF).
- ✓ Staff should analyze compatibility of land uses with any change in land use designation that is adjacent to, or otherwise affects identified vulnerable communities.
- ✓ Staff should use One Fairfax to identify regions that are seeing an increase in vulnerable groups to prepare for increased need of services in that area.

Funding Opportunities

- *Community Development Block Grant Mitigation (CDBG-MIT) Program*
- *General Fund*
- *Staff Time*

Co-Benefits:

ADDITIONAL STRATEGIES FOR GOAL IAP.1

Strategy IAP.1b	**Update Strategic Plan to Enhance Climate Resilience** Pursue potential additions to the countywide Strategic Plan to enhance climate resilience during the anticipated regular update cycle. (The county's first-ever countywide Strategic Plan (2021) did include climate resilience strategies. However, with the completion of the Resilient Fairfax plan, additions could be made for greater specificity.)
Strategy IAP.1c	**Complete Climate Health Plan** Complete the Climate Health Plan, including considerations for resident and worker safety in extreme climate conditions such as extreme heat. (The Climate Health Plan process was started prior to the Covid-19 pandemic and has been on hold while Health Department resources are focused on pandemic response.).
Strategy IAP.1d	**Coordinate Hazard Mitigation & Emergency Management Planning with Climate Resilience Planning** Continue coordination between OEEC and DEMS to ensure alignment between hazard mitigation/emergency management plan updates and climate resilience plan updates. (OEEC and DEMS have coordinated for alignment between their respective plans, both scheduled for completion in 2022. In future iterations, there may be opportunities for further streamlining or even combining hazard mitigation and climate resilience planning processes).

Goal IAP.2

Data Collection: Coordinate and Enhance Data Collection to Inform Resilient Fairfax Implementation

STRATEGY IAP.2a

Develop Resilience Metrics and a Tracking System for Ongoing Assessment of Community Resilience and Improvements.

Strategy Description: Monitoring and evaluation is key to the success of the adaptation process. An ongoing assessment of community resilience and improvements helps to increase accountability, transparency, and long-term success while advancing community understanding of resilience measures. Resilience metrics are quantifiable variables that can be measured or tracked over time. They outline a set of indicators that help to track progress, measure improvement, identify priority needs, or monitor changes. While there is currently no national standard for resilience metrics, the Key Performance Indicators outlined in the Resilient Fairfax Plan for each prioritized strategy offer an initial opportunity to benchmark resilience implementation and evaluate progress. Future development of a climate resilience index could provide greater insight to the outcomes of Resilient Fairfax implementation and measurable progress in community resilience.

Climate Hazards Addressed:

Lead:	OEEC
Partners:	DCC, DEI, DEMS, DFS, DIT, FCDOT, DMB, DPD, DPSC, DPWES, FCPA, FCPS, FMD, HCD, HD, LDS, NVSWCD, One Fairfax, UFMD
Timeline:	Medium-Term (2-5 years), Ongoing
Cost:	$ ($100k or less)

Implementation Actions:

i.	Building from the Key Performance Indicators and tracking tool developed through the Resilient Fairfax Plan, design a monitoring and evaluation process, schedule, and tracking system to track implementation progress over time.
ii.	Develop an annual progress report that documents progress made, key successes, and future needs. Collect data and information from implementation leads on the status of each strategy using the Key Performance Indicators established in the Resilient Fairfax Plan. Data requests will be streamlined with other OEEC data requests for efficient use of partners' time and to reduce duplication of requests.
iii.	Explore development of a climate resilience index that includes resilience-related metrics, such as vulnerable populations, climate hazard exposure, environment, proximity to critical services/facilities, social factors, and built infrastructure.

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Integrated Action Planning Implementation Roadmaps

Key Performance Indicators:

Outcome: Ongoing monitoring and evaluation of resilience metrics.

- *Monitoring and evaluation schedule approved*
- *Development of a resilience index*
- *Number (#) of completed annual progress reports*
- *Number (#) of strategies started*

Equitable Implementation:

- ✓ Consider transparency and accountability.
- ✓ Consider how vulnerable populations contribute to overall metrics, and how social factors impact metrics.

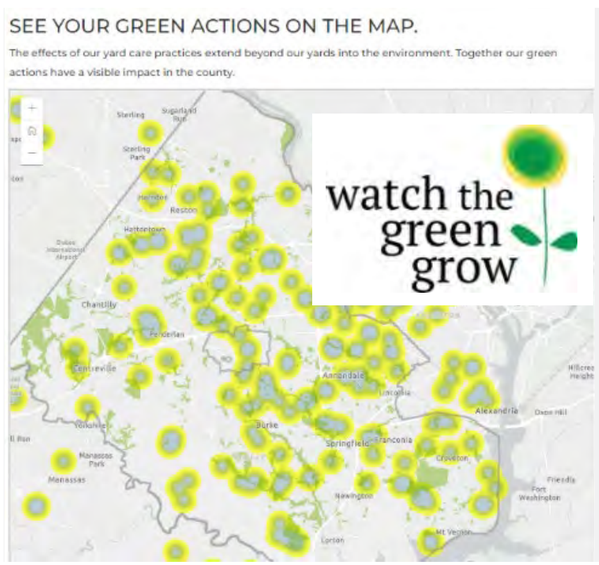
How to Equitably Implement:

- ✓ Establish regular reporting against the goals and targets of community resilience improvements.
- ✓ Break down the beneficiaries of funding spent on resilience by social factors and certain demographics.
- ✓ Build in the opportunity to reevaluate the success metrics based on whether positive change is observed.

Funding Opportunities:

- *General Fund*
- *Staff Time*

Co-Benefits:



Watch the Green Grow

Fairfax County's Watch the Green Grow program supports citizen action to care for the environment. Watch the Green Grow includes a mapping application that allows citizens to record environmentally friendly practices they complete in their yard. Citizens can select from a range of actions and upload photos to show progress. Each record adds a green spot to the county maps, resulting in an inspiring picture of citizen-led environmental stewardship.

ADDITIONAL STRATEGIES FOR GOAL IAP.2

Strategy IAP.2b	**Support Climate Research and Data Collection** Support climate-related research and data collection through partnerships with schools and universities, internship opportunities, and citizen science projects.
Strategy IAP.2c	**Create Consolidated Database of Flood-Prone Areas** Consolidate currently separate databases of flood-prone and storm-affected areas to provide comprehensive documentation of vulnerable areas. Pursue potential expansion of databases such as EDGR to enable long-term tracking.
Strategy IAP.2d	**Continue to Collect Rainfall Data** Collect localized rainfall data and consolidate regional rain gauge networks. Rainfall data collection and analysis should consider effects of impervious surfaces.
Strategy IAP.2e	**Create Database to Track Hazard Mitigation Action** Create a tracking database to record hazard mitigation retrofits and future cost savings and expenditures. Build upon and align with the Hazard Mitigation Plan documentation
Strategy IAP.2f	**Continue to Collect Tree Canopy Data** Regularly update tree canopy data layer to support strategic and equitable tree planting.
Strategy IAP.2g	**Continue to Collect Lidar Data** Support regular updates of Fairfax County GIS Lidar data to facilitate resilience-related GIS analyses.
Strategy IAP.2h	**Collect Climate Change and Vector-Borne Disease Data** Collect data on and map current disease-carrying insect vector populations throughout Fairfax County, considering future conditions impacts on vector populations.

Huntington Levee

The Huntington Levee project was a $41.2 million dollar project completed in June 2019. A levee and pumping station were constructed to protect homes and property in the Huntington neighborhood from flooding. The project mitigates flooding due to tidal surges from to Potomac River and flash flooding from the Cameron Run Watershed. The project included the development of approximately 4,800 linear feet of recreational trails along the top of the levee and around the ponding area for public recreation and enjoyment.

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Goal IAP.3 Funding: Obtain and Track Funding for Successful Resilient Fairfax Implementation

STRATEGY IAP.3a Develop a County Climate Fund.

Strategy Description: This strategy seeks to develop a county-level Climate Fund to mobilize financial resources and provide a dedicated funding source for county-led climate adaptation and resilience projects. The proposed Climate Fund would support implementation of Resilient Fairfax strategies and provide an identified funding source to be leveraged as a local match for federal, state, and other resilience related grants. The fund would not be county department specific, but rather available to all county departments who are implementing resilience related projects. The fund would promote implementation of projects that lessen the impact of climate change on Fairfax County's communities, with prioritization of more vulnerable communities. Development of a Climate Fund would need to consider startup capital, funding sources, and fund structure. The Climate Fund could leverage public funding to support Resilient Fairfax goals, fostering a more resilient community, economy, and environment.

Climate Hazards Addressed:

Lead:	DMB, OEEC
Partners:	DEI, DEMS, DPWES, FCPA, NVSWCD, OCA, One Fairfax, UFMD
Timeline:	Medium-Term (2-5 years)
Cost:	$$ ($100k - 500k)

Implementation Actions:

i.	Receive authorization to pursue development of a Climate Fund.
ii.	Conduct research on Climate Fund practices, structures, mechanisms, legal considerations, and other factors, for applicability to Fairfax County. Explore options for development of a county Climate Fund for county investment in climate adaptation and mitigation projects, with priority consideration for more vulnerable communities.
iii.	Identify and compile list of potential grant funding opportunities for which the Climate Fund could provide a local match. This action item should be coordinated with strategy IAP.3b.
iv.	In coordination with the development of AAAs (Strategy CRC 1.b) updates to the county CIP process (RIB 1.a), and flood risk reduction planning (CRC 3.a), identify project needs and level of funding required for project implementation. Projects nominated for Climate Fund investment may be larger in scope than those funded through the Environmental Improvement Program (EIP).
v.	Establish ranking criteria that will guide prioritization and selection of resilience projects to be funded through the Climate Fund. Criteria should consider factors including but not limited to: vulnerable populations, risk of climate hazard, scale of funding needed, and available grant funds

Key Performance Indicators:

Outcome: Approval and Development of Climate Fund.

- *Amount of funding ($) directed into Climate Fund*
- *Amount of funding ($) directed from Climate Fund to climate resilience related projects*
- *Amount of funding ($) from Climate Fund used to meet local match requirements*

Equitable Implementation:

- ✓ In the creation of a County Climate Fund, transparency is important to understand where funds are being directed. Consider the fairness and equity of how the Climate Fund will be used.

How to Equitably Implement:

- ✓ Define how the fund will prioritize vulnerable communities and consider prioritizing its use to these communities.
- ✓ Allocate a portion of the fund to reach vulnerable communities via community programming.

Funding Opportunities:

- *General Fund*
- *Staff Time*
- *State Clean Water Revolving Loan Funds*
- *Bonds*

Co-Benefits:

Tree Preservation and Planting Fund

The county's Tree Preservation and Planting Fund (TPPF) supports effort by the county and the community at large to protect, manage, and enhance its urban forest resources. The TPPF helps to collect, manage, and allocate funding that supports the preservation and management of existing forest as well as the planting of new trees. The TPPF can be applied towards a range of programs and policies, including tree planting to support watershed management plans, conservation of trees to align with the county's Tree Action Plan, and tree-related projects that are identified in the annual Environmental Improvement Plan

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Goal IAP.3 Funding: Obtain and Track Funding for Successful Resilient Fairfax Implementation

STRATEGY IAP.3b Pursue Federal and State Funding Opportunities.

Strategy Description: Federal and state grant opportunities could provide significant funding to support implementation of Resilient Fairfax strategies and the county's broader climate goals. This strategy will best position the county to be both competitive and successful in securing funding as it becomes available. To organize around funding and grant opportunities, the county should create an updated, central database to track and apply for grant opportunities and a streamlined process and approach to pursuing funding opportunities.

Climate Hazards Addressed:

Lead:	DMB, OEEC
Partners:	DEMS, DFS, DHCD, DOT, DPWES, FCDOT, FCPA, FCPS, One Fairfax, NVSWCD, NCS, UFMD
Timeline:	Short-Term (2 years or less)
Cost:	$$ ($100k - 500k)

What is BRIC?

