VISION 2050 PLANNING RESOURCES

Climate Change and Resilience Guidance

December 2022

Puget Sound Regional Council

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INTRODUCTION

VISION 2050 sets out a goal for the region to substantially reduce emissions of greenhouse gases that contribute to climate change and to prepare for climate change impacts. Climate change is influenced by all aspects of our daily lives – from the products we buy, to the places we live, to how we transport ourselves, among other things – and also has the potential to impact all aspects of our daily lives – from our health to our infrastructure, to the food we consume and the water we drink.

Recognizing this, VISION 2050 identifies multicounty policies and actions for the region and local governments to implement to address climate change — to both reduce emissions and to increase resilience to impacts – spanning all sectors throughout the document.

PSRC's Plan Review Manual and VISION 2050 Consistency Tool for Comprehensive Plans include a Climate Change section that provides a crosswalk between VISION 2050's multicounty planning policies and policy objectives for local plans and policies. This guide also helps jurisdictions meet the policy objectives for consistency with VISION 2050 and implement CC-Action-1. In addition, counties may have additional policies related to greenhouse gas emissions and mitigation in their countywide planning policies.

PSRC recognizes that steps are currently being taken at all levels of government to address climate change. This document attempts to provide more detail and guidance to the policies and actions in VISION 2050, acknowledging and reinforcing work already being done and providing support to those just getting started.

The document provides information on both **emission reduction** activities and **resilience** activities. The purpose of this document is to support local governments as they update their comprehensive plans and take steps to implement their policies and actions, by providing guidance, best practices and technical assistance. To the extent feasible, each section and policy topic will provide:

- Clarifying information and definitions
- Best practices and examples
- Additional resources
- Tailored guidance depending on the agency's community needs and available resources

PSRC's experience and professional expertise lies in the areas of on-road transportation and land use. Transportation and land use are also two areas where communities have a direct role. As such, guidance on the potential for emission reductions and strengthening resilience within these two topic areas will be more detailed within this document. The document directs the reader to other resources and experts on other topics such as watersheds and building energy usage.
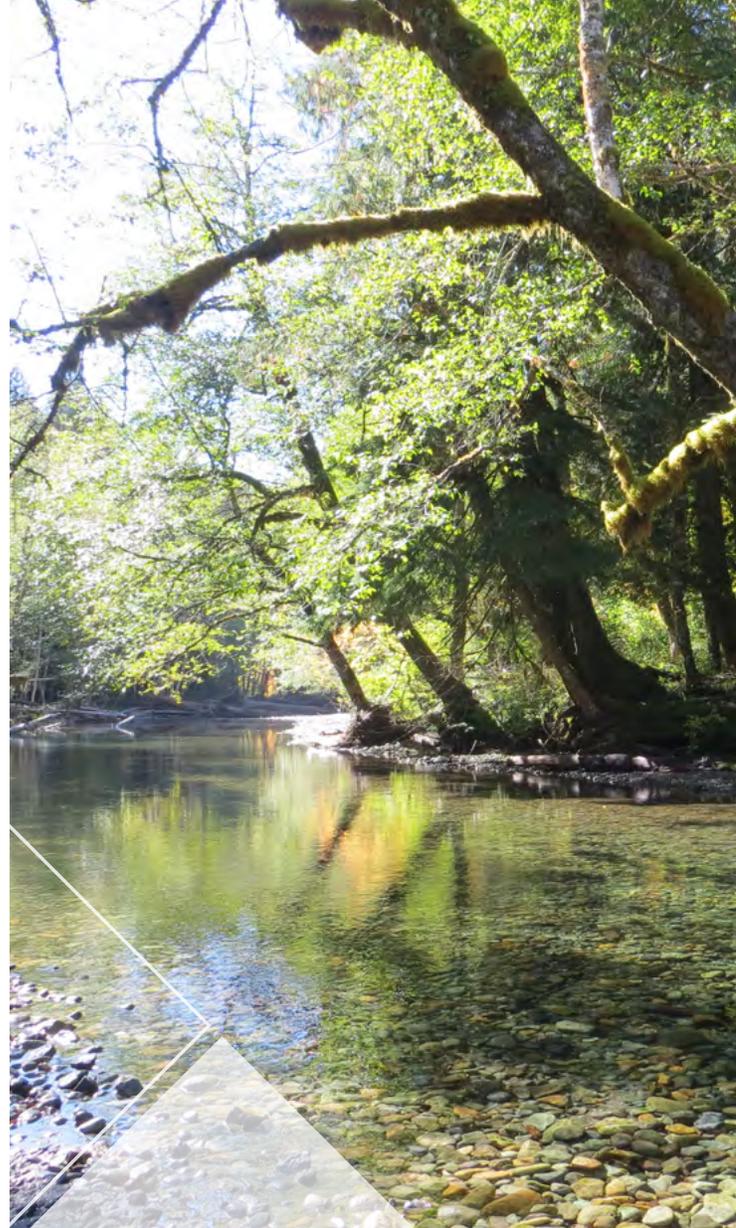
CLIMATE CHANGE MITIGATION-REDUCING GREENHOUSE GAS EMISSIONS

The specific VISION 2050 policies related to the reduction of greenhouse gas emissions are attached to this guidance document and are further discussed below. As described in VISION 2050, the sources of greenhouse gas emissions come from energy use and the built environment, industry, transportation, agriculture, solid waste and wastewater. The largest shares come from building energy use and transportation. Jurisdictions are already planning for and taking actions to reduce emissions across the spectrum of sources and strategies, and many of the policies in VISION 2050 are already addressed in local comprehensive plans. However, to meet the region's climate goals, more work needs to be done.

