EXECUTIVE SUMMARY

The Metropolitan Washington Council of Governments (COG) is a hub for partnerships to facilitate sustainable growth, a well-maintained transportation system, clean air, water, and land, safe and healthy communities, and a vibrant economy. This work is guided by COG's comprehensive *Region Forward vision*, to ensure a more prosperous, accessible, livable, sustainable, and equitable future for all area residents. In this role, COG has established goals to mitigate greenhouse gas emissions and improve regional climate resiliency. The COG Board established new 2030 goals to supplement earlier 2020 and 2050 goals. The new goals call for further reducing greenhouse gas emissions by 2030, and being a Climate Ready Region, including increased investments in resiliency, by 2030.[i]

This 2030 Climate and Energy Action Plan builds on previous action plans and establish priority collaborative actions for COG's Climate, Energy and Environment Policy Committee (CEEPC) members to work on together over the next ten years to help move the region towards meeting its' 2030 goals. All the actions in the plan are voluntary; the success of the plan will depend on active regional collaboration and implementation.

Plan Purpose and Scope

According to the Intergovernmental Panel on Climate Change (IPCC), a body of the United Nations that assesses the science related to climate change, the world is already experiencing the impacts of 1 degree Celsius of global warming above pre-industrial levels. Additionally, the IPCC notes that more severe climate impacts could be avoided if global warming is limited to 1.5 degrees Celsius. Globally, emissions need to fall by 45 percent from 2010 levels by 2030 and carbon neutral by 2050 to limit global warming to 1.5 degrees Celsius. The IPCC acknowledges rapid and far reaching transitions are needed world-wide in order to limit global warming. [ii]

The 2030 greenhouse gas (GHG) emission reduction goals adopted by the COG Board of Directors on October 14, 2020 align with the level of effort called for by the IPCC. COG Board Resolution R45-2020 established interim climate change goals including:[iii]

- The climate mitigation goal of 50 percent greenhouse gas emission reductions below 2005 levels by 2030;
- The climate resilience goal of becoming a Climate Ready Region and making significant progress to be a Climate Resilient Region by 2030; and
- The need to incorporate equity principles and expand education on climate change into COG's CEEPC and its members' actions to reach the climate mitigation and resiliency goals.

To be a Climate Ready Region by 2030, all local governments must assess current and future climate risks, and be actively integrating climate planning across government plans, operations, and communications. 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.

The purpose of this plan is to establish priority collaborative actions for COG and its members to work on together over the next ten years to help move the region towards meeting the 2030 goals. Achieving the regional goals would require unprecedented, aggressive cross-sectoral action from all COG members and its state and federal partners.

GUIDING PRINCIPLES

Ten principles guide this plan's voluntary collaborative climate action implementation process. These principles reflect CEEPC's commitment to environmental quality, economic prosperity, and equity. As climate leaders, CEEPC is committed to the following principles:

1. **Collective Action**: We will continue to work together to leverage our impact and facilitate application at scale.
2. **Effective Partnerships**: We will continue to share best practices, learn together, and coordinate on implementation to advance regional transformation.
3. **Lead by Example**: We have a continued commitment to internal implementation of long-term solutions to reduce the climate impacts of our operations.
4. **Integration:** We understand climate action is inherently multidisciplinary and will promote cross-department coordination, including in areas such as equity, health, and economic development.
5. **Flexibility**: We understand the need for flexibility in how our public agencies and stakeholders across the District of Columbia, Maryland, and Virginia work to achieve regional GHG goals.
6. **Transparency**: We will continue to measure and report progress in a manner easily understandable by all.
7. **Innovation**: We support a just transition to a clean energy economy through the application of innovative technology, policies, and processes by public and private sectors.
8. **Community Leadership**: We will continue to educate, motivate, and empower action from our community's institutions, businesses, non-profits, and residents.
9. **Inclusive Engagement**: We commit to inclusive community engagement and equitable provision of climate and energy programs and services.
10. **Advocacy**: We will continue to support state and federal policies and programs that protect the human and environmental health of our communities.

