REGIONAL CLIMATE RESILIENCE STRATEGY

Moving Toward Resilience

The Regional Climate Resilience Strategy includes collaborative actions to support the region in achieving the climate resilience goals of becoming a Climate Ready Region and making significant progress to be a Climate Resilient Region by 2030. To move the region toward becoming more resilient, the region needs to ensure that all populations are included and prioritize resilience of the region's most vulnerable populations.

CLIMATE READY REGION BY 2030

Recognizing everything cannot be implemented at once due to the significant capital outlay required for resilience, the region first needs to be climate ready. To be Climate Ready by 2030, all local governments must assess current and future climate risks, and be actively integrating climate planning across government plans, operations, and communications. More specifically, Climate Ready involves metropolitan Washington undertaking five key components:

1. Local climate risks have been assessed and climate planning is incorporated into all government plans.
2. Climate risks are being communicated across governmental offices and to the public, with a particular emphasis on empowering diverse populations.
3. Climate planning is actively being incorporated into government operations.
4. All communities are implementing actions to reduce climate risks.
5. Establish the necessary plans, networks, funding, and other actions to ensure implementation of full resilience.

CLIMATE RESILIENT REGION

To fully be a Climate Resilient Region, the region must have the ability to adapt and absorb against disturbances caused by current and future, acute and chronic climate impacts and successfully maintain essential functions. This will be realized when:

1. The region is a network of resilient and socially connected people, governments, and institutions that have constructed resilient communities. (Resilient people = resilient communities).
2. Measures have been implemented across the region to mitigate against current and future climate impacts.
   - All critical infrastructure and functions are climate resilient.
   - Resilient solutions to protect public health and safety, particularly of potentially vulnerable populations, have been deployed.
3. The region is monitoring measures to address current and future climate risks and vulnerabilities.

PRIORITY COLLABORATIVE RESILIENCE ACTIONS

The climate action areas included in this Regional Climate Resilience Strategy address: Planning, Equity, and Resilient Infrastructure. Within these action areas are high-level priority actions for COG and its members to focus on through 2030. All actions are voluntary. Actions have a 1-page description that includes:

- An action overview with example policies, programs, or projects;
- How the action supports regional resilience goals;
- Identifies what level of implementation is needed to meet by 2030 and beyond;
- Examples of how COG and local jurisdiction efforts that can support implementation (it's not an exhaustive list); and
- How the action benefits other *Region Forward* goals.

Table 6 is a summary of the climate action areas and priority collaborative actions described in this strategy. The actions are based on the needs identified in the regional climate risk and vulnerabilities assessment described in the previous section of this plan. While these actions focus on what COG and its members can do together to move the region towards becoming Climate Ready and Climate Resilient, significant action will be needed across all sectors and all levels of government in order to meet these goals.

Table 6: Metropolitan Washington Priority Collaborative Resilience Actions

Climate Action Area	Action ID	Priority Collaborative Action
Planning	PL - 2	Support Capacity Building for Climate Resilience Planning
	PL - 3	Develop Integrated Approach to Climate Resilience Planning
	PL - 4	Update Local and Regional Plans to Address Climate Risks
Equity	EQ - 3	Support Engagement of the Public on Climate Risks, with a Particular Emphasis on Potentially Vulnerable Populations
	EQ - 4	Support Equitable Secure Energy Access
Resilient Infrastructure	RI - 1	Support Establishment of Resilience Hubs
	RI - 2	Improve the Resilience of Critical Infrastructure
	RI - 3	Implement Measures to Equitably Address Urban Heat Island
	RI - 4	Enhance Green Infrastructure Networks
	RI - 5	Implement Measures to Reduce Flood Risk

PL-2: SUPPORT CAPACITY BUILDING FOR CLIMATE RESILIENCE PLANNING

Action Overview

Metropolitan Washington is home to 24 diverse local jurisdictions that have unique capabilities, availability, and resources for climate resilience planning. To ensure an equitable climate resilient future, capacity building will require greater coordination, coherence, and integration. This is especially important to address climate hazards that have impacts that are felt across the region simultaneously. Communicating and capacity building will need to be mainstreamed across local government departments to achieve a common understanding of climate risks amongst all government staff.