A consistent theme throughout this guidance document will be that each community is unique – with distinct needs, resources and opportunities. The information below is intended to support this work, across a variety of scales and contexts, by providing additional resources and best practices.

Emission Reduction Goals

VISION 2050 calls for the region to substantially reduce greenhouse gas emissions, working towards the current adopted goals of the Puget Sound Clean Air Agency:

• Reduce to 50% below 1990 levels by 2030

• Reduce to 80% below 1990 levels by 2050.

Achieving these goals will require efforts from all agencies and across multiple sectors and emission sources.

The VISION 2050 climate policies addressing the reduction of greenhouse gas emissions fall under the following categories:

• Building energy use

• Conservation

• Alternative energy sources and electrifying the transportation system

• Reducing vehicle miles traveled and providing alternatives to driving alone

In addition to these specific climate policies, supporting policies are also found throughout other sections such as Transportation, Regional Growth Strategy, and Public Services.

Greenhouse Gas Emission Inventories

Many jurisdictions conduct their own greenhouse gas emission inventories, either using in-house resources or with the support of consultants. PSRC often supports these inventories with transportation and growth data. These inventories vary from detailed and comprehensive evaluations to more generalized assessments based on more aggregated data.

Jurisdictions may choose to conduct these inventories for a better understanding of the sources and trends of emissions within their community. However, if a city or county does not have the resources to conduct an inventory, the policies and strategies for reducing emissions are well established and communities can still make progress and take meaningful actions. The examples in this document provide additional detail on the key strategies as identified in VISION 2050.

In addition, jurisdictions can rely on regional and county greenhouse gas emission inventories. In 2022 an eight-agency partnership worked to update the data through the Puget Sound Regional Emissions Analysis. The project includes emission inventories by county, tools to explore sources of community emissions, and scenario tools to analyze reductions from various potential actions. This update provides a more consistent set of data and assumptions to be used throughout the region.

Emissions inventories are available for counties in the region:

- King County
- Kitsap County
- Pierce County
- Snohomish County

Transportation and Land Use

How communities plan for development – both in terms of type and location – has a direct impact on emissions. In particular, land use patterns can affect whether or not residents are more or less dependent on private vehicles as their primary form of travel. The analysis conducted for VISION 2050 determined that development in outlying areas is likely to generate significantly more vehicle miles traveled than development in our most urban locations, which corresponds directly to emissions.

The Regional Growth Strategy in VISION 2050 calls for the vast majority of growth to occur within the Urban Growth Area and for 65% of the region's population growth and 75% of the region's job growth to locate in regional centers and areas supported by high-capacity transit. This pattern of growth will allow the region to capitalize on transportation options such as the expansion of light rail, bus rapid transit and fast ferries, thereby reducing overall vehicle miles traveled. This pattern also supports communities as they plan for increased walkability for their residents to jobs, schools, and services.

Specific to emissions from on-road transportation, PSRC has adopted a Four-Part Greenhouse Gas Strategy that addresses the potential emission reductions from the categories of land use, transportation choices, user fees and technology. More details on the Four-Part Greenhouse Gas Strategy may be found below and in the adopted Regional Transportation Plan (RTP). The investments and strategies in the RTP lay out the path forward for substantially reducing greenhouse gas emissions from transportation and achieving the region's long-term climate goals.

- **Land Use** – implementation of VISION 2050's transit focused regional growth strategy
- **Transportation Choices** – implementation of the region's integrated high-capacity transit network and other multimodal investments
- **User Fees** – transition to a road usage charge and other pricing tools

Some key examples of ways local jurisdictions can reduce greenhouse gas emissions from the transportation and land use sectors include:

- **Transit and Transit-Oriented Development** – By planning for and supporting new and expanded transit service and transit-oriented development, agencies can support options to private vehicle use and reduce vehicle miles traveled. Even though cities typically do not directly provide transit service, decisions at the local level about the transportation network, street design, and land use pattern have a significant effect on whether transit is viable and successful in a community. Cities and counties are encouraged to work closely with their transit agencies.

- **Bicycle and Pedestrian Networks** - A safe and connected bicycle and pedestrian network will also create options to private vehicle use, particularly for shorter trips. These networks can be even more effective when they provide direct connections to the transit system.

- **Electrification** – Even with the extensive planned expansion of multimodal transportation options throughout the region, a transition to zero emission vehicles is necessary to meet the climate goals. This will require supporting activities at the local level through providing public infrastructure, amending building regulations and codes, and other efforts.