Building Resilient Infrastructure and Communities (BRIC) is a FEMA grant funding opportunity that supports states, local communities, tribes, and territories in undertaking projects to promote resilience and reduce risks posed by natural hazards, including those due to climate change. A wide range of project are eligible for BRIC funding, including capability and capacity building activities, project scoping, and planning related activities, and hazard mitigation projects, including projects designed to increase resilience, protect public safety, and mitigate risk to critical services and infrastructure.

Implementation Actions:

i.	Create updated and consolidated database of all climate resilience-related federal and state funding opportunities, shared with all relevant departments. Example funding opportunities may include but are not limited to: Community Development Block Grant Programs (CDBG), Community Flood Preparedness Fund Grant Program (CFPF), the Flood Mitigation Assistance (FMA) Grant Program, Building Resilient Infrastructure and Communities (BRIC), Hazard Mitigation Assistance (HMA), Infrastructure Investment and Jobs Act, American Rescue Plan, National Coastal Resilience Fund (NCRF), National Coastal Wetlands Conservation Grant, Safeguarding Tomorrow Through Ongoing Risk Mitigation (STORM) grants, and Virginia Coastal Zone Management Program, among others.
ii.	Establish process for continued, coordinated tracking of resilience-related grant opportunities, proposals submitted, funding awarded, and projects conducted. Process should include clear identification of lead and support agency for each grant and/or funding opportunity, to provide clarity in leadership throughout the grant capture and completion. Process should identify "best fit" grant opportunities that both align with county priorities and that the county will be most competitive for.
iii.	Assess and identify need for dedicated staff to support grant tracking, proposal, active grant management.

Key Performance Indicators:

Outcome: Development of central grant tracking system.

- *Creation of grant tracking database that is updated, consolidated, and shared with all relevant departments*
- *Number (#) of grant opportunities pursued*
- *Amount of funding ($) secured for resilience projects*

Equitable Implementation:

- ✓ Consider how grant funding can be prioritized for vulnerable populations and which grants may designate funding for vulnerable populations.

How to Equitably Implement:

- ✓ Include funding opportunities that are specifically for the advancement of equitable initiatives, targeting vulnerable communities.
- ✓ Identify organizations that contribute to the advancement of vulnerable populations and cooperate on securing funding via joint application.
- ✓ Maintain accountability through tracking, especially for funding that is allocated for vulnerable communities.

Funding Opportunities:

- *General Fund*
- *Staff Time*
- *State Clean Water Revolving Loan Funds*
- *Bonds*

Co-Benefits:

ADDITIONAL STRATEGIES FOR GOAL IAP.3

Strategy IAP.3c	**Identify Funding for Long-Term Data Collection** Identify funding to support long-term data collection, analysis, and management.
Strategy IAP.3d	**Identify Additional Funding Opportunities** Identify additional funding opportunities including regional coordination, public-private partnerships, and cost-share programs to support resilience.

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Goal IAP.4

Interagency coordination: Enable Continued Interagency and Intergovernmental Collaboration on Climate Resilience

STRATEGY IAP.4a

Establish a Long-Term Interagency Collaboration System.

Strategy Description: Interagency collaboration is foundational to climate resilience planning and implementation and is already strongly promoted within Fairfax County by OEEC. OEEC was created in July 2019 and designated to lead interagency environmental coordination, including climate resilience. Throughout development of the Resilient Fairfax Plan, the Resilient Fairfax Planning Team, comprised of 20 county departments, coordinated closely with OEEC to inform project deliverables, including the Climate Projection Report, Vulnerability and Risk Assessment, Audit of Policies, Plans, and Programs, and the compiled Resilient Fairfax plan. Continued interagency collaboration is critical to the successful implementation of Resilient Fairfax, as resilience efforts are cross-cutting across county departments. OEEC also leads the county's engagement on climate change action with the MWCOG and the NVRC, among other regional entities, and is an active participant in the Northern Virginia Hazard Mitigation Plan. Other Fairfax County departments collaborate with regional and governmental entities across various topic areas. Establishing a system for climate resilience coordination across all county departments will streamline collaboration and encourage continued engagement. Continued inter- and intra-governmental collaboration on resilience is foundational to successful implementation of Resilient Fairfax. The collaboration system should be structured in a way that is helpful rather than burdensome to participating departments.

Climate Hazards Addressed:

Lead:	OEEC
Partners:	DCC, DEI, DEMS, DFS, DIT, FCDOT, DMB, DPD, DPSC, DPWES, FCPA, FCPS, FMD, HCD, HD, LDS, NVSWCD, One Fairfax, UFMD
Timeline:	Shovel Ready
Cost:	$ ($100k or less)

Implementation Actions:

i.	Identify County departments who should be involved in climate resilience collaboration long-term, led by OEEC. Beginning with the departments involved in the Resilient Fairfax planning process, these departments may include but are not limited to: DEMS, DFS, DPD, DPSC, DPWES, DVS, FCDOT, FCPA, FCPS, FMD, GIS, HCD, HD, HHS, LDS, NCS, NVSWCD, OCA, OEEC, One Fairfax, and UFMD. Designate a climate champion within each department.
ii.	Identify non-county infrastructure management and resilience-related entities who should continue to be involved in the county's climate resilience collaboration and data sharing long term.
iii.	Create a clear and user-friendly system for long-term collaboration. This system could include periodic Resilience Work Group meetings, information sharing protocols, a schedule for updates, or other options.
iv.	Establish process for continued, coordinated tracking of resilience-related grant opportunities, Conduct closer and more detailed collaboration between OEEC and agencies that are particularly imperative to the community's climate resilience and have expressed interest in closer collaboration, including but not limited to HHS, NCS, HD, LDS, FCPA and DPWES.
v.	Conduct yearly evaluations of the collaboration system and adjust as needed to improve coordination efforts.

Key Performance Indicators:

Outcome: Establishment of a regional collaboration system/framework.

- *Number (#) of county departments engaged/per year*
- *Number (#) of non-county entities engaged/per year*

Equitable Implementation:

- ✓ Implementation of collaboration between numerous entities can pose a challenge. Understand how information best reaches all entities.

How to Equitably Implement:

- ✓ Consider setting up a dashboard for quick access to important information and a designated place for representatives to share best practices in promoting equitable outcomes.
- ✓ Create a system to "tag" when A topic is related to equity and inclusion.
- ✓ During annual evaluation of the collaboration efforts, assess if/how efforts have improved equity.

Funding Opportunities:

- *General fund*
- *Staff time*

Co-Benefits:

Building on Existing Regional Coordination:

Fairfax County regularly engages and collaborates with regional entities such as the Metropolitan Washington Council of Governments (MWCOG) and the Northern Virginia Regional Commission (NVRC) to address climate change. County staff are active participants in numerous other regional and statewide initiatives and groups relating to climate resilience, including but not limited to: the Virginia Municipal Stormwater Association, the Virginia Forestry Association, the Virginia Association of Forest Health Professionals, Southeast Sustainability Directors Network, American Planning Association local and state chapters, Resilient Virginia, and the Virginia Energy and Sustainability Peer Network, among others

ADDITIONAL STRATEGIES FOR GOAL IAP.4

Strategy IAP.4b

Build County Staff Capacity to Lead on Climate Resilience Planning and Implementation through Staff Trainings, Capacity Building, and Continuity of Operations Guidance

Provide climate resilience and climate equity trainings as well as climate-oriented continuity of operations assistance to county staff, customized for relevance to their work. Consider staffing needs for implementation of resilience projects.

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Pillar 2: Climate Ready Communities (CRC):

The Climate Ready Communities pillar aims to ensure that Fairfax County communities are resilient, adaptable, and prepared for a changing climate. Climate-ready communities are well-connected with a strong social fabric, have access to the resources they need, are prepared for climate hazards, and live in physically resilient neighborhoods. To support climate-ready communities, we are working to address existing inequalities, improve access to county resources and aid, strengthen neighbor-to-neighbor connections, build greater social cohesion, reduce the climate vulnerabilities of our neighborhoods and development, and improve awareness of and readiness for climate change impacts.

Climate Ready Communities have:

- Strong social cohesion to support community response to climate hazards, including both long-term stressors and short-term shocks
- Homes and neighborhoods that are resilient to flooding, extreme heat, storms, and power outages
- Resources that are easily accessible to all members before, during, and after climate events

In the event of an emergency or natural disaster, 77% of survey takers said they could count on their neighbors for help and 75% have their neighbor's contact information.

CRC — Climate Ready Communities Strategies:

Goal CRC.1: Safe & Resilient Spaces	Goal CRC.2: Community Capacity	Goal CRC.3: Climate Ready Development
CRC.1a: Resilience Hubs: Pursue Development of a Network of Resilience Hubs in Climate Vulnerable Areas of the County	CRC.2a: Provide Community Aid and Engagement to Alleviate Resilience Needs	CRC.3a: Pursue and Implement a Flood-Risk Reduction Plan for The Fairfax County Community
CRC.1b: Develop Adaptation Action Areas Where Resilience Action is Prioritized	CRC.2b: Education & Guidance: Launch a Climate Resilience Education Program	CRC.3b: Propose County Incentive and Assistance Programs that Reduce Heat Related Climate Risk
		CRC.3c: Pursue Amendments to Zoning Ordinance and other County Code to Enhance Resilience
Additional Strategies ▪ CRC.1c: Expand Targeted Tree Plantings Enhance C-PACE Program ▪ CRC.1d: Outreach and Technical Assistance	*Additional Strategies* ▪ CRC.2c: Support Resilience Related Workforce Development ▪ CRC.2d: Expand Warning System	*Additional Strategies:* ▪ CRC.3d: Update the Public Facilities Manual

Goal CRC.1 — Create Safe and Resilient Spaces for The Community

STRATEGY CRC.1a — Pursue Development of a Network of Resilience Hubs in Climate-Vulnerable Areas of The County.

Strategy Description: Resilience hubs are community-serving facilities (often existing facilities) that distribute and centralize information and resources, connect residents to county assistance, support residents' resilience to climate events, and build community capacity and connection. These facilities may be upgraded to enhance their physical resilience to climatic effects, to ensure continuity of service during climate hazards. Resilience hubs are typically located in existing facilities that are trusted by community members, such as recreation centers, community centers, libraries, non-profit facilities, or faith centers. On a day-to-day basis, hubs function as a space for community gathering or events, location for trainings, and as a centralized place for community members to seek resources. Resilience hubs are most effective when there is strong partnership between the local government (the county) and community organizations and/or networks; resilience hubs should be community-led and community-serving. This strategy will explore options for development of a network of resilience hubs in the areas of Fairfax County, with a prioritization for areas with the greatest need and that are most vulnerable to climate change impacts. Resilience hubs should not be confused with "shelter" facilities, which follow specific emergency management protocols and plans. Resilience hubs help to build greater community connection and enhanced capacity to adapt and respond to climate related events.

Climate Hazards Addressed:

Lead:	OEEC
Partners:	DEMS, DFS, DPD, DPSC, DPWES, FCPA, FCPS, FMD, GIS, HCD, HD, LDS, NCS, One Fairfax
Timeline:	Medium-Term (2-5 years)
Cost:	$$$ ($500k - 1 million)

What Are Resilience Hubs?

Resilience Hubs are community-serving facilities augmented to support residents, coordinate communication, distribute resources, and enhance communities' capacity to adapt to climate change. Existing community centers, libraries, and non-profit entities are among potential sites for resilience hubs. The Urban Sustainability Director's Network has a Guidance Document to provide step-by-step support to local governments, communities, and partners interested in developing a resilience hub.