To improve resiliency, the region's local governments need to continue to collaborative with a network of external organizations to support capacity building and training on climate resilience. One example effort is how COG coordinated from 2012 – 2014 with the National Aeronautics and Space Administration (NASA), National Capital Planning Commission (NCPC), US General Services Administration (GSA), US Global Change Research Program (GCRP), and the Smithsonian Institution to bring federal, regional and local agencies in the region together to learn about climate impacts, conduct and share agency-level vulnerabilities assessments, and identify common solutions.

Supporting A Climate Ready Region

The impacts of a changing climate are already evident in the region, with an increasing number of extreme heat days, change in precipitation patterns, and an increase in the severity of storms. Continuing to capacity build, provide training, and grow resilience expertise among government staff, non-governmental organizations, academic partners and the community is crucial to reaching climate readiness by 2030. Continuing to grow and identify avenues for integrated climate trainings and capacity-building resources, will support local level resiliency planning.

Level of Implementation Needed to Address Climate Risks

COG members participating regularly in capacity building on climate risks and resilience strategies will help the region be Climate Ready by 2030. This action addresses all climate risks including extreme heat, drought, flooding (flash, riverine, and coastal), lightning/ thunderstorms and extreme winter conditions.

How COG Can Support

- Continue to grow capacity building through workshops and committee meetings, and coordinate with members and partners to increase opportunities for training.
- Support implementation of a climate planning training series for local government staff.

How Member Jurisdictions Can Support

- Encourage active participation in climate planning training initiatives.
- Provide training and capacity-building across governmental departments and sectors to address climate risks and resiliency planning.

Region Forward Co-Benefits:

- **Equity and Education:** Jurisdictions with limited resources would benefit from capacity to increase regional knowledge of heightened climate impacts on vulnerable populations in the region.

PL-3: DEVELOP INTEGRATED APPROACH TO CLIMATE RESILIENCE PLANNING

Action Overview

Regional consensus on climate planning projections and climate resilience definitions, metrics and design standards will provide a common framework for resilience planning across the region. With 24 local governments located in two states and the District of Columbia, availability of funding and resources differs across the region. Many programs would benefit from sharing of climate materials that will assist in incorporating resilience in local and regional plans. Increasing regional collaboration will allow metropolitan Washington to pool resources that benefits local governments and the region to leverage expertise from a variety of climate planning sources.

To address climate risks, the coordination and sharing of activities, best practices, consistent forward-looking climate science, and technical resources to enhance local and regional capacity is essential. The region has substantial networks, notable examples collaborative work in the region include the District of Columbia's Silver Jackets, Northern Virginia Regional Commission's Resiliency Planning Work Group, and National Oceanic and Atmospheric Administration's Climate Resiliency Workgroup.

Supporting A Climate Ready Region

Reducing vulnerabilities to human life, infrastructure, ecosystems, and the economy require a collaborative response, as climate projections and impacts of extreme events cross jurisdictional boundaries. Adopting an integrated approach and consensus on climate projections, forward-looking climate science, and resilient design standards by the region will better align climate planning efforts.

Level of Implementation Needed to Address Climate Risks

Developing a regional consensus on climate projections and climate resilience definitions, metrics, and design standards is an important step towards becoming a Climate Ready Region by 2030. This action addresses all climate risks including extreme heat, drought, flooding (flash, riverine, and coastal), lightning/ thunderstorms and extreme winter conditions.

How COG Can Support

- Continue sharing of best practices with local governments, federal and state agencies, businesses, non-governmental organizations, and the academic community to address climate risks, planning, modeling, and standards development.
- Continue to identify avenues for shared contractual support for climate planning, feasibility, and implementation.
- Develop a regional consensus on projections on climate risks and definitions to use in planning.
- Develop regionally appropriate climate resilient design standard guidelines.

How Member Jurisdictions Can Support

- Provide expertise and sharing of best practices of resiliency planning.
- Integrate common climate projections, metrics and resilient design standards across all departments.
- Design new and rehabilitated infrastructure to meet future-looking climate conditions.