Plan Elements

There are four core elements to this plan, including:

- **Greenhouse Gases**: This section of the plan provides a summary of regional GHG inventory trends from 2005 to 2018, business-as-usual (BAU) GHG emission projections through 2030, and technical scenario showing what it will take for the region to reach GHG reductions of 50 percent below 2005 levels by 2030.
- **Climate Mitigation Strategy**: This section of the plan identifies CEEPC's priority collaborative mitigation actions to move the region toward achieving the GHG emission reduction goal of 50 percent by 2030, below 2005 levels. The action areas include Planning, Equity, Clean Electricity, Zero Energy Buildings, Zero Emission Vehicles, Mode Shift and Travel Behavior, Zero Waste, and Sequestration.
- **Climate Risks and Vulnerabilities**: This section of the plan provides a summary of the Regional Climate, Risk and Vulnerability Assessment (CRVA). The CRVA evaluates climate hazards including extreme heat, drought, lightning and thunderstorms, flash and riverine flooding, coastal flooding and extreme winter conditions. The CRVA also evaluates factors

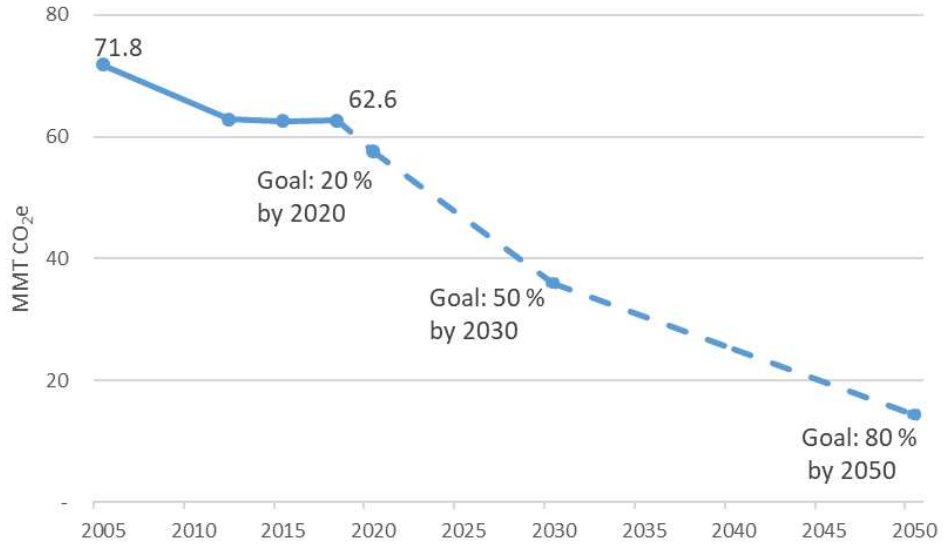
impacting adaptive capacity, such as infrastructure conditions and maintenance, access to basic services, and public health.

- **Climate Resilience Strategy**: This section of the plan identifies CEEPC's priority collaborative climate resilience actions to move the region toward achieving the goal of becoming a Climate Ready Region and making significant progress to be a Climate Resilient Region by 2030. The action areas include Planning, Equity, and Resilient Infrastructure.

GHG Inventory

COG's greenhouse gas inventories show that the region's progress to date towards the GHG emission reduction goals has been mixed. The region exceeded its 2012 goal but is lagging on progress towards its 2020 goal. The most recent inventory indicates that 2018 GHG emissions in the region decreased by approximately 13 percent below 2005 levels, despite a 19 percent growth in population. Per capita emissions decreased between 2005 and 2018 from 15.6 metric tons of carbon dioxide equivalent ($MTCO_2e$) in 2005 to 11.4 $MTCO_2e$ in 2018. Expedited and concerted actions will be needed throughout the region to achieve future goals of 50 percent GHG emission reduction by 2030 and 80 percent by 2050 (Figure ES-1).