Implementation Actions:

i.	Identify areas of the county where there is the greatest need and greatest benefit for resilience hubs. Utilize data sources such as Resilient Fairfax, One Fairfax data, Adaptation Action Areas, and others to determine these locations.
ii.	Inventory existing network of centers that could serve as "resilience hubs." Prioritize trusted locations within community, such as community centers (NCS), recreation centers (FCPA), places of worship, and non-profit facilities that provide essential services to the community.
iii.	Compile site information to support evaluation of location for resilience hub. Consider building condition, location, transportation and access, site capacity, key climate hazards impacting that community, planned and/or required retrofits, typical operations and staffing, and other needs as identified by the community.
iv.	Conduct outreach to community organizations, nonprofits, faith groups, or other community serving groups in identified areas (CRC.2a) to begin county-community collaboration on the visioning of a resilience hub network in the community.
v.	Identify a pilot resilience hub location and work with facility managers and community partners to build out community resilience offerings.
vi.	Evaluate potential network of resilience hubs, with priority consideration to identified areas in CRC.2a and in collaboration with community partners. Consider staffing and funding needs for resilience hub implementation. As appropriate, explore establishing working groups for each resilience hub location.

Key Performance Indicators:
Outcome: Launch of Resilience Hub pilot and/or community -led network.

- *Potential Resilience Hub locations identified*
- *Number (#) of community members served by Resilience Hub(s)*

Equitable Implementation:

- ✓ Consider needs of vulnerable populations to ensure accessibility to resilience hubs.
- ✓ Consider which areas of the county would benefit the most from or have greatest need for resilience hubs.

How to Equitably Implement:

- ✓ Meet with community organizations and partners to foster collaboration and identify areas that will best serve as resilience hubs.
- ✓ Identify transportation/evacuation routes that would assist access to the hubs.

Funding Opportunities:

- *BRIC*
- *Community Development Block Grant*

Co-Benefits:

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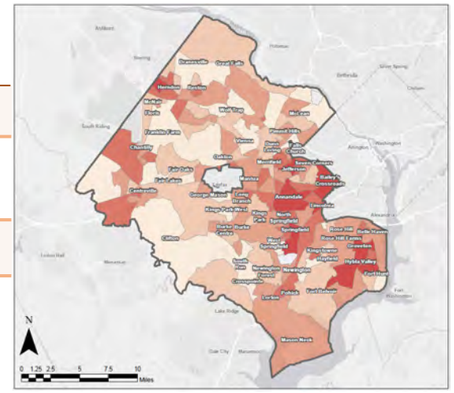
Goal CRC.1 Create Safe and Resilient Spaces for The Community

STRATEGY CRC.1b Develop Adaptation Action Areas Where Resilience Action Is Prioritized.

Strategy Description: Adaptation Action Areas (AAAs) are a land-use planning and policy tool that can be used to guide and prioritize climate adaptation implementation. AAAs may be used to identify, map, and establish locations of greatest need within Fairfax County where the county will take resilience action first. Development of the AAAs will be informed by complete analysis and technical reports, including the Resilient Fairfax Vulnerability and Risk Assessment, the Climate Projections Report, the Audit of Existing Policies, Plans, and Programs, the county's flood risk reduction efforts, and the NASA Develop Urban Heat Island Effect Study. These reports, along with the best available science, will inform the mapping of AAAs and include consideration for: flood-prone areas, urban heat islands, population vulnerability, and low adaptive capacity, among other factors. Development of AAAs provides a comprehensive and cohesive approach for the county to effectively implement resilience related policies, programs, and projects.

Climate Hazards Addressed:

Lead:	OEEC
Partners:	DCC, DEI, DEMS, DFS, FCDOT, DPD, DPWES, FCPA, HCD, HD, NCS, NVSWCD, OCA, One Fairfax, LDS, UFMD
Timeline:	Medium-Term (2-5 years)
Cost:	$$ ($100k - 500k)



Implementation Actions:

i.	Identify and map potential AAAs based on climate risk and the One Fairfax Vulnerability Index. AAA considerations could include but are not limited to: flood-prone areas, urban heat islands, population vulnerability, and low adaptive capacity.
ii.	Draft options for incorporation of AAAs. Options could include but are not limited to: using AAAs during the Capital Improvement Program process to prioritize implementation of resilience projects, using AAAs to prioritize funding of Resilient Fairfax implementation.
iii.	Present options for incorporation of AAAs for BOS approval and receive authorization to incorporate AAAs.
iv.	Prioritize implementation and engagement in AAAs. Consider piloting resilience approaches in AAAs that can be scaled up community wide.

Key Performance Indicators:

- *Completion of proposed AAAs*
- *Approval of AAAs*

Equitable Implementation:

✓ Neighborhoods may reflect similar demographics but have different needs or desires. Consider how AAAs will incorporate community input for these decisions.

How to Equitably Implement:

✓ Involve community members and organizations in the decision-making process.

✓ Conduct surveys or other means of collecting feedback to understand how a pilot AAA program could affect certain populations.

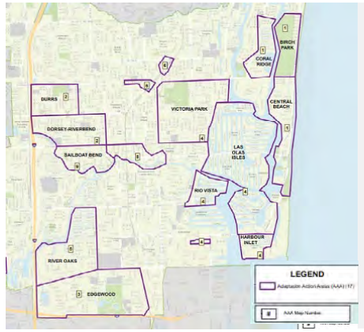
✓ Include equity factors in determining locations for AAAs.

✓ Leverage the Inclusive Community Engagement Framework (ICEF).

Funding Opportunities:

- *BRIC*
- *Virginia*
- *Community Flood Preparedness Fund (CDBG-MIT)*

Co-Benefits:



Case Study: Adaptation Action Areas

Fort Lauderdale, Florida updated their comprehensive plan to designate Adaptation Action Areas (AAAs) to provide the foundation for the development and implementation of adaptation measures to reduce risk to climate change impacts, such as sea level rise. AAAs are designated areas that are prioritized for infrastructure and other resilience improvements to reduce climate risk. The mapped AAAs and identified capital improvement projects within the AAAs are reviewed and updated annually by staff to inform funding needs and project prioritization.

ADDITIONAL STRATEGIES FOR GOAL CRC.1

Strategy CRC.1c	**Expand Targeted Tree Plantings** Expanded targeted tree plantings in vulnerable areas, expanding upon existing Urban Forestry Management Division efforts and findings from the NASA Develop heat and tree canopy layer.
Strategy CRC.1d	**Enhance Commercial Property Assessed Clean Energy (C-PACE) Program Outreach and Technical Assistance** Support utilization of the existing C-PACE program through enhanced outreach and technical assistance.

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Goal CRC.2

Build Community Capacity to Understand, Be Ready For, Respond To, And Bounce Back from Climate Change Impacts

STRATEGY CRC.2a

Provide Community Aid and Engagement to Alleviate Resilience Needs.

Strategy Description: More vulnerable populations will be disproportionately impacted by climate change. There are many existing county resources that can help. However, many residents are unaware of these resources, do not know how to request services, or are hesitant to access aid. This strategy focuses on community engagement to continue identifying areas in need, and to better connect residents to resilience-related support and resources. Meaningful engagement should center traditionally underserved populations, expanding the work of Equity Impact Plans and One Fairfax. This strategy includes identification of community-based partners and community-specific needs, identification of pressing needs, and enhancing and streamlining access to aid from multiple county departments. This strategy will support improved preparedness and resilience of the county's more vulnerable populations. (For education and guidance, please see strategy CRC.2b).

Climate Hazards Addressed:

Lead:	OEEC
Partners:	CSB, DEMS, DFS, DPD, DPWES, FCPA, FCPS, HCD, HD, LDS, NCS, NVSWCD, One Fairfax
Timeline:	Short-Term (2 years or less); Ongoing
Cost:	$$ ($100k - 500k)

Implementation Actions:

i.	Identify existing and new key partners for a climate resilience engagement program, including county agencies and community-based organizations who hold existing trusted relationships with vulnerable populations in Fairfax County. Identify existing services and aid relating to climate hazards that could be streamlined, expanded, or made more accessible. Build upon work completed through the Resilient Fairfax Audit and Plan process.
ii.	Develop an engagement program. Work collaboratively to develop the climate resilience community engagement program, using the county's Inclusive Community Engagement Framework (ICEF).
iii.	Identify pressing needs. Identify existing climate related issues and areas with urgent needs, such as recurrent flooding or extreme heat. Build upon work from the Resilient Fairfax vulnerability assessment process. Work with CSB, NCS, DFS, and DEMS to identify specific needs of older adult populations and low-income populations with regards to climate change events.
iv.	Streamline and facilitate access to existing climate hazard-related resources and assistance from numerous departments such as: flood mitigation assistance (DPWES), energy resilience for frequent power outages, energy assistance during extreme temperatures (DFS), energy efficiency and other building improvements for enhanced resiliency (DHCD, OEEC), relocation for repetitive loss properties (DPWES), and/or health services relating to climate hazard effects (DFS, CSB, HD, HHS). Produce easy-to-understand guides to help residents understand what types of aid are available. Provide centralized location for climate hazard related resources, both virtually and in person. Resilience hubs (CRC 1a) could potentially serve this purpose.

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Climate Ready Communities Implementation Roadmaps

Key Performance Indicators:

Outcome: Climate Resilience Community Engagement Program developed.

- *Number (#) of community partners/organizations engaged*
- *Aid distributed to community members (# of community members served)*

Equitable Implementation:

- ✓ Consider how to engage with underserved communities on a regular ongoing basis.
- ✓ Ensure a balanced understanding of community interests and concerns.

How to Equitably Implement:

- ✓ Leverage the Inclusive Community Engagement Framework (ICEF)
- ✓ Choose times and locations that work best for a variety of different schedules.
- ✓ Use various engagement approaches based on what will include representative demographics of community members and voices of the more vulnerable populations.
- ✓ Ensure residents are given clear help (in their language of choice) for aid applications that may be confusing or difficult to navigate.

Funding Opportunities:

- *Robert Wood Johnson Foundation grant opportunities*
- *Climate and Clean Energy Equity Fund*

Co-Benefits:

Community Partners

Throughout the Resilient Fairfax Plan development process, staff gathered recommendations for community partners, faith-based institutions, and other community organizations who may wish to participate in the implementation of this pillar's strategies. These organizations include but are not limited to: Cornerstones, George Mason Center for Climate Change Communication, Medical Society Consortium for Climate and Health, Virginia Clinicians for Climate Action, Faith Alliance for Climate Solutions, and American Lung Association.

Goal CRC.2 Build Community Capacity to Understand, Be Ready For, Respond To, And Bounce Back from Climate Change Impacts

STRATEGY CRC.2b Launch a Climate Resilience Education and Guidance Program

Strategy Description: To be successful, climate adaptation and resilience strategies require local community awareness, understanding, buy-in, and participation. Climate resilience education for the community should include guidance documents on various climate-related topics such as emergency preparedness, flood mitigation, natural resource resilience, and energy resilience, among others. Education should also include educational resources on introductory concepts of climate change, such as background on climate science and impacts on public health and safety. Development of all educational materials will consider the intended audience, to ensure materials are translated, formatted, and accessible.

Climate Hazards Addressed:

Lead:	OEEC
Partners:	DCC, DEMS, DFS, DPWES, FCPA, FCPS, HCD, HD, LDS, NCS, NVSWCD, One Fairfax
Timeline:	Medium-Term (2-5 years)
Cost:	$$ ($100k - 500k)

Fairfax County Public Schools: Get2Green Program:

The Fairfax County Public Schools Get2Green is an environmental stewardship program that provides guidance and resources to bring hands-on environmental action into classrooms and the community. The Get2Green program supports student eco-teams that engage in student-driven sustainability activities such as reducing waste, conserving energy, planting, and maintaining habitat, and tending to edible gardens.