Region Forward Co-Benefits:

- **Equity and Education:** The region is a network of diverse local governments with various levels of resources and need. Growing climate networks and encouraging information sharing will assist in creating an equitable resilient future.

PL-4: UPDATE LOCAL AND REGIONAL PLANS TO ADDRESS CLIMATE RISKS

Action Overview

Climate projections in metropolitan Washington show more frequent and severe weather events will occur, which can lead to larger disruption of critical services and increased threat to human life. To ensure the region is prepared for climate-related disasters and possesses the ability to recover quickly, climate projections, risks and actions to reduce risks to potentially vulnerable populations need to be mainstreamed into all government plans, including but not limited to emergency plans, hazard mitigation plans, comprehensive plans, transportation plans, stormwater and watershed plans, and capital improvement plans. Mainstreaming occurs when climate considerations are a part of the overall planning process rather than outliers not central to policy and investment decisions.[cxxxv]

In 2017, Prince George's County adopted an updated Hazard Mitigation Plan to incorporate climate planning data. Within the plan's flood-related hazard analyses, a variety of climate data was used including data from the Maryland Department of Natural Resources Coast Smart program. The Coast Smart Flood Hazard Analysis of sea level rise on the Potomac and Patuxent Rivers was used to conduct a coastal flooding analysis and to map potential sea level rise.[cxxxvi]

Supporting A Climate Ready Region

The climate is changing, and all government departments will need to have the ability to anticipate, address, and adapt to new and changing climate risks in order to reduce impacts on people, critical services, infrastructure, and the economy. All government offices need to understand how climate risks and impacts affect their ability to do their job and continue to provide services to the community.

Level of Implementation Needed to Address Climate Risks

To become a Climate Ready Region by 2030, COG and its members will need to update all plans to address climate risks. This action addresses all climate risks including extreme heat, drought, flooding (flash, riverine, and coastal), lightning/ thunderstorms and extreme winter conditions.

How COG Can Support

- Review and update regional emergency response and other relevant plans to reflect climate-risks and projections.
- Incorporate future climate projections and risks into regional emergency response exercises.
- Host a training series on how to incorporate resilience into all types of government plans. Develop toolkit(s), where appropriate.

How Member Jurisdictions Can Support

- Incorporate climate projections and climate risks into emergency and other government plans.
- Actively reach out to ensure participation by vulnerable groups in disaster preparedness, response, and recovery programs.
- Assess long-term energy resilience planning into energy and other plans and guidelines.
- Update zoning, building codes, ordinances, and the development review process to ensure new development is more resilient to forward-looking local climate impacts.

Region Forward Co-Benefits:

- **Public Safety and Equity:** Integrating climate strategies with emergency preparedness will enhance region's ability to prepare for and recover from disasters and meet the needs of the most vulnerable populations.
- **Economy:** Integrating climate projections into emergency plans can reduce economic damages from disasters.

EQ-3: SUPPORT ENGAGEMENT OF THE PUBLIC ON CLIMATE RISKS, WITH AN EMPHASIS ON POTENTIALLY VULNERABLE POPULATIONS

Action Overview

Metropolitan Washington is at risk to a range of threats - extreme heat, flooding, winter storms, drought, and lightning and thunderstorms. Engaging local communities to discuss climate risks and solutions is an important step to achieving common understanding of climate risks and enhancing the resilience of local communities and its people. Potentially vulnerable populations face a heightened risk to climate change while simultaneously can be the hardest groups to reach. Therefore, emphasis must be taken to strengthen engagement initiatives to these communities.

Montgomery County's Resilience Ambassador Program was established in 2020 to further understand and improve solutions around inequality within the county's transportation, equity, climate, energy justice program areas as well as COVID-19 pandemic support for the most vulnerable communities. The program also aims to increase representation of Black, Indigenous, and People of Color (BIPOC), low-income communities, and immigrants in the county's programs, which includes better incorporation of racial equity and social justice in the county's climate planning process.[cxxxvii]

Supporting A Climate Ready Region

Climate change will impact the region's most vulnerable populations disproportionately. Adapting to these risks rely heavily on the development of accessible and meaningful engagement opportunities with these populations. Typical outreach strategies may not be reaching our most vulnerable residents. Communication efforts must be expanded to ensure climate risk communications are accessible, digestible, and empower diverse communities to understand risks, and engage in the dialogue on resilience measures to ensure an equitable climate future.