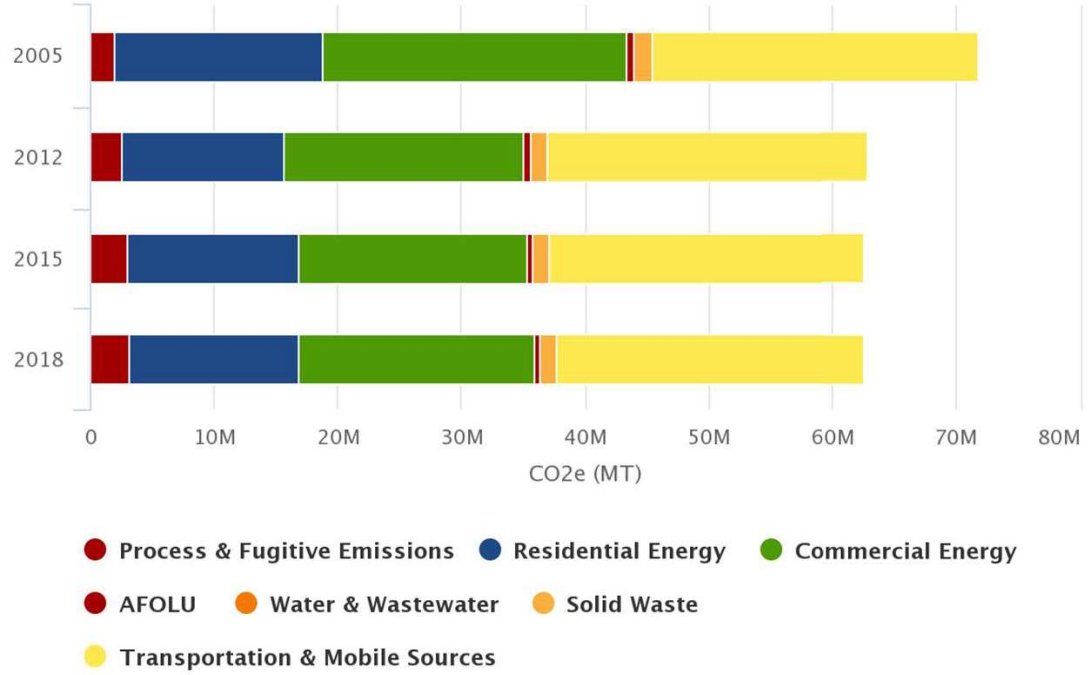
Figure ES-1: Metropolitan Washington GHG Trends and Goals



EMISSIONS ACTIVITIES

The inventories measure GHG-emitting activities undertaken by residents, businesses, industry, and government located in metropolitan Washington, as well as emissions from visitors. Approximately 90 percent of metropolitan Washington's GHG emissions come from residential and commercial building energy consumption and transportation. Building energy consumption accounts for 52 percent and 40 percent is from transportation. The remainder of emissions comes from other activities and sources including solid waste, wastewater treatment, agriculture and fugitive emissions (Figure ES-2).

Figure ES-2: Metropolitan Washington GHG Emissions by Activity

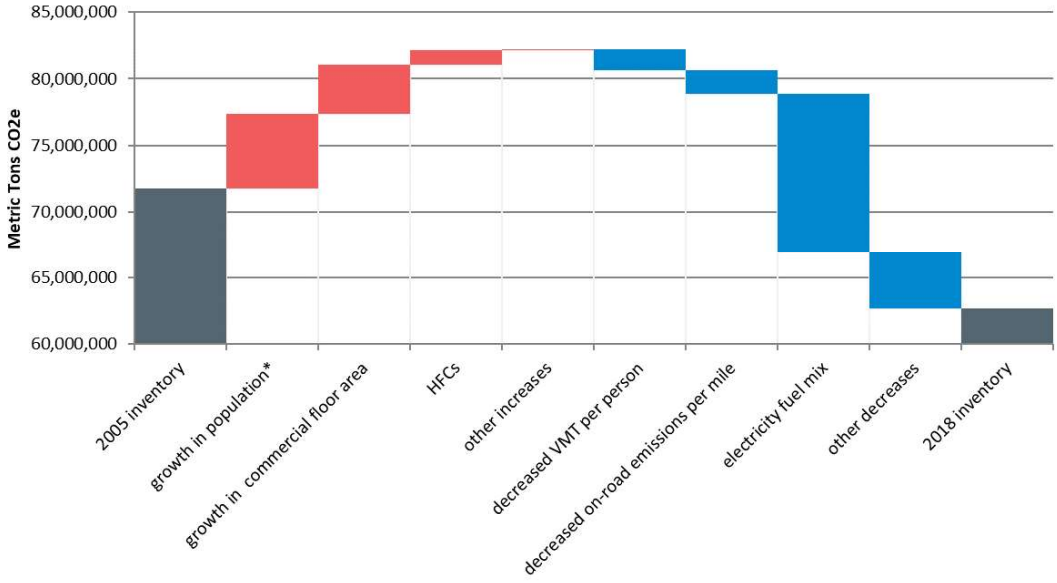


Source: ICLEI's ClearPath, an online greenhouse gas inventory tool.