Implementation Actions:

i.	Identify key partners for a climate resilience education campaign, including local schools (Get2Green), community-based organizations, county departments, and other partners with existing community education programs such as OPA, FCPA, NCS, DEMS, DPWES, and NVSWCD. Engage with the community to increase understanding of and support ongoing conversation on climate resilience.
ii.	Develop Climate Change 101 educational materials to provide background on climate science, climate hazards, climate mitigation, climate adaptation and resilience, and climate impacts on public health and safety.
iii.	Promote climate hazard-related personal emergency preparedness and response training materials for residents and local businesses, leveraging existing programs and resources from DEMS.
iv.	Develop flood resilience guidance: Promote and develop guidance for flood resilience measures, such as elevating structures or equipment, wetproofing, dry proofing, flood insurance, and small-scale green infrastructure for property owners and operators/landlords. Coordinate with existing campaigns led by DPWES and with regional partners, such as NVRC, to align efforts.
v.	Develop heat resilience guidance: Develop guidance on heat resilience retrofits such as cool roofs, cool pavements, tree canopies and evapotranspiration, building orientation and design for heat resilience, and energy efficiency for property owners and operators/landlords.
vi.	Develop wind, storm, and energy resilience guidance: Develop guidance for severe storm, wind, and energy resilience (power outage prevention) retrofits, such as solar plus storage, back-up power, infrastructure hardening, and pre-storm actions.
vii.	Develop agricultural guidance. Connect local farmers and landowners to education and funding opportunities for regenerative agricultural practices.

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Key Performance Indicators:

- *Number (#) of outreach materials developed*
- *Number (#) of climate resilience outreach events held*
- *Number (#) of users on Climate Viewer*
- *Number (#) of views of guidance documents and/or outreach materials*

Equitable Implementation:

- ✓ Consider how this information will be made available to all residents.
- ✓ Consider how the county can strategically identify partners that will reach a diverse audience.

How to Equitably Implement:

- ✓ Partner with community-based organizations and entities that are on the ground and connected to underrepresented communities.
- ✓ Develop education materials that are easily understood, available online and in a designated location, and available in multiple languages.

Funding Opportunities:

- *EPA Environmental Education Grants*
- *NOAA Environmental Literacy Grants*

Co-Benefits:

ADDITIONAL STRATEGIES FOR GOAL CRC.2

Strategy CRC.2c	**Support Resilience-Related Workforce Development** Pursue workforce development initiatives to develop resilience-related construction and contracting skillsets, such as pervious paver installation, solar-plus-storage installation, green infrastructure installation, and other skillsets.
Strategy CRC.2d	**Expand Warning System** Promote early warning system to warn community members of upcoming heat events. Explore tiered warning system approach for heat. Promote and leverage existing Fairfax Alerts, National Weather Service, and other warning systems.

Goal CRC.3 — Integrate Climate Hazard and Resilience Considerations into Development Regulations, Processes, And Retrofits

STRATEGY CRC.3a — Pursue and Implement a Flood-Risk Reduction Plan for the Fairfax County Community.

Strategy Description: This strategy aligns with and advances the "Flood Risk Reduction Plan" recently initiated by DPWES. This strategy is focused on reducing flooding risk that threatens the health, safety, and welfare of county residents in their neighborhoods. (For flooding of county government facilities, please see Strategy RIB.1b). The Fairfax County community experiences multiple types of flooding, including urban, inland, riverine, and coastal flooding, each of which requires a customized approach. Additionally, flood risk reduction requires action for both new and existing development. Any changes made to county policies and standards apply only to new development or re-development. For existing neighborhoods with flooding issues, retroactive physical capital improvement projects may be needed. Across all approaches, projected climate conditions and impacts should be factored into flood risk reduction efforts.

Climate Hazards Addressed:

Lead:	DPWES, LDS
Partners:	DCC, DEMS, DPD, FCPA, OEEC, One Fairfax
Timeline:	Medium-Term (2-5 years)
Cost:	$$$ ($500k - 1 million)

Implementation Actions:

i.	(In progress): Initiate project. Complete project initiation tasks, including establishment of: an interagency workgroup, flood risk reduction approach, community engagement and equity approach, benchmarking against other jurisdictions, and draft levels of service.
ii.	(In progress): Complete detailed analysis on existing and future flooding issues. Quantify and categorize existing and future flooding issues in the county. For future flooding, utilize the latest accepted climate projections.
iii.	(In progress): Complete detailed analysis on existing flood-related policies, standards, and processes, building upon work completed through the Resilient Fairfax Audit. Consider a lens of future climate projections.
iv.	Draft flood risk reduction recommendations, including potential updates to county policies, design standards and guidelines, ordinances, processes, and capital projects.
v.	Identify and prioritize capital projects for flood alleviation. The identification of areas in need of flood alleviation capital projects may be facilitated through the Adaptation Action Area process (see Strategy IAP.2c). The prioritization of capital projects may be facilitated through a revised Capital Improvement Program (CIP) process (see Strategy RIB.1a.).
vi.	If applicable and approved by the BOS, implement approved updates.

Note: For flood-related upgrades to county government facilities, please see Strategy RIB.1b. For small-scale property owner flood-proofing guidance, please see Strategy CRC.2b. For Adaptation Action Areas, please see Strategy CRC.1b. For Capital Improvement Program (CIP) process updates please see Strategy RIB.1a.

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Key Performance Indicators:

- *Completed analysis and categorization of flooding issues*
- *Completed analysis of county development reviews standards and procedures*
- *Completed flood risk reduction recommendations*
- *Number (#) of flood risk reduction capital improvement projects planned, budgeted for, and implemented*

Equitable Implementation:

✓ Well-meaning development regulations can sometimes have negative unintended consequences on certain populations.

How to Equitably Implement:

✓ Provide a robust public engagement process for changes to development regulations, that seeks to collect input from those that are often underrepresented.

✓ Assess development regulations/restrictions in residential areas to ensure that regulations do not result in displacement of existing community members.

Funding Opportunities:

- *BRIC*
- *Virginia Community Flood Preparedness Fund*
- *Flood Mitigation Assistance*

Co-Benefits:

Urban Design Guidelines

Urban Design Guidelines provide detailed urban design and streetscape guidance intended to be used by citizens, developers, designers, Fairfax County staff, and the Fairfax County Planning Commission and Board of Supervisors when proposing, designing, or reviewing development. Fairfax County has developed and published several Urban Design Guidelines, including guidelines from Commercial Revitalization Districts and Areas, as well as district areas guidelines such as Richmond Highway and Annadale. Design guidelines includes many elements that support a resilience county, such as inclusion green infrastructure, urban park design, and stormwater management.

Goal CRC.3 Integrate Climate Projections and Resilience Considerations Into Development Regulations, Processes, And Retrofits

STRATEGY CRC.3b Propose County Guidance and Assistance Programs That Reduce Heat-Related Climate Risk.

Strategy Description: Extreme heat is a pressing issue with increasing impacts on both public health and infrastructure. This strategy is focused on encouraging new and existing development to consider heat-mitigation measures in their design, construction or redevelopment, and operations and maintenance. Guidance materials, potential incentive programs, and integration of heat-related climate risk into development review processes can mitigate the impact of extreme heat to residents, particularly more vulnerable populations. A comprehensive approach can better prepare neighborhoods for more extreme and frequent heat conditions.

Climate Hazards Addressed:

Lead:	EDA, LDS, OEEC
Partners:	DCC, DEMS, FCDOT, DPD, FCPA, OCA, UFMD
Timeline:	Medium-Term (2-5 years)
Cost:	$$ ($100k - 500k)

Implementation Actions:

i.	Complete detailed analysis to identify a suite of applicable cooling measures for priority heat islands as identified by the Resilient Fairfax planning process and NASA Develop's urban heat island assessment. Example cooling measures could include but are not limited to cool roofs and cool pavements, targeted tree canopy and green space for evapotranspiration, building and site orientation for heat mitigation, and building material choice and efficiency, among others.
ii.	Complete detailed analysis of existing standards and processes. Identify opportunities to update existing standards and processes to consider heat mitigation. Examples include heat-specific updates to urban design guidelines, sustainable development policy for capital projects, ordinances relating to impervious coverage limitations, etc.
iii.	Develop design guidelines that are a practical reference for planners, building developers, and other stakeholders with influence in design/construction of projects in Fairfax County. The guidelines will serve as a resource for public and private development (both new construction and retrofits). The design guidelines will provide guidance on how to evaluate the building or site/landscape for heat vulnerabilities and offer guidance/considerations on cooling measures and opportunities to enhance resiliency. Guidelines should support the use of native plantings when feasible and effective. These guidelines can build on the use of Urban Design Guidelines for Commercial Revitalization Districts and Areas and certain Mixed-use Centers as designated on the Fairfax County Comprehensive Plan including the Tysons Urban Center and the Reston Transit Station Areas.
iv.	Identify additional financing or incentive options. Highlight and align with existing financing and incentive programs that can be used for heat mitigation retrofits or cooling measures, such as C-PACE or potential green infrastructure incentive programs.

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Key Performance Indicators:

Outcome: Draft Design Guidelines developed

- *Completion of heat mitigation guidelines*
- *Number (#) of heat island neighborhoods implementing heat interventions*

Equitable Implementation:

- ✓ Consider what type of assistance will best support retrofits in heat-vulnerable neighborhoods.
- ✓ Consider how additional review and requirements could affect affordability.

How to Equitably Implement:

- ✓ Consider best practices for inclusion of retrofits that can be applied to low-income housing projects to include best practices (e.g., increase in tree cover/street trees, pervious surface requirements).
- ✓ Consider offering density incentives for added heat-mitigating features, to offset affordability of units with these features.

Funding Opportunities:

- *BRIC*

Co-Benefits:

Goal CRC.3 Integrate Climate Projections and Resilience Considerations into Development Regulations, Processes, And Retrofits

STRATEGY CRC.3c Pursue Amendments to Zoning Ordinance and other County Code Chapters to Enhance Resilience

Strategy Description: The Zoning Ordinance is one of the primary ordinances that guides land use in Fairfax County. This strategy may pursue potential amendments to the Zoning Ordinance and other County Code Chapters to enhance climate resilience in areas identified by the Resilient Fairfax Audit, aligning implementation with the Comprehensive Plan, the Countywide Strategic Plan, and Resilient Fairfax. This strategy connects to other strategies in the Implementation Roadmap. This strategy is focused on the Zoning Ordinance specifically to enable a focused effort on this key ordinance and to better enable BOS authorization of such amendments to enhance resilience. Amendments associated with Resilient Fairfax will be aligned with other ongoing, scheduled, considered, and planned amendments.

Climate Hazards Addressed:

Lead:	DPD, DPWES, LDS, OEEC
Partners:	DCC, DEMS, FCPA, FCHD, NCS, OCA, UFMD
Timeline:	Long-Term (5-8 years)
Cost:	$ ($0 - 100k)

Implementation Actions:

i.	OEEC will identify regulatory document sections that are relevant to climate hazard resilience and identify opportunities to address resiliency. Topics may include but are not limited to limitations on impervious coverage and pavement, parking requirements ("Parking Reimagined"), density and open space, tidal flooding setbacks, stormwater and floodplain regulations, environmental site assessments, landscaping requirements (including urban trees), land use definitions for resilience-related uses, energy production and storage, and environmental amendments associated with other plans and programs such as CECAP and Fairfax Green Initiatives.
ii.	Lead and partner agencies, in coordination with OEEC, will aid in the analysis of identified regulatory changes. Specifically, LDS may lead any amendments related to site plans, parking, floodplain requirements, and landscaping and screening provisions. DPWES will aid in any amendments relating to floodplains and flood mitigation. Urban Forestry Management Division will aid in any amendments relating to trees.
iii.	Lead and partner agencies, in coordination with OEEC, will bring any proposed amendment topics to the Board for consideration. If supported, the amendments will be added to the agency's work program.
iv.	As authorized by the Board, develop amendments to the relevant documents. All proposed amendments will be drafted and revised in coordination with applicable stakeholder groups, Boards, Authorities, and Commissions (BACs), and the public.
v.	Agencies will proceed through the amendment process, to include outreach, draft amendments, and public hearings.