Level of Implementation Needed to Address Climate Risks

All local governments need to engage the public, with an emphasis on engaging and empowering potentially vulnerable communities, to support the goal of becoming a Climate Ready by 2030. This action addresses all climate risks including extreme heat, drought, flooding (flash, riverine, and coastal), lightning/ thunderstorms and extreme winter conditions.

How COG Can Support

- Support information sharing of best practices and region-specific messaging for effective community outreach strategies to diverse communities.
- Provide region-wide information identifying vulnerable populations such as transportation Equity Access Areas and community level health impact data.

How Member Jurisdictions Can Support

- Integrate climate projections, risks, and strategies into existing community outreach programs.
- Further build partnerships with community groups and leaders to improve communication and engagement strategies.
- Engage potentially vulnerable communities in assessing their vulnerabilities (social, ecological, economic, public health) to climate impacts.
- Provide direct assistance (technical and financial) to potentially vulnerable populations.
- Develop metrics to measure the effectiveness of outreach efforts with diverse communities.

Region Forward Co-Benefits:

- **Equity and Education:** As vulnerable populations are disproportionally impacted by climate change, efforts to engage diverse communities helps ensure an equitable climate future.

EQ-4: SUPPORT EQUITABLE SECURE ENERGY ACCESS

Action Overview

Energy equity ensures the fair distribution of energy supply to all residents regardless of socio-economic status, accessibility, and affordability. As the region transitions to a clean energy economy, the most vulnerable populations in our region must have access to secure and affordable clean energy to ensure an equitable climate future for all. Vulnerable populations may have less ability to respond to or recover from climate impacts. Secure and reliable energy access, especially during and after extreme events, will assist in reducing economic and social disparities in our region.

In 2019, the Arlington County Board adopted the Community Energy Plan that establishes equity as a focus to inform design, investment and implementation of the plan. The plan ensures equitable access to a clean, reliable, and secure grid for vulnerable populations and low-to-moderate income communities. Prince George's County launched an Energy Resiliency Communities to improve the energy resiliency of seven underserved communities. The county is providing grants to homeowners for electric and natural gas improvements, solar installations, and installation of a socket that can provide a limited amount of power from the solar installation during widespread power outages.[cxxxviii]

Supporting A Climate Ready Region

As climate change puts an increasing stress on energy infrastructure, ensuring systems and assets are resilient to flooding, extreme heat, and extreme weather events while providing accessible and affordable clean energy to all residents is critical to provide life-saving services before, during, and after acute events and in response to chronic conditions. Future climate impacts will require a reliable and resilient energy system that can withstand frequent, severe climate events while delivering affordable and reliable energy to all residents including the most vulnerable in our communities.

Level of Implementation Needed to Address Climate Risks

Implementing mechanisms to ensure equitable secure energy access for all will help grow towards the goal of a climate resilient region by 2050 through empowering the notion of resilient communities. This action addresses climate risks of extreme heat, flooding (flash, riverine, and coastal), lightning/ thunderstorms and extreme winter conditions.

How COG Can Support

- Support sharing of best practices for equitable access to secure, affordable clean energy.
- Advocate for state and federal actions to enhance access to secure, affordable clean energy.

How Member Jurisdictions Can Support

- Implement local government energy assurance initiatives in potentially vulnerable communities.
- Direct resilience incentives and technical assistance to potentially vulnerable communities.
- Coordinate with utilities and promote electric grid and natural gas pipeline hardening, bulk fuel suppliers to promote resilient supply chains, and prioritize infrastructure improvements in potentially vulnerable communities.
- Prioritize microgrid deployment in potentially vulnerable communities.
- Ensure vulnerable communities will have access to basic services during power outages.