DRIVERS OF GHG CHANGE

The metropolitan Washington GHG Contribution Analysis results in Figure ES-3 shows what has driven increases and decreases in emissions between inventory years 2005 and 2018. The main drivers increasing emissions (red bars) include growth in population, commercial space, and hydrofluorocarbons (HFCs). Driving down emissions (blue bars) is mainly a cleaner grid, cleaner cars and reduced vehicle miles traveled (VMT) per person.

Figure ES-3: Drivers of Metropolitan Washington GHG Changes

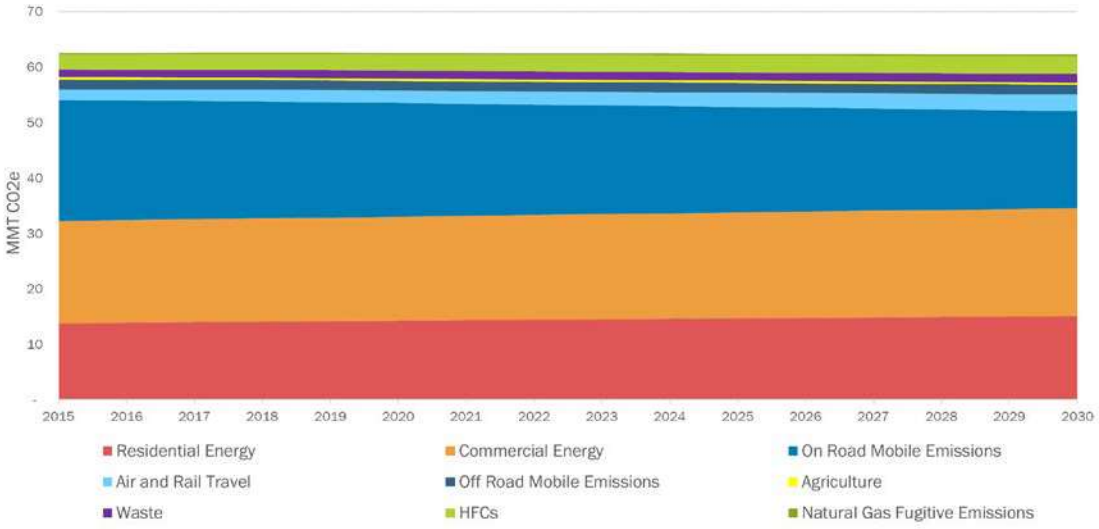


*Includes effects of population on residential energy, VMT and waste generation.

Business-As-Usual Projections[iv]

Business-as-usual (BAU) projections provide a baseline scenario for future GHG emissions. BAU projections take into account population, housing, and commercial growth as well as policies and practices that have been in place and implemented to-date to reduce GHG emissions. Figure ES-4 shows that the region's anticipated BAU emissions projected out to 2030 overall remain flat.

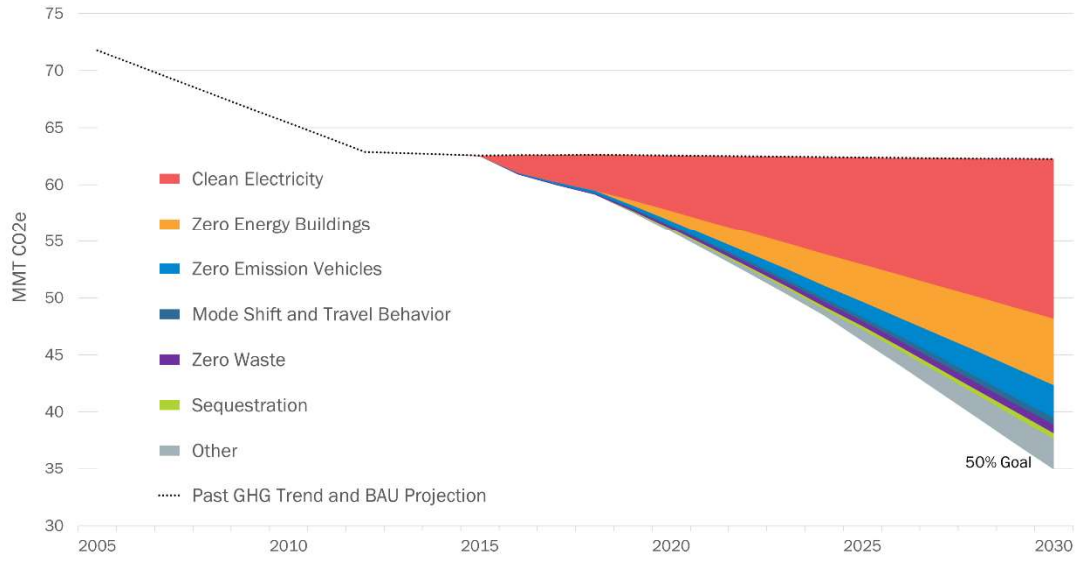
Figure ES-4: Metropolitan Washington Business-As-Usual Projections