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Climate Ready Communities Implementation Roadmaps

Key Performance Indicators:

Outcome: Draft Design Guidelines developed

- *Completion of inventory and analysis of Zoning Ordinance sections where amendments would enhance resilience*
- *Authorization of Zoning Ordinance amendment updates and incorporation in work program*

Equitable Implementation:

- ✓ Well-meaning regulations can have negative unintended consequences on certain populations. Consider whether any amendments negatively impact climate conditions in other areas.

How to Equitably Implement:

- ✓ Conduct a robust public engagement process beyond the public hearings for the Zoning Ordinance amendment process, seeking to collect input from those that are often underrepresented. Engage stakeholders during times and with platforms that are convenient to those most affected. Use best practices for collecting input from all stakeholders including various platforms translated into multiple languages.
- ✓ Leverage the Inclusive Community Engagement Framework (ICEF).
- ✓ Assess regulations for residential zoning districts to ensure that regulations do not result in displacement of existing community members.
- ✓ Ensure residential zones do not exclude multi-generational families, single-earner families, etc. on the premise of alleviating a climate resilience factor.
- ✓ Ensure zoning does not exclude certain populations from accessing critical facilities, including public service facilities, parks, recreation, and natural resource areas. Ensure existing amenities are maintained in vulnerable areas.

Funding Opportunities:

- *BRIC*
- *Community Development Block Grant Mitigation (CDBG-MIT)*

Co-Benefits:

ADDITIONAL STRATEGIES FOR GOAL CRC.3

Strategy CRC.3d	**Update the Public Facilities Manual** Pursue updates to the Public Facilities Manual to consider climate projections and enhance resilience.

(This strategy is listed as an "additional" rather than a prioritized strategy at this time because preceding prioritized strategies would likely need to occur first, such as Comprehensive Plan, Zoning Ordinance, and other amendments.).

Resilient Infrastructure and Buildings Implementation Roadmaps

Pillar 3: Resilient Infrastructure and Buildings (RIB):

The Resilient Infrastructure and Buildings pillar aims to ensure that the infrastructure and buildings in Fairfax County can withstand climate impacts, keep residents safe, reduce service disruptions, and improve countywide resilience. This pillar includes embedding resilience considerations into infrastructure decisions, so that new and upgraded infrastructure are ready for a changing climate. It advocates for the safety of our buildings, accessibility of the transportation network, and reliability of our critical infrastructure. These actions help us maintain key services and keep residents safe.

Resilient infrastructure and buildings:

- Can withstand extreme temperatures, flooding, and severe storms
- Are built and prepared for future conditions
- Are energy-resilient, energy efficient, and leverage diverse & clean energy sources with backup power
- Support safe movement to jobs, homes, critical services, and other points of interest

In addition to **buildings**, this pillar includes enhancing resiliency of critical infrastructure and facilities in the **transportation**, **water**, **energy**, **communications**, and **public services** sectors.

RIB — **Resilient Infrastructure and Buildings Strategies:**

Goal RIB.1: Resilient County Government Buildings and Infrastructure	**Goal RIB.2:** Advocacy for Resilient Infrastructure
RIB.1a Update Capital Improvement Program Process to Include Climate Resilience Considerations RIB.1b: Enhance Energy Resilience for County Buildings and Facilities	RIB.2a: Energy Resilience Advocacy and Partnership
Additional strategies: ▪ RIB.1c: Enhance Heat Resilience for County Buildings and Facilities ▪ RIB.1d: Update Architecture and Engineering (A/E) Procurement ▪ RIB.1e: Climate Projections in WW planning	*Additional strategies:* ▪ RIB.2b: Advocate for Resilience Updates to the Building Code ▪ RIB.2c: Advocate and Partner with Transportation Agencies to Support Transportation Resilience

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Goal RIB.1 County Infrastructure Decisions: Incorporate Climate Projections and Resilience into County Infrastructure Decisions

STRATEGY RIB.1a Update Capital Improvement Program Process to Include Climate Resilience Considerations.

Strategy Description: The Capital Improvement Program (CIP) is Fairfax County's five-year roadmap for creating, maintaining, and funding present and future capital infrastructure requirements. It provides the framework for the investment in and planning of capital projects. This strategy promotes revising the CIP evaluation and project prioritization process to integrate climate resilience into capital projects and to consider impacts and consequences from projected extreme heat, heavy precipitation, coastal flooding, severe storms, and other climatic conditions into infrastructure planning and development. These climate hazards can impact function, maintenance costs, and lifespan. Integration of climate projections and resilience enhancements into the county's CIP will ensure continued provision of critical county services that protect public health and safety and that capital investments provide their intended function and benefit over their lifespan.

Climate Hazards Addressed:

Lead:	DMB, DPWES, OEEC
Partners:	DEMS, FCDOT, DPWES, UFMD, FCPA, OCA, One Fairfax, UFMD
Timeline:	Medium-Term (2-5 years)
Cost:	$$$ ($500k - 1 million)

Implementation Actions:

i.	Review the existing CIP process to identify revisions needed to embed consideration of: climate change projections, potential risks from climate hazards, and resiliency enhancements for the county's infrastructure and facilities. Resilience enhancements should consider ways a project could enhance overall community resilience. Explore screening criteria and identify selection criteria for projects that support the county's resilience goals. Identify pathways to prioritize implementation and funding for climate resilience projects.
ii.	Build a project list of identified resilience projects, including those identified in the Flood Risk Reduction plan and the Hazard Mitigation Plan. Integrate One Fairfax and build upon the completed analysis of the Vulnerability and Risk Assessment to prioritize projects that support the needs of vulnerable populations and/or address top climate risks to the county.
iii.	Partner with staff responsible for capital improvement evaluation, project management, and implementation to draft proposed revisions.
iv.	Proceed through revision and approval processes to encourage capital projects that mitigate risk and build resilience to future projected extreme heat, heavy precipitation, coastal flooding, and severe storms. Coordinate with the department responsible for asset management or use in advance of project approval to ensure there are no adverse impacts.
v.	Monitor and evaluate CIP implementation results and project outcomes. Adjust process and/or prioritization criteria if needed.

Key Performance Indicators:
Outcome: Updated CIP process.

- *Number (#) of CIP projects identified on project list for resilience*
- *Board approval of CIP process updates*

Equitable Implementation:

- ✓ Consider how to factor needs of disadvantaged communities into Capital Improvement Program process.
- ✓ Identify how the county can monitor the effects of proposed projects on disadvantaged populations.
- ✓ Consider how to maintain the integrity and fabric of communities that are seeing significant impacts from flooding due to their location, while protecting them from potential risk and loss during storm events.

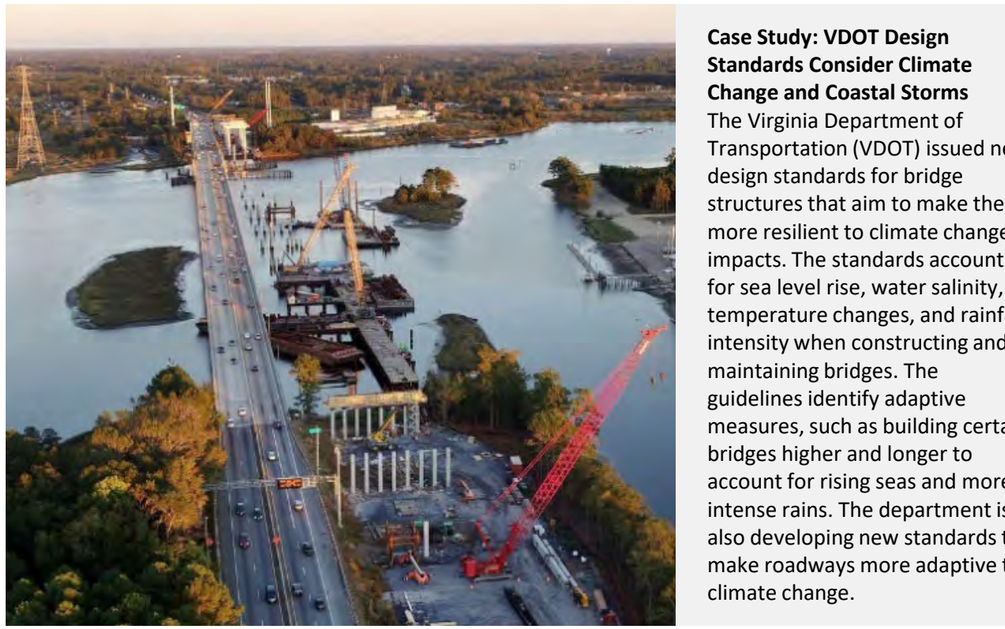
How to Equitably Implement:

- ✓ Ensure distribution of projects to areas most impacted by climate change and serving vulnerable communities.
- ✓ Build in method to identify and highlight proposed projects that disproportionately impact vulnerable communities and prioritize these projects.

Funding Opportunities:

- *BRIC*
- *Hazard Mitigation Grant Program (HMGP)*

Co-Benefits:



Case Study: VDOT Design Standards Consider Climate Change and Coastal Storms
The Virginia Department of Transportation (VDOT) issued new design standards for bridge structures that aim to make them more resilient to climate change impacts. The standards account for sea level rise, water salinity, temperature changes, and rainfall intensity when constructing and maintaining bridges. The guidelines identify adaptive measures, such as building certain bridges higher and longer to account for rising seas and more intense rains. The department is also developing new standards to make roadways more adaptive to climate change.

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Goal RIB.1 County Building and Facility Resiliency: Improve Climate Resiliency of County Buildings and Facilities

STRATEGY RIB.1b Enhance Flood Resilience of County Buildings and Other Facilities.

Strategy Description: Fairfax County has implemented certain best practice flood resilience measures for county facilities, such as fire stations, water treatment plants, Emergency Operations Centers, and other public buildings and facilities. This strategy would include prioritization of public facilities that are currently facing flooding issues and facilities that are projected to face flooding issues due to climate change impacts. Improving flood resilience of county facilities will support continuity of operations and the county's ability to provide critical services to vulnerable populations. Flood resilience actions could include but are not limited to: elevating or relocating critical infrastructure, flood proofing measures, and improving accessibility.

Climate Hazards Addressed:

Lead:	FMD
Partners:	DEMS, DFS, DPD, DPWES, FCPA, FCPS, HD, NCS, OEEC
Timeline:	Short-Term (2 years or less)
Cost:	$ ($100k or less)

Executive Orders: Virginia Governor Ralph Northam issued two executive orders that support resilience in the state through proactive floodplain management. Executive Order 24 (2018) directed the state to take a range of actions to plan for flooding and sea level rise, including developing a Virginia Coastal Resilience Master Plan and adopting an updated freeboard standard for state-owned properties. Executive Order 45 (2019) created the Virginia Flood Risk Management Standard which increased freeboard requirements for state-owned buildings in floodplains.

Implementation Actions:

i.	Conduct full inventory of county buildings and facilities to identify existing vulnerabilities to flooding, including public service buildings, shelters, community centers, and all other vulnerable county facilities. Build upon preliminary work conducted during the Resilient Fairfax planning process.
ii.	Review current processes for internal county reporting of flooding issues and/or damage to county buildings to ensure small-scale repetitive flooding is captured along with larger flooding events and impacts. This process review should include review of the EDGR system in coordination with DEMS. Clarify roles, responsibilities, and standard procedures for submitting damage reports. Identify opportunities to streamline submittals, consolidate reporting into one database, and improve consistency of data collection and reporting.
iii.	Share and educate staff to provide enhanced awareness of and familiarity with reporting systems such as EDGR.
iv.	Prioritize buildings and facilities for flood resilience retrofits based on level of risk and type of flooding/damage.
v.	For flood mitigation relevant to DPWES, establish regular coordination between DPWES and county entities responsible for operating potentially flood-prone community centers, athletic facilities, and other public service facilities. Such entities should include but not be limited to NCS, FCPA, and DFS.
vi.	Incorporate findings into FMD's facility improvement processes, for facility improvements relevant to FMD. Inventory county buildings and facilities at future risk of climate change.