Region Forward Co-Benefits:

- **Equity:** Vulnerable populations are disproportionally affected by climate impacts. Efforts to provide equitable secure energy ensures all residents have access to an equitable future.
- **Public Safety:** Providing secure access to energy for all ensures the public can have access to lifesaving services during extreme events.

RI-1: SUPPORT ESTABLISHMENT OF RESILIENCE HUBS

Action Overview

A resilience hub is a community-serving accessible facility that provides community-building activities, steady state support to local residents, and life-saving resources before, during, and after climate events. Resilience hubs not only provide safe haven for residents during extreme events but provide year-round support to improve local adaptive capacity and foster community building. Additionally, resilience hubs can be energy independent, which proves vital energy supply during power outages and extreme weather events, including emergency heating and cooling, charging ability, and storing of emergency medication and equipment.[cxxxix]

As part of Washington D.C.'s comprehensive efforts to implement Climate Ready DC, the Department of Energy and Environment (DOEE) is working with the Ward 7 community to develop a neighborhood-scale resilience hub in a trusted space by the community. Ward 7 faces disproportional climate risks compared to the majority of the city. The resilience hub will provide yearlong community support as well as emergency services and resources during crises.[cxl]

Supporting A Climate Ready Region

Vulnerable populations face an increased risk to climate hazards and may have limited resources to adapt to a changing climate. Within vulnerable neighborhoods, residents may lack access to resources necessary to prepare for and recover from climate events. During extreme events, resilience hubs can provide lifesaving supplies (food, water, power, etc.). Resilience hubs enhance social cohesion within communities by shifting power to local communities to establish community-driven climate resilience.

Level of Implementation Needed to Address Climate Risks

Establishment of resilience hubs in vulnerable communities to serve the people most impacted by climate change will help the region achieve full resilience by 2050. This action addresses all climate risks including extreme heat, drought, flooding (flash, riverine, and coastal), lightning/ thunderstorms and extreme winter conditions.

How COG Can Support

- Partner on grant applications and provide engineering support through regional contracts.
- Coordinate the sharing of best practices through workshops and materials (fact sheet, resource guides etc.).

How Member Jurisdictions Can Support

- Identify most climate vulnerable communities and assess the potential to establish resilience hubs in those communities.
- Leverage relationships with community organizations and leaders to identify needs of the community and implement resilience hubs and other neighborhood-scale resilience solutions.
- Partner with energy providers to develop resilience hubs with an uninterruptable energy supply.

Region Forward Co-Benefits:[cxli]

- **Equity:** Resilience hubs empower local communities by shifting segments of decision-making efforts to members of the community as well as help residents access resources, materials and support year-round.
- **Public Safety:** Implementing resilient hubs ensures the public can have access to lifesaving services during extreme events.
- **Economy**: Resilience hubs can provide resources, tools, and job training for economic stability.

RI-2: IMPROVE THE RESILIENCE OF CRITICAL INFRASTRUCTURE

Action Overview

The consequences to metropolitan Washington's energy, water, transportation, and communication systems from climate impacts are life threatening and may cause long-term physical and economic damages. Extreme events, such as Hurricane Sandy and Derecho event of 2012, severely impacted the region's ability to provide critical services during times of crisis. Priority critical infrastructure, such as hospitals and 9-1-1 centers, will need to further implement measures that increase resilience to continue to operate and serve the community during and after disasters. As climate change further strains the region's aging infrastructure, implementing measures to ensure critical infrastructure is resilient to a changing climate is essential.

As part of a comprehensive effort to ensure the resilience of critical public services during major outages, Montgomery County installed a microgrid at its Public Safety Headquarters (PSHQ). The project features 2 megawatts of solar photovoltaic parking lot canopies, an 800-kilowatt Combined Heat and Power (CHP) system, electric vehicle charging stations and a cyber security system.[cxlii]

Supporting A Climate Ready Region

As existing infrastructure ages and populations grows, infrastructure will need to be replaced, upgraded, and expanded. Climate projections show as the number of hot and cold days will be increasing, more frequent and severe extreme weather events may impact infrastructure. Water utility, and energy utility infrastructure that already incur sizable maintenance costs and risks may face an increased strain and will require upgrades and design standards that take into consideration future climate projections.