2030 Scenario[v]

The 2030 scenario for this plan analyzes the technical potential of "What Would It Take" for metropolitan Washington to reach a 50 percent reduction in GHG emissions by 2030 from 2005 levels. This scenario leverages results from a previous scenario analysis conducted in 2015 by COG's Ad-Hoc Multi-Sector Work Group and results have been updated based on new data and progress since that time. Figure ES-5 on the shows a summary of the 2030 scenario results. Considerable action across local, regional, state, and national levels will be needed.

Figure ES-5: Metropolitan Washington "What Would It Take" Scenario Results



Regional Mitigation Strategy

The Regional Mitigation Strategy includes collaborative actions to support the region in achieving the GHG emission reduction goals of 50 percent by 2030 below 2005 levels and 80 percent by 2050. The climate action areas included in the Regional Climate Mitigation Strategy address: Planning, Equity, Clean Electricity, Zero Energy Buildings, Zero Emission Vehicles, Zero Waste, Mode Shift and Travel Behavior and Sequestration. Within these action areas are high-level priority actions for COG and its members to focus on through 2030. All actions are voluntary. Table ES-1 is a summary of the climate action areas and priority collaborative actions described in this strategy.

Table ES-1: Metropolitan Washington Priority Collaborative Mitigation Actions

Climate Action Area	Action ID	Priority Collaborative Action
Planning	PL - 1	Advance Climate Planning and Track Progress
Equity	EQ - 1	Enable Equitable Planning Practices
	EQ - 2	Prioritize Sustainable Energy Access for All
Clean Electricity	CE - 1	Advocate for Aggressive Renewable Portfolio Standards
	CE - 2	Accelerate Development of On-Site Renewables
	CE - 3	Accelerate Deployment of Battery Storage
	CE - 4	Accelerate Development of Microgrids for Critical Infrastructure
	CE - 5	Accelerate Development of Large-Scale Off-Site Renewables
	CE - 6	Advocate for and Implement Community Choice Aggregation
Zero Energy Buildings	ZEB - 1	Expand Building Benchmarking Requirements
	ZEB - 2	Accelerate Deep Building Retrofits
	ZEB - 3	Enhance Green Building Codes and Policies to Facilitate Net Zero Energy Building Development
	ZEB - 4	Expand Proper Disposal and Leak Detection of Refrigerants
Zero Emission Vehicles	ZEV - 1	Expand Light-Duty Electric Vehicle Deployment
	ZEV - 2	Accelerate Electrification of Medium- and Heavy-Duty Vehicles
	ZEV - 3	Build Out Regional Electric Vehicle Charging Network
Mode Shift and Travel Behavior	MSTB - 1	Invest in Infrastructure that Increases Transit, Carpooling, and Non-Motorized Travel
	MSTB - 2	Bring Jobs and Housing Closer Together
	MSTB - 3	Enhance Options for Commuters
Zero Waste	ZW - 1	Implement Curbside Organics Recycling Programs
	ZW - 2	Reduce Solid Waste Generation
	ZW - 3	Build Markets for Circularity
Sequestration	SQ - 1	Strategically Plant New Trees on Publicly Owned Land
	SQ - 2	Enhance Regulatory Capacity to Manage Tree Canopy and Forest Protection
	SQ - 3	Enhance Incentives and Financing Mechanisms for Tree Planting and Preservation on Privately Owned Lands

Climate Risk and Vulnerabilities

In 2018, The Intergovernmental Panel on Climate Change (IPCC) released the *Global Warming of 1.5 °C*, an IPCC special report, highlighting that the world is already experiencing the impacts of 1 degree Celsius warming above pre-industrial levels but more severe climate impacts could be avoided if global warming is limited to 1.5 degrees Celsius. If the rate of warming continues, 1.5 degrees Celsius warming is likely to occur between 2030 and 2052 with more frequent and severe extreme weather events becoming even more prevalent.[vi]