Key Performance Indicators:
Outcome: Completion of County Building Inventory. Updated reporting process.

- *Updated and/or expanded reporting system to ensure inclusion of facility issues that are currently underreported*
- *Number (#) of staff trained on EDGR/reporting system*
- *Number (#) of facility improvements completed*
- *Number (#) of county buildings retrofitted*

Equitable Implementation:

✓ Consider critical services to vulnerable populations.

How to Equitably Implement:

✓ Insert a prioritization factor that uses demographics of the community. Low-income neighborhoods may be more reliant on community centers and improving the accessibility for critical infrastructure will be instrumental.

Funding Opportunities:

- *Hazard Mitigation Grant Program (HMGP)*
- *Flood Mitigation Assistance Grant*

Co-Benefits:

ADDITIONAL STRATEGIES FOR GOAL RIB.1

Strategy RIB.1c	**Enhance Energy Resilience for County Buildings and Facilities** Enhance the energy resilience of county-owned facilities, particularly new facilities, by increasing the availability of on-site back-up power, prioritizing clean power when feasible.
Strategy RIB.1d	**Enhance Heat Resilience for County Buildings and Facilities** Modify the county's capital facility renewal plan to include consideration of heat mitigation retrofits to county facilities such as shading, sufficient ventilation, cool roofs, or passive cooling, for new or renovated county buildings.
Strategy RIB.1e	**Update A/E Procurement** Project scopes procurement should maximize the inclusion of construction methods and design elements that maximize resiliency, such as porous material installation, green infrastructure implementation, wetland restoration, and solar plus storage design and construction.

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Goal RIB.2 Advocate for Infrastructure Resilience Outside of County Control

STRATEGY RIB.2a Advocate and Partner for Energy Resilience.

Strategy Description: Energy infrastructure (i.e., the electricity grid and natural gas infrastructure systems) can be affected by climate change impacts, including extreme storms, flooding, and heat, all of which can cause service disruptions and cascading effects across many sectors. Power outage impacts were identified as a top risk in the Resilient Fairfax Vulnerability and Risk Assessment. While Fairfax County has limited ability to directly address energy infrastructure, opportunities have been identified for Fairfax County to continue and expand engagement and coordination with energy utilities, including Dominion Energy and NOVEC. Fairfax County can also promote energy resilience enhancements by developing an Energy Assurance Plan, which would consider a community's energy profile, providers, and critical facilities. Through advocacy and partnership, Fairfax County can support greater energy resilience for the community, helping to limit energy disruption and improve energy reliability.

Climate Hazards Addressed:

Lead:	OEEC
Partners:	DEI, DEMS, DPD, DPSC, OCA
Timeline:	Ongoing
Cost:	$$$ ($500k - 1 million)

Implementation Actions:

i.	Identify opportunities for implementation of distributed energy resources, such as renewables, back-up power, and energy storage. Identify priority locations for siting distributed energy resources, with consideration for vulnerable populations, community serving facilities, emergency operation centers, and other critical facilities. As use of distributed energy matures, monitor the community for opportunities for microgrid applications for greater redundancy.
ii.	Continue coordination with energy utilities, including Dominion Energy, NOVEC, Washington Gas, and Columbia Gas, to support consideration of climate hazards in new and/or upgraded energy infrastructure, and to advocate for continued energy resilience enhancements.
iii.	Coordinate with the State Corporation Commission to support state efforts to improve energy resilience through distributed energy resources, improved grid reliability, and islanding capabilities while maintaining energy affordability.
iv.	Evaluate options for development of an Energy Assurance Plan, either at the county or state level, to enhance preparedness for climate hazard events and improve energy resilience.

Key Performance Indicators:
Outcome: Completion of County Building Inventory. Updated reporting process.

- *Number (#) of coordination meetings with utilities and/or state regulators*
- *Number (#) of identified locations for Distributed Energy Resources*

Equitable Implementation:

- ✓ Consider which programs and policies would best support needs of vulnerable communities and ensure access to energy during climate change related impacts.
- ✓ Consider how to best advocate for all residents, especially vulnerable communities.

How to Equitably Implement:

- ✓ Ensure that the Energy Assurance Plan considers energy needs of the most vulnerable populations.
- ✓ Prioritize implementation of renewables, and storage in low-income communities.
- ✓ Consider funding options to support upfront costs to vulnerable communities in the future.

Funding Opportunities:

(For future energy resilience projects):

- *BRIC*
- *Community Development Block Grant State Program*

Co-Benefits:

What are distributed energy resources?

Distributed energy resources (DER) are small scale electricity generation and storage technologies that provide energy capacity where needed. DER systems are typically less than 10 megawatts of power and can be either connected to the local power grid or stand alone from the power grid. DER includes a range of technologies such as wind turbines, solar photovoltaics, natural gas generators, battery energy storage, and fuel cells.

ADDITIONAL STRATEGIES FOR GOAL RIB.2

Strategy RIB.2b	**Advocate for Resilience Updates to the Building Code** Continue advocating for updates to the Virginia Statewide Building Code to enhance resilience to climate hazards for new buildings.
Strategy RIB.2c	**Advocate and Partner with Transportation Agencies to Support Transportation Resilience** Support transportation infrastructure managers such as WMATA, VDOT, FCDOT and others to advocate for climate adaptive measures for transportation infrastructure, including roadways and public transit. Resilience measures may include flood mitigation upgrades, energy resilience retrofits, shaded transit stops, green bus stops, seating, cool pavements, or alternate paving materials.

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Pillar 4: Adaptive Environments (AE):

The Adaptive Environments pillar focuses on protection and restoration of the county's natural environments. Adaptive Environments improve the county's overall resilience to climate impacts by supporting ecosystems' ability to naturally mitigate risks and provide ecosystem services. When ecosystems are healthy and protected, they are better able to provide critical services that support county-wide resilience. For example, wetlands, thriving stream valley parks, and green infrastructure are able to naturally absorb excess flood waters. Living shorelines are able to naturally absorb coastal storm surge energy along the Potomac, providing protection to the communities behind the shores. Tree canopies and green spaces provide a localized cooling effect from heat through shade and evapotranspiration.

Adaptive Environments in Fairfax include:

- Green infrastructure that enhances neighborhood resilience to flooding and heat
- Natural resources and environments that are thriving, accessible to the public, and able to provide ecosystem services and natural resilience
- Environmentally sensitive areas that are protected and conserved
- Natural resources planning that considers future climate conditions

AE	Adaptive Environments Strategies:
Goal AE1: Protection of Natural Resources	**Goal AE2:** Restoration of Natural Resources
AE.1a: Develop a Consolidated Natural Resources Management Plan AE.1b: Pursue Partnerships and Financing to Conserve and Protect Environmentally Sensitive Areas	AE.2a: Pursue Green Infrastructure Projects that Provide Climate Resilience Benefits
Additional Strategies: ▪ AE.1c: Update Requirements for Conservation Easement ▪ AE.1d: Integrate Climate Change Considerations into Urban Forestry Program	*Additional Strategies:* ▪ AE.2b: Support Continued Stream Corridor Restoration ▪ AE.2c: Support Urban Reforestation ▪ AE.2d: Explore Living Shoreline Opportunities ▪ AE.2e: Restore Wetlands and Floodplains ▪ AE.2f: Explore Regenerative Agriculture Opportunities

Goal AE.1 Protection: Protect Natural Resources That Enhance Resilience

STRATEGY AE.1a Develop a Consolidated Natural Resources Management Plan.

Strategy Description: A consolidated natural resources management plan will allow the county to more comprehensively plan for and manage its numerous natural resources, including tree canopies and forests, parkland and conserved land, stream corridors and valleys, water bodies, shorelines, wetlands, green infrastructure, critical habitats, and other natural resources. Currently, these natural resources are managed and planned in numerous separate processes and programs, which renders it difficult for the county to manage our natural resources as an interconnected, integrated, and overarching system. Climate change impacts, such as changing precipitation patterns and increasing temperatures, will affect ecological systems' integrity and ability to provide ecosystem services. A comprehensive natural resources management plan will enable the county to plan with a systems-level approach, include climate change projections into planning and management decisions, and identify needed measures to improve ecosystem resilience. This strategy will fold together the county's existing natural resource management related plans, including those managed by DPD, FCPA, NVSWCD, DPWES Urban Forestry Division, and other applicable departments. The natural resources management plan should cover all of Fairfax's natural assets, consider climate change impacts to the resources, identify measures to mitigate risk, and develop management actions to increase resource resilience. The natural resources management plan will provide clear guidance to county staff that manage natural resource assets. Guidance from the natural resources management plan should be integrated into other county plans and ordinances to facilitate implementation.

Climate Hazards Addressed:

Lead:	FCPA, NVSWCD
Partners:	DPD, DPWES, OEEC, One Fairfax, UFMD
Timeline:	Medium-Term (2-5 years)
Cost:	$$$ ($500k - 1 million)

Implementation Actions:

i.	Following authorization by applicable Boards (Board of Supervisors, Park Authority Board, and NVSWCD Board), create a working group inclusive of all county departments and entities that oversee and manage the existing natural resource plans.
ii.	Identify applicable existing natural resource-related plans that should be consolidated into and updated through the consolidated Natural Resources Management Plan. Identify also new sections that should be added, such as a Shoreline Management Plan.
iii.	Create a work plan for creation of the Natural Resource Management Plan, including schedule, tasks, responsibilities (including leads for each section), coordination system, budget, etc.
iv.	Develop draft consolidated Natural Resource Management Plan that folds together existing county natural resource management plans, incorporates climate change projections and consideration for climate change impacts, and identifies measures needed to protect and enhance ecosystem resilience.
v.	Lead and partner agencies will bring draft plan forward through the public hearing process, including outreach and public hearings. The plan will then be brought to the Board for consideration.

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Key Performance Indicators:

- *Development of a natural resource management plan working group.*
- *Completion of a draft natural resource management plan*

Equitable Implementation:

- ✓ Well-meaning regulations can have negative unintended consequences on certain populations. Consider if measures identified in the natural resource management plan could negatively impact vulnerable communities and identify ways to ensure vulnerable populations are able to enjoy benefits provided by natural areas.

How to Equitably Implement:

- ✓ Consider access to natural areas for low-income neighborhoods so the ecosystems benefits that come from these areas are equitably distributed.
- ✓ Leverage the Inclusive Community Engagement Framework for community outreach during plan development

Funding Opportunities:

- *BRIC*
- *National Fish and Wildlife Foundation*
- *Small Watershed Grants Planning and Technical Assistance*

Co-Benefits:

Tree Planting:
Fairfax County's tree canopy covers more than 50% of the county. To protect and maintain this tree canopy cover, the county supports numerous tree preservation, management, and planting programs. For example, the Fairfax County Urban Forest Management Division ensure the vitality of the urban forest through development plan review to maximize opportunities to preserve trees, pest management to detect threats to the County's urban forests, and through public outreach to foster awareness and support for tree planting and preservation. UFMD also has a pilot program with Casey Trees to plant trees on residential properties in vulnerable neighborhoods, as identified by the One Fairfax Vulnerability Index. Additional tree planting initiatives, seedling sales, and assistance are provided by Fairfax County Park Authority (FCPA) and Northern Virginia Soil and Water Conservation District (NVSWCD), among others.

Goal AE.1 Protection: Protect Natural Resources That Enhance Resilience

STRATEGY AE.1b Pursue Partnerships and Financing to Conserve and Protect Environmentally Sensitive Areas.