Level of Implementation Needed to Address Climate Risks

Assessing critical infrastructure now is essential to establish the necessary actions to ensure all critical infrastructure and functions are climate resilient in the region by 2050. This action addresses all climate risks including extreme heat, drought, flooding (flash, riverine, and coastal), lightning/ thunderstorms and extreme winter conditions.

How COG Can Support

- Support systematic planning for protection of critical infrastructure identified through the COG Critical Infrastructure Working Group.
- Increase capacity to utilize Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation Program funding and identify other sources of funding.
- Coordinate the sharing of feasibility studies and best practices for measures to increase resilience of critical infrastructure.
- Partner with local governments on risk studies.

How Member Jurisdictions Can Support

- Assess vulnerability of existing and planned critical infrastructure for transportation, communication, energy, and water system assets.
- Flood proof critical water, stormwater, and wastewater systems to reflect climate projections.
- Revise infrastructure design standards to be more resilient to heat, flooding, and other climate impacts.
- Incorporate resilient critical infrastructure investments into long-range plans.

Region Forward Co-Benefits:

- **Public Safety:** Implementing resilient measures to existing infrastructure ensures public safety entities can provide lifesaving services during extreme events.

RI-3: IMPLEMENT MEASURES TO EQUITABLY ADDRESS URBAN HEAT ISLAND

Action Overview

Heat is one of the leading causes of weather-related injuries and fatalities in metropolitan Washington. As extreme heat days become more prevalent, the region will face a high threat from extensive heat waves. Extensive development within metropolitan Washington has resulted in a significant number of areas with impervious surfaces and limited tree canopy. Populations residing in these areas, especially vulnerable peoples, will be more severely impacted by extreme heat. [cxliii]

The District of Columbia is taking many steps to reduce the impacts of the urban heat island effect. The District's Urban Tree Canopy Plan aims to increase a healthy tree canopy cover to 40 percent by 2032. The District's RiverSmart Green Roof Rebate Program offers rebates between $10-15 per square foot to promote the voluntary installation of green roofs. The green roofs help reduce the urban heat island effect and improve stormwater management practices.[cxliv]

Supporting A Climate Ready Region

Extended periods of extreme heat can result in loss of human life, power outages, and infrastructure damages. The elderly, low-income persons, persons with allergies and underlying health conditions are especially vulnerable to extreme heat. As development increases, incorporating cooling strategies that prioritizes vulnerable populations is essential to reduce the urban heat island effect. Passive cooling mechanisms such as tree canopy and vegetation will substantially reduce risks to human life without increasing the regions reliance on energy. [cxlv]

Level of Implementation Needed to Address Climate Risks

Reducing the impacts of extreme heat and the urban heat island effect assists the region in becoming Climate Ready by 2030. This action primarily addresses the climate risk of extreme heat but can also flooding (flash, riverine, and coastal) risks.

How COG Can Support

- Strategically coordinate the planting of new trees to expand the regional tree canopy to lower ambient air temperatures during summer months.[cxlvi]
- Prioritize and assess funding opportunities for implementation measures including cool and green roofs, and green walls.
- Support urban heat island and vulnerability mapping across the region.

How Member Jurisdictions Can Support

- Develop thermal mapping to identify urban heat island hot spots, impacted vulnerable populations, and potential areas for mitigation strategies.
- Assess existing and future cooling centers based on extreme heat projections and needs of vulnerable populations. Consider factors including accessibility, language interpreters, backup power support, medical assistance, and food and water supplies.
- Support urban forestry programs and incentives to maximize canopy in vulnerable communities.
- Implement cool and green roofs, and green walls.