As the IPCC noted internationally, metropolitan Washington is also experiencing the impacts of a changing climate. Observations in metropolitan Washington show that temperatures and the water surface level in the Potomac River have been rising and will continue to rise. Extreme weather events and increases in the number of extreme heat and cold days will increase risks to health, energy usage patterns, plant and animal habitats, and infrastructure. These changes are also affecting stormwater, drinking water, and wastewater. Implementing regional adaptation strategies are necessary to reduce the impacts of climate change.[vii]

A climate risk and vulnerability assessment (CRVA) was conducted for metropolitan Washington with the goal of understanding the climate hazards that face the region and assessing the likelihood and impact of current and future hazards on the region. Climate change may increase the frequency or severity of climate hazards in metropolitan Washington, including extreme heat (high day and night temperatures), drought, flooding (flash, riverine, and coastal), lightning and thunderstorms, and extreme winter conditions.

METHODOLOGY

The regional CRVA methodology is based on the Global Covenant of Mayors for Climate and Energy (GCoM) framework. GCOM is a global alliance of cities and local governments that support voluntary action to address climate change and ensure a low emission, climate resilient future.[viii] The CRVA identifies and describes current and anticipated climate hazards metropolitan Washington faces. As shown in Table ES-2**,** each hazard is assigned a risk level, based on probability and level of consequence (probability x consequence). After the hazard risks are identified, an assessment is conducted to determine the future change in intensity and frequency, and the timeframe over which this will occur: Immediately, Short Term (by 2025), Medium Term (by 2050), and Long Term (after 2050).

Table ES-2: Climate Risk Sourcing Matrix

		Probability		
Consequence		Low (1)	Moderate (2)	High (3)
	High (3)	3	6	9
	Moderate (2)	2	4	6
	Low (1)	1	2	3

Next, vulnerabilities were assessed to determine the degree in which the people, systems, sectors, and systems are susceptible to current and future climate impacts. The impacts assessed include, but are not limited to: services lost, environmental impact, property damages, public health threats, economic loses, and other disruptions to day-to-day operations. For each hazard, relevant population groups in the region were identified that are most vulnerable to future climate hazards and impacts. Finally, for each hazard, factors were assessed that may impact the region's adaptive capability.

As shown in Table ES-3, the most prominent climate hazards facing metropolitan Washington include extreme heat and flash and riverine flooding. More frequent extreme heat days will lead to public health concerns, increase energy demand, travel disruptions, and maintenance and infrastructure damages. With more frequent and intense storms, flash and riverine flooding will increase disruptions and damages to infrastructure and emergency services, and further threaten vulnerable populations.

Table ES-3: Risk Level of Hazards in Metropolitan Washington

Hazard	Probability	Consequence	Risk
Extreme Heat	3	3	9
Drought	2	3	6
Flooding (Flash and Riverine)	3	3	9
Coastal Flooding	3	2	6
Lightning/Thunderstorm	3	2	6
Extreme Winter Conditions	2	3	6

The region must adapt to climate change. Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences."[ix] Table ES-4 shows the degree of challenge identified for each sector evaluated in the CRVA. Infrastructure conditions pose the highest degree of challenge due to the impacts on maintenance costs, aging facilities, interoperability, and increased demand. Resilient critical infrastructure is essential to the well-being, health, and safety of the people in metropolitan Washington. Implementing resilient measures for all critical infrastructure by 2050 is necessary to respond to a changing climate.

Table ES-4: Metropolitan Washington Adaptive Capacity Degree of Challenge

Factor	Degree of Challenge
Infrastructure Conditions/Maintenance	High
Access to Basic Services	Moderate
Access to Healthcare	Moderate
Public Health	Moderate
Housing	Moderate
Poverty	Moderate
Community Engagement	Moderate
Environmental Conditions	Moderate
Economic Health	Low

VULNERABLE POPULATIONS

Climate change will impact people and communities differently. Potentially vulnerable populations may include low-income, minority, marginalized groups, women and girls, persons in sub-standard housing, people with limited English proficiency, the elderly, children, people with chronic health problems, or disabled persons. As vulnerable populations face greater risks, their consideration and inclusion in climate change planning is essential to ensure equitable distribution of benefits. Creating resilient communities is only possible when inclusion of vulnerable populations' needs are met.

Regional Resilience Strategy

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.

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. Table ES-5 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.

Table ES-5: 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

Conclusion

COG's Climate and Energy Program is one of the nation's first initiatives to address climate change on a regional level. The regional effort is led by the Climate, Energy and Environment Policy Committee (CEEPC) and guided by this plan. COG will continue to work with its regional partners to meet its goals for 2030 and beyond.