Strategy Description: Protection of environmentally sensitive areas will be critical to the long-term resilience of Fairfax County. This strategy refers to "environmentally sensitive areas" as a broad term that extends beyond the county's current regulatory definition of official "ESAs". This strategy should be used to financially implement guidance formed through Strategy AE 1.a, the consolidated natural resource management plan. Healthy environmentally sensitive areas, such as critical habitats and biodiverse land, wetlands, natural shorelines, and stream corridors, can reduce climate risks and enhance county resilience by serving as natural barriers against severe storms, absorbing excess flood waters and storm surge energy, protecting downstream communities, and mitigating extreme heat, among other benefits. Environmentally sensitive areas can also provide climate resilience benefits by supporting biodiversity of ecosystems, which is increasingly threatened by climate change. Environmentally sensitive areas provide critical habitat to plants and animals. Environmentally sensitive areas also provide many additional benefits, such as water quality protection and protection of areas with intrinsic values due to historical or archeological significance. Implementation of this strategy should include exploration and pursual of strategic partnership and/or financing opportunities to enhance conservation and protection of natural areas.

Climate Hazards Addressed:

Lead:	FCPA, NVSWCD
Partners:	DPD, DPWES, OCA, OEEC, FCDOT, UFMD
Timeline:	Long-Term (5-8 years)
Cost:	$$$ ($500k - 1 million)

Implementation Actions:

i.	Identify and secure additional staff capacity and/or consultant support needed to support implementation of the strategy.
ii.	Leverage the Consolidated Natural Resources Management Plan (Strategy AE1.a) and other applicable plans as a starting point for identification of environmentally sensitive areas that could be candidates for more stringent protection. To thoroughly analyze these candidate areas, complete field surveys of public land to verify and document sensitive and/or rare habitat and species. Consider leveraging existing GIS data, such as tree canopy cover and land use type, to inform field survey work. Partner with state and federal agencies, as applicable, to coordinate survey work and data collection. Build off of existing survey work from FCPA and past work from NVRC.
iii.	Informed by data collection under this strategy as well as available county data, create an updated GIS database of environmentally sensitive areas, including lands with sensitive and/or rare habitat and species and high-quality natural resources areas.
iv.	Based upon field survey and developed GIS database, identify land prioritized for conservation easements, Natural Area Preserve designation, or other protective status based on presence of more sensitive and/or critical species.
v.	Explore strategic partnerships, grant opportunities and/or financing opportunities for conservation and protection of identified environmentally sensitive areas, including but not limited to: tidal and freshwater wetlands, intermittent streams, shorelines, and habitat for key species. Partners in this effort may include, but are not limited to: Department of Defense, National Parks Service, Northern Virginia Regional Parks, Northern Virginia Conservation Trust, and Virginia Department of Conservation and Recreation.

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Adaptive Environments Implementation Roadmaps

Key Performance Indicators:

- *Number (#) of field surveys completed*
- *Amount ($) secured in grant or other funding source for conservation*
- *Acres of ESA conserved and/or protected*

Equitable Implementation:

- ✓ Consider how the protection of environmentally sensitive areas could affect development and/or change land values.
- ✓ Consider whether the benefits of protecting environmentally sensitive areas will be distributed equitably.

How to Equitably Implement:

- ✓ Along with protecting environmentally sensitive areas, include aspects of environmental restoration in low-income neighborhoods so the benefits that come from these ecosystems are equitably distributed.

Funding Opportunities:

- *BRIC*
- *Coastal and Estuarine Land Conservation Program*
- *Conservation Reserve Enhancement Program*
- *Emergency Coastal Resilience Fund*
- *Land and Water Conservation Fund*
- *National Coastal Resilience Fund*
- *National Coastal Wetlands Conservation Grant Program*
- *Virginia Environmental Endowment Wildlife Conservation Society Climate Adaptation Fund*
- *Virginia Land Conservation Fund*
- *Virginia Open Space Lands Preservation Trust Fund*
- *Virginia Recreational Trails Fund*

Co-Benefits:

Dyke Marsh Wildlife Preserve Restoration
Dyke Marsh is the Washington metropolitan region's largest freshwater wetland and one of the best studied wetlands in the nation. Located in Fairfax County, the marsh is home to 300 different plant species including six species of concern. The marsh began growing 2,500 years ago. During the 20th century, over 100 acres of the marsh was dredged away for mining of sand and gravel. Erosion and sea level rise pose additional threats. The USACE and NPS have been working on Dyke Marsh stabilization. Phase I is complete, and Phase II is scheduled to start summer 2022. Restoration and stabilization of marshes like Dyke Marsh not only provide critical habitat for a variety of wildlife, but also provide storm buffers, helping to reduce wave energy and prevent erosion. Additionally, our marshes act as natural filters to clean the waters of the Potomac River.

ADDITIONAL STRATEGIES FOR GOAL AE.1

Strategy AE.1c	**Update Requirements for Conservation Easement** Update current requirements for conservation easements that grant a canopy and/or nutrient credit to include preparation, funding, and implementation of a forest conservation plan or improve the condition of the resource in perpetuity.
Strategy AE.1d	**Integrate Climate Change Considerations into Urban Forestry Program** Consider future climate conditions to support long term tree health, including consideration for tree selection, required maintenance, and planting processes.

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Goal AE.2

Restoration: Restore Damaged Areas Through Nature-Based and Natural Solutions

STRATEGY AE.2a

Pursue Green Infrastructure Projects That Provide Climate Resilience Benefits.

Strategy Description: "Green infrastructure" refers to systems that use a combination of ecologically-based and engineered solutions to support heat mitigation, water quality, stormwater management, and numerous other co-benefits. Green infrastructure can include a range of systems from structural projects, such as bioretention ponds, bioswales, permeable pavements, and green roofs, to non-structural green infrastructures, such as land conservation, floodable parks, and green spaces. This strategy focuses primarily on structural green infrastructure projects. Strategic location and implementation of green infrastructure projects can support the county's broader flood mitigation efforts through localized retention of stormwater, as well as providing localized cooling and other community benefits. While Fairfax County does not have a formal green infrastructure plan, the county has numerous initiatives, pilots, and policies that relate to the goals of green infrastructure. This strategy would expand upon existing efforts to support implementation of green infrastructure for resilience benefits.

Climate Hazards Addressed:

Lead:	FCDOT, DPWES, NVSWCD
Partners:	DCC, DPD, FCPA, FCPS, LDS, OEEC, UFMD
Timeline:	Medium-Term (2-5 years)
Cost:	$$$ ($500k - 1 million)

Implementation Actions:

i.	Identify areas that are: heat vulnerable, flood-prone, and/or areas where green infrastructure would provide additional community and resilience benefits.
ii.	Integrate structural green infrastructure projects into county CIP process and support prioritization of green infrastructure projects in identified areas. Prioritize native plants when feasible and effective.
iii.	Explore policies to support green infrastructure implementation, including but not limited to: incentive programs, de-paving neighborhood targets, and stormwater service fee credits.
iv.	Develop and promote guidance for small-scale green infrastructure projects, such as tree plantings or rain gardens, that can be implemented on-site by local businesses, Commercial and Industrial properties, and homeowners to support heat mitigation, local retention of stormwater, and other resilience benefits. Promote and expand awareness of existing green infrastructure programs, workshops, and assistance provided by NVSWCD.
v.	Support community greening programs to encourage reduction of impervious spaces and expansion of green spaces in communities, prioritizing native plants when feasible and effective. Develop maintenance programs for green spaces. Engage with community groups, volunteers, and students.

Key Performance Indicators:
Outcome: Establish new policy/incentive for private development implementation of green infrastructure

- *Completion of green infrastructure guidance document.*
- *Number (#) of new small-scale green infrastructure (private development, by type)*
- *Number (#) of CIP projects with green infrastructure component (public projects, by type)*
- *Number (#) of tree plantings (by location, e.g., street trees, urban forest, open space)*

Equitable Implementation:

Equity Considerations:

- ✓ Consider how these green infrastructure projects affect surrounding neighborhoods and how residents, particularly low-income, can benefit from the incentive program and meaningfully participate in community greening projects.

How to Equitably Implement:

- ✓ Include a maintenance program for green infrastructure installations to ensure proper drainage and that the amenity does not attract/collect litter or dumping, which can affect the values of surrounding properties.
- ✓ Teach the community about the benefits of green infrastructure and provide tools necessary to participate at an individual level.
- ✓ Include a community education component to involve stewards that can address continued use of green infrastructure installations.
- ✓ Incorporate community input to decide the locations of the green infrastructure projects.
- ✓ Set up programs that subsidize measures to alleviate flood risks following heavy rainfall. Incorporate an educational component and localized participation in rain capture practices (rain barrels, downspout planters, etc.).
- ✓ Add stormwater service fee credit potential to promote potential savings using the program.

Funding Opportunities:

- *BRIC*
- *HMGP*
- *Flood Mitigation Assistance Grant*
- *Virginia Community Flood Preparedness Fund*
- *Healthy Streets Program*

Co-Benefits:

Case Study: Green Infrastructure
A study of social and economic benefits of green infrastructure (GI) in 12 cities across the United States as well as international cities, including Copenhagen Adelaide, Toronto, and Tokyo, confirmed many of the co-benefits provided by GI beyond stormwater mitigation. The study found that GI helped to lower heat stress, heat stroke, and heat-related deaths. Through implementation of GI, the creation of new green spaces in communities improved community livability, providing recreation opportunities, encouraging walkability, and other outdoor activities. GI also supported air quality improvement through improved filtering of the air by vegetation and lower energy consumption in buildings with GI implementation. Many Fairfax County government buildings incorporate green infrastructure, such as the Public Safety Headquarters which has a suite of green infrastructure including a vegetated roof, rain garden, and pervious pavement, among others.

ADDITIONAL STRATEGIES FOR GOAL AE.2

Strategy AE.2b	**Support Continued Stream Corridor Restoration** Continue and expand the county's stream corridor restoration opportunities, leveraging best available science and best practices in habitat restoration.
Strategy AE.2c	**Support Continued Urban Reforestation** Aid with urban heat island effect and flooding impacts through urban reforestation projects, expanding upon existing initiatives by the Urban Forestry Management Division.
Strategy AE.2d	**Explore Living Shoreline Opportunities** Aid in coastal flooding risks through living shorelines projects. Pursue potential development of a Shoreline Management Plan, as a component of the Consolidated Natural Resources Management Plan. Leverage existing living shorelines pilot projects for educational purposes.
Strategy AE.2e	**Restore Wetlands and Floodplains** Aid in flooding risk through wetland and floodplain restoration.
Strategy AE.2f	**Explore Regenerative Agriculture Opportunities** Aid in agricultural resilience to climate hazards.

Case Study: Living Shoreline

The Leesylvania State Park Living Shoreline Project was a collaborative effort between Prince William County, NVRC, the Virginia Department of Conservation and Recreation, Leesylvania State Park, Dominion Power, and the Virginia Institute of Marine Science. Completed in 2016, the project includes 800 linear feet of stabilized shorelines and 25,000 square feet of restored inter-tidal marsh and beach habitat. The project utilizes various living shoreline practices such as marsh restoration, beach enhancement, and sills to promote shoreline and habitat protection while maintaining recreational access.[ix] Living shorelines are a nature-based approach to address climate risk due to sea level rise.

What are nature-based solutions?

Nature based solutions are "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (IUCN). Nature-based solutions can include ecosystem restoration (wetlands restoration), infrastructure related approaches (green infrastructure), ecosystem management approaches (water resources management), or ecosystem protection approaches (land conservation).