Region Forward Co-Benefits:

- **Equity:** Tree planting should be prioritized in vulnerable communities with limited access to parks and green spaces.[cxlvii]
- **Health and Human Services:** Urban tree canopy can improve air quality, reduce mental distress, and may have positive health effects. [cxlviii]
- **Land Use and Environment:** Urban trees improve air and water quality. Urban trees helps cool air temperatures and reduce stormwater runoff.[cxlix]

RI-4: ENHANCE GREEN INFRASTRUCTURE NETWORKS

Action Overview

Protections against climate-driven risks can take the form of hard infrastructure improvements such as flood walls or constructing resilience hubs, or nature-based, resilient green infrastructure networks to restore and manage natural ecosystem functions to increase capacity to adapt to a changing climate. Green infrastructure is an interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other important natural areas. An interconnected system of natural areas protects biodiversity, enhances natural community resiliency, and buffers the impacts of development—all while providing multiple public benefits. In some contexts, the term green infrastructure refers to low impact development and stormwater management, or recreational trail networks. For the purposes of this measure, green infrastructure relates to land cover and waterways.[cl]

There are several ways to enhance nature-based, resilient green infrastructure network, such as green infrastructure plans, natural resource management plans, or green space plans. Prince George's County's Green Infrastructure Plan identifies existing green infrastructure elements throughout the county and proposes conservation mechanisms to preserve, protect, and enhance these elements. Fairfax County Natural Resource Management Plan focuses on protecting and enhancing natural capital, restoring ecosystems and fostering stewardship.[cli]

Supporting A Climate Ready Region

Resilient green infrastructure can reduce the need for hard infrastructure improvements. The region has existing nature-based protections, such as the parkland located along many of the region's waterways and existing urban tree canopy that can be expanded on.

Level of Implementation Needed to Address Climate Risks

Resilient green infrastructure can reduce the impacts of extreme heat and flooding to support the region in becoming Climate Ready by 2030.

How COG Can Support

- Work with partners to evaluate coastal, inland and overland flooding risks and options to use green infrastructure and natural systems to reduce climate risks.

How Member Jurisdictions Can Support

- Design and plan for resilient green infrastructure before development occurs.
- Implement a plan to preserve and enhance ecologically valuable green spaces in urban, suburban and rural areas, such as a green infrastructure plan, natural resource management plan, or green space plan.
- Invest in nature-based, resilient green infrastructure network solutions to reduce risk from flooding and extreme heat.

Region Forward Co-Benefits:

- **Equity:** Resilient green infrastructure enhancements should be prioritized in vulnerable communities with limited access to parks and green spaces.
- **Health and Human Services**: Enhancing green infrastructure networks can decrease pollution from stormwater runoff into rivers and streams and reduce associated adverse health impacts.
- **Land Use and Environment:** Enhancing green infrastructure networks supports preservation of open space, green space, wildlife habitat, and helps reduce stormwater runoff.

RI-5: IMPLEMENT MEASURES TO REDUCE FLOOD RISKS

Action Overview

Changes in the frequency and severity of flooding, and sea level rise will require the region to adapt to an increasing flood risks that threatens the regions ability to provide water, energy, and transportation services. Reducing risks to flooding is heavily influenced by the amount and type of development, shore protection measures, site and building design, stormwater drainage infrastructure, nature-based solutions (wetlands, vegetation, etc.), structural (floodwalls, levees, bulkheads etc.,) and non-structural measures (relocation, zoning and flood insurance) and other resilience flood measures. The region relies on shared infrastructure for water, communications, energy, and transportation services; therefore, each entity/system within our region is only as protected as the weakest link in the regional infrastructure system.[cliii]

The City of Alexandria is undertaking a multi-year capital flood project on the city's waterfront to reduce flooding and improve stormwater collection and transport. Some of the measures include elevating areas that frequently flood, a new bulkhead and elevated walkway, and integrating low flood walls to protect against the 10-year flood. Metro conducted a system-wide flood resiliency infrastructure upgrades assessment and has started designing some critical infrastructure projects to protect against the adverse effects of climate change.[cliii]

Supporting A Climate Ready Region

Flooding is a main hazard of concern in metropolitan Washington. More frequent and severe precipitation events and water level rise, aging infrastructure, and rapid development and population growth will strain stormwater and sewer collection systems. The impacts of flooding are expected to be exacerbated with a changing climate, leading to asset damage and deterioration, threatening operability of critical infrastructure, increasing stormwater runoff, and property damage.

Level of Implementation Needed to Address Climate Risks

Incorporating measures to reduce flood risks green can reduce the impacts of flooding and support the region in becoming Climate Ready by 2030.

How COG Can Support

- Partner to evaluate coastal, inland and overland flooding risks and options to reduce risks.
- Support legislation and funding opportunities that address flood control and management, water quality programs, and stormwater management in the region.

How Member Jurisdictions Can Support

- Identify at-risk facilities based on flooding and sea level rise. Prioritize resilience strategies based on age of facilities and critical need.
- Use nature-based solutions, non-structural, and structural measures to reduce flood risks.
- Increase the resilience of water, stormwater, and wastewater system. Secure investments for green and grey infrastructure to improve the capacity of these systems.
- Prioritize existing properties vulnerable to flooding for buyouts, incentives and easements.
- Adopt and implement green street policies and programs.

Region Forward Co-Benefits:

- **Economy and Equity:** Incorporating resilience measures can limit the financial impacts of flooding events and reduce the burden to vulnerable populations.
- **Health and Human Services:** Incorporating resilience measures can decrease pollution from stormwater runoff into rivers and streams and reduce associated adverse health impacts.

Mitigation-Resilience Co-Benefits

Responding to climate change requires addressing both mitigation and resilience strategies. Mitigation strategies primarily focus on reducing the causes of climate change, while resilience strategies center around limiting the impacts of climate change and adapting to a new climate. Many of the mitigation and resilience actions provide co-benefits that reduce greenhouse gas emissions and reduce vulnerabilities to the negative consequences of climate change.

As climate events become more severe and frequent, incorporating actions that have both mitigation and resilience benefits is even more invaluable. This is addressed in a number of areas in this plan.

- Efforts to enhance tree canopy provides both mitigation benefits via carbon sequestration and reduced energy consumption due to shading during the cooling season and resilience benefits via minimizing the urban heat island effect. Additionally, efforts to enhance tree canopy provide water quality environmental benefits as it reduces stormwater runoff into surface waters and enhances the qualities of and increases the value of open space.
- Public education efforts about climate change can use resiliency risks as a more tangible example of why climate change should be addressed. The longer-term benefits of mitigation may be less apparent to the public. Using resiliency, particularly tied to current events, such as floods from heavy summer storms or hurricanes, a derecho, or the increased western United States fires, as a way to open the door can more effectively enable people to see the direct effects on their lives. This then can be used to motivate mitigation action.
- Resilience hubs both can provide a short-term benefit to communities during an acute event and serve as an example of mitigation actions. One factor driving adoption of distributed solar is the presence of other distributed solar in a community. New adopters may become more comfortable to adopt the technology when the see neighbors, either houses or businesses, successfully using on-site solar. Incorporating on-site solar into resiliency hubs serves to address resiliency risks and meet mitigation goals.
- Accelerating deployment of battery storage similarly serves both resiliency and mitigation goals. Battery storage improves resiliency by providing for emergency power when alternative energy systems cannot produce. They also enhance mitigation as they can increase the use of renewable energy by storing excess generation for later use.
- Property Assessed Clean Energy (PACE) financing is one tools to increase the adoption of deep building retrofits, an important mitigation goal. PACE financing is now eligible in some jurisdictions, such as Fairfax County, as a funding source for resiliency improvements such as floodproofing.
- One of the keys to market circularity is to use what otherwise would be a waste material as an input to other systems. One method to provide for circularity is to provide energy production from wastes. These actions can reduce net greenhouse gas emissions while providing an electricity source that can serve as a black-start resource if needed after loss electric generation and transmission. In its simplest form, black-start resources are able to start when the rest of the grid goes dark, which can then be used to bring the rest of the grid's resources back online.

This discussion addresses some of the co-benefits of mitigation and resiliency strategies. As is true of most systems, energy systems are so inter-related that other mitigation actions will enhance resiliency, and vice-a-versa, although in a less direct manner.