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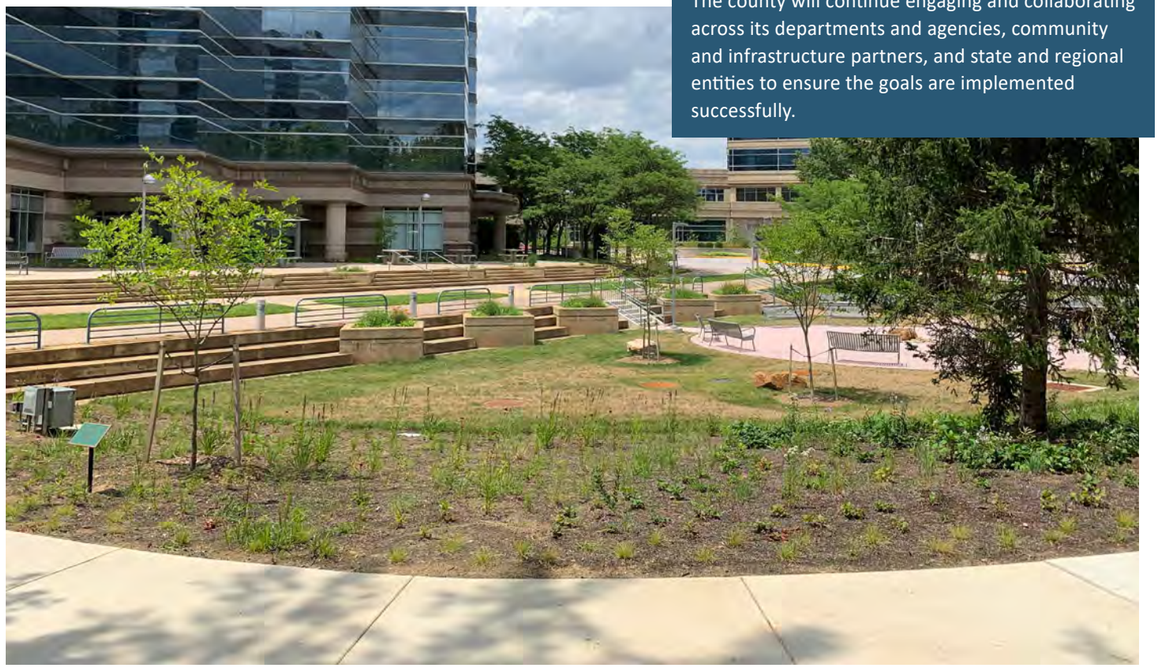
The climate crisis poses real, potentially catastrophic, threats to the county's residents, infrastructure, and services. Preparing for and adapting to climate change takes hard work, dedicated leadership, and meaningful engagement from community members and infrastructure partners. Despite the significant challenges ahead, Fairfax County is prepared to answer the call. By taking action now, the county reduces risk and minimizes costs in the long run. The adaptation and resilience goals outlined in this Plan offer opportunities for the county to become a stronger, more resilient, and climate-ready place to live for all its residents.

This first Resilient Fairfax plan represents the county's first step in enhancing climate resilience and addressing vulnerabilities. It is the intention of the county that Resilient Fairfax will continue as an ongoing program, with periodic updates, learning, engagement, and monitoring and evaluation of implementation. As the state of science advances, technologies mature, and successes and shortcomings are identified through Resilient Fairfax, the strategies may evolve to fit the emerging needs and best practices.

It takes a village!

The county will continue engaging and collaborating across its departments and agencies, community and infrastructure partners, and state and regional entities to ensure the goals are implemented successfully.



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Appendix A: Glossary

(Based on U.S. Climate Resilience Toolkit)

Adaptation: The process of adjusting to new (climate) conditions in order to reduce risks to valued assets.

Adaptive capacity: The ability of a person, asset, or system to adjust to a hazard, take advantage of new opportunities, or cope with change.

Assets: People, resources, ecosystems, infrastructure, and the services they provide. Assets are the tangible and intangible things people or communities value.

Climate Change: Changes in average weather conditions that persist over multiple decades or longer.

Climate Projections: Simulated response of the climate system to a scenario of future emissions derived from climate models.

Climate shock: A sudden condition or event that is high impact with a limited duration and that can increase vulnerability of a system

Climate stressor: A condition, event, or trend related to climate variability and change that can exacerbate hazards.

Co-benefits: Positive secondary benefits in addition to climate risk mitigation provided by strategy implementation that improve overall resilience of Fairfax.

Consequence: A subsequent result (usually negative) that follows from damage to or loss of an asset. Quantifying potential consequences is an important part of determining risk.

Drought: Based on the meteorological drought, "drought" is the degree of dryness or rainfall deficit and the length of the dry period. Hydrologic drought is based on the impact of rainfall deficits on the water supply such as stream flow, reservoirs and lake levels, and ground water table.

Ecosystem services: Benefits that humans receive from natural systems, such as climate regulation, water purification, nutrient cycling, among others.

Equity: The commitment to promote fairness and justice in the formation of public policy that results in all residents – regardless of age, race, color, sex, sexual orientation, gender identity, religion, national origin, marital status, disability, socio-economic status or neighborhood of residence or other characteristics – having opportunity to fully participate in the region's economic vitality, contribute to its readiness for the future, and connect to its assets and resources.

Exposure: The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.

Greenhouse gases (GHGs): Gases that trap heat in the atmosphere, contributing to global warming and climate change. Common GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N20), and fluorinated gases.

Greenhouse gas reductions: Decreases in the emissions of heat-trapping greenhouse gases into the atmosphere.

Hazard: An event or condition that may cause injury, illness, harm, or death to people, unsafe conditions, damage to assets and systems, and/or impact on services.

Impacts: Effects on natural and human systems that result from hazards. Evaluating potential impacts is a critical step in assessing vulnerability.

Implementation Partners: Implementation partners include other county departments as well as key public, private, and/or nonprofit organization that will support implementation and strategy success.

Implementation Actions: Specified set of activities developed to carry out a climate adaptation and resilience strategy.

Key Performance Indicators: Quantitative metrics that can help measure progress and success of strategy implementation.

Lead: County department that will oversee strategy implementation.

Mitigation: Processes that can reduce the amount

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Appendix B

and speed of future climate change by reducing emissions of heat-trapping gases or removing them from the atmosphere.

Probability: The likelihood of hazard events occurring. Probabilities have traditionally been determined from the historic frequency of events. With changing climate and the introduction of non-climate stressors, the probability of hazard events also changes.

Projections: Potential future climate conditions calculated by computer-based models of the Earth system. Projections are based on sets of assumptions about the future (scenarios) that may or may not be realized.

Renewable energy: Energy generated from renewable, non-fossil fuel sources such as solar and wind.

Representative Concentration Pathways (RCPs): Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases, aerosols, and other chemical active gases, as well as land use/land cover. The word "representative" signifies that each RCP provides only one of many possible scenarios that would lead to the specific radiative forcing characteristics. The term "pathway" emphasizes that not only the long-term concentration levels are of interest, but also the trajectory taken over time to reach that outcome. Emissions scenarios are labeled as “RCP” followed by a number, such as RCP 2.5, RCP 4.5, RCP 6.0, and RCP 8.5. The numbers refer to the warming (in watts) per square meter across the planet by the end of century. For example, “RCP 8.5” means the emissions scenario where the concentration of carbon results in warming at an average of 8.5 watts per square meter over the planet in 2100.

Resilience: The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.

Risk: The potential for negative consequences where something of value is at stake. In the context of the assessment of climate impacts, the term risk is often used to refer to the potential for adverse consequences of a climate-related hazard. Risk can be assessed by multiplying the probability of a hazard by the magnitude of the negative consequence or loss.

Sea Level Rise: Increase in the average long-term global rise of the world’s sea level due to global warming.

Sensitivity: The degree to which a system, population, or resource is or might be affected by hazards.

Strategy: A broader set of actions or set of subsector work that can be modeled to understand GHG emissions reductions.

Strategy Description: Description of the strategy, including context for how it connects to existing county plans, policies, or programs, how the strategy addresses climate risk, and/or how the strategy improves Fairfax’s resilience.

Storm Surge: The sea height during storms such as hurricanes and tropical storms that is above the normal level expected at that time and place based on the tides alone.

Tropical Cyclones: Low pressure system (not associated with a front) that develops over tropical and sometimes sub-tropical waters and has organized deep convection with a closed wind circulation about a well-defined center. Tropical depression, tropical storms, and hurricanes are all examples of tropical cyclones.

Uncertainty: A state of incomplete knowledge. Uncertainty about future climate arises from the complexity of the climate system and the ability of models to represent it, as well as the inability to predict the decisions that society will make.

Urban Heat Island Effect (UHI): The tendency for higher air temperatures to persist in urban areas because of heat absorbed and emitted by buildings and asphalt, tending to make urbanized areas warmer than the areas with ample green space.

Vulnerability: The propensity or predisposition of assets to be adversely affected by hazards. Vulnerability encompasses exposure, sensitivity, potential impacts, and adaptive capacity.

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Appendix B: Strategies X Top Risk Summary Table

RESILIENT FAIRFAX STRATEGIES X TOP RISKS		Heavy Precipitation Causing Inland Flooding of Communities	Combined Stress on Natural Systems	Severe Storms and Wind Causing Vulnerabilities Due to Debris, Damage, and Unsafe Conditions	Severe Storms and Wind Causing Vulnerabilities due to Power Outages	Extreme Heat Causing Health Related Impacts	Coastal Flooding Impacts
Goal IAP.1 | General Planning: Integrate Climate Resiliency into Countywide General Planning.	Strategy IAP.1a | Inventory and Update the Comprehensive Plan to Enhance Resilience.	X	X	X	X	X	X
Goal IAP.2 | Data Collection: Coordinate and Enhance Data Collection to Inform Resilient Fairfax Implementation	Strategy IAP.2a | Develop Resilience Metrics and A Tracking System for Ongoing Assessment of Community Resilience and Improvements.	X	X	X	X	X	X
Goal IAP.3 | Funding: Obtain and Track Funding for Successful Resilient Fairfax Implementation.	Strategy IAP.3a | Develop a County Climate Fund.	X	X	X	X	X	X
	Strategy IAP.3b | Pursue Federal and State Funding Opportunities.	X	X	X	X	X	X
Goal IAP.4 | Interagency coordination: Enable Continued Interagency and Intergovernmental Collaboration on Climate Resilience.	Strategy IAP.4a | Establish a Long-Term Interagency Collaboration System.	X	X	X	X	X	X
Goal RIB.1 | County Infrastructure Decisions: Incorporate Climate Projections and Resilience into County Infrastructure Decisions.	Strategy RIB.1a | Update Capital Improvement Program Process to Include Climate Resilience Considerations.	X	X	X	X	X	X
	Strategy RIB.1b | Enhance Flood Resilience of County Buildings and Other Facilities.	X					
Goal RIB.2 | Advocate for Infrastructure Resilience Outside of County Control.	Strategy RIB.2a | Advocate and Partner for Energy Resilience.				X	X	
Goal CRC.1 | Create Safe and Resilient Spaces for The Community.	Strategy CRC.1a | Pursue Development of a Network Of Resilience Hubs In Climate-Vulnerable Areas Of The County.	X		X	X	X	X
	Strategy CRC.1b | Develop Adaptation Action Areas Where Resilience Action Is Prioritized.	X	X	X	X	X	X
Goal CRC.2 | Build Community Capacity to Understand, Be Ready For, Respond To, And Bounce Back from Climate Change Impacts.	Strategy CRC.2a | Provide Community Aid and Engagement to Identify and Alleviate Resilience Needs.	X		X	X	X	X
Goal CRC.3| Integrate Climate Hazard and Resilience Considerations into Development Regulations, Processes, And Retrofits.	Strategy CRC.3a | Pursue and Implement a Flood-Risk Reduction Plan for The Fairfax County Community.	X	X	X			X
	Strategy CRC.3b | Propose County Incentive and Assistance Programs That Reduce Heat-Related Climate Risk.					X	
Goal AE.1 | Protection: Protect Natural Resources That Enhance Resilience.	Strategy AE1.a | Develop a Consolidated Natural Resources Management Plan.	X	X			X	X
Goal AE.1 | Protection: Protect Natural Resources That Enhance Resilience.	Strategy AE1.b | Pursue Partnerships and Financing to Conserve And Protect Environmentally Sensitive Areas.		X			X	X
Goal AE.2| Restoration: Restore Damaged Areas Through Nature-Based and Natural Solutions	Strategy AE.2a | Pursue Green Infrastructure Projects That Provide Climate Resilience Benefits.	X	X			X	X