Resources available from PSRC to support local jurisdictions as they plan for expanded transit and nonmotorized infrastructure include the Transportation System Condition Tool, which provides an interactive view of current and future transportation facilities in relation to contextual data such as demographics, congestion, regional centers and other information. The tool can be used to identify current gaps in the system, as well as opportunities to address the needs of future areas of growth, particularly for transit service and nonmotorized connections.

Planning resources related to other VISION 2050 policy topics, such as housing, equity, the regional growth strategy and others, may be found on PSRC's website.

As noted above, each jurisdiction will plan for their unique community needs, and every jurisdiction has a role to play in addressing climate change. Some specific planning examples are provided below.

Transit

Larger cities should coordinate with their transit agency to plan for transit-supportive growth patterns and necessary infrastructure. For example, the City of Bothell has coordinated with Community Transit to plan for and provide necessary infrastructure improvements to support the expansion of Swift Bus Rapid Transit lines. The City also plans for updating development regulations to increase density near transit (for example, as described in the Canyon Park Subarea Plan.)

By contrast, smaller less urbanized cities will have fewer opportunities for high capacity, frequent transit. However, those communities can still work with their transit agency or other providers of specialized transportation services to plan for more community-based alternatives. For example, King County Metro works with local governments through their Community Connections program to develop innovative solutions for those areas of the county that lack regular fixed-route bus service due to infrastructure, density or land use.

Active Transportation

Every jurisdiction in the region currently includes policies and plan for improving active transportation in their comprehensive plans, and many also have stand-alone active transportation plans for improving the networks within their communities. Additional efforts may be supported through the use of PSRC's Transportation System Condition Tool as noted above, which illustrates the existing bicycle and pedestrian network and connections – or gaps – to transit centers and stops.[1]

The City of Lynnwood is undertaking many active transportation planning efforts, including development of a city-wide sidewalk and bicycle plan referred to as a "Multi-Choice Transportation System," and "Connect Lynnwood" to prioritize investments in transit, walking and bicycling.

Electrification

Many jurisdictions are also actively working to advance electric vehicles (EVs) and other zero emissions vehicle options. This includes transitioning their own fleets to EVs, providing publicly available charging stations, and ensuring new developments are able to support the necessary charging infrastructure. The City of Tacoma has set targets for registered EVs, operates numerous charging stations, and launched a discount program, among other activities.

The City of Covington's municipal code includes requirements related to EV charging stations in new developments as well as EV parking space design standards.

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[1] Facilities on minor arterials and above are captured; collectors and local streets are not included in the tool

Similarly, the City of Port Orchard has requirements for EV infrastructure based on type of land uses. Many other organizations are working on the zero-emission transportation future, and many resources are available to help jurisdictions take actions in their own community.

Many other organizations are working on the zero-emission transportation future, and many resources are available to help jurisdictions take actions in their own community.
Some additional resources that may be useful:

- Puget Sound Regional Electric Vehicle Collaborative: forum for knowledge sharing, technical assistance, and website clearinghouse
- Washington State Department of Commerce, Communities Get Ready for Electric Vehicles
- Municipal Research and Services Center, Planning for Electric Vehicles

Building Energy Use

VISION 2050 calls for buildings to be more energy efficient, for alternative energy sources to be pursued and for other conservation efforts to reduce greenhouse gas emissions.

Energy is a constant part of our lives. Energy powers the lights, it heats and cools our homes, and it powers the numerous devices and appliances that we use every day. Energy consumption for these uses in residential and commercial buildings accounts for approximately 38% of the total greenhouse gas emissions in the region. Along with reducing emissions from transportation, reducing energy consumption in buildings is also critical to meeting the region's climate goals. This can take the form of two fundamental shifts: reducing consumption, often through improved efficiency, and transitioning away from fossil fuels.

Improving energy efficiency, through greater insulation and building standards, will reduce costs and strain on the energy supply system. Reducing energy use also provides utilities with greater time to shift toward renewable energy supplies.

- Built Green is a green home certification program of the Master Builders Association of King and Snohomish counties that supports sustainable construction techniques for residential development.
- LEED, developed by the U.S. Green Building Council, is a widely used green building rating system.
- The Bullitt Center was built to demonstrate how a modern building could essentially eliminate its energy impact by generating energy and being designed for enhanced efficiency in every aspect. It goes well beyond the green building standards to show what's possible today.

Green building design and codes traditionally target new construction. This has the potential to leave unaddressed the existing homes and businesses that make up most of the urban environment. Successful energy efficiency programs will also look to identify and address needs of existing buildings and business operations.

The Municipal Research and Services Center has helpful resources related to building energy use, including local agency examples and information on state regulations and programs.

CLIMATE CHANGE RESILIENCE – ADAPTING TO, AND PREPARING FOR, CLIMATE IMPACTS

The expected impacts from climate change – whether due to changes in temperature, precipitation, sea level or other factors – are varied throughout the region and affect many aspects of the environment. These impacts may affect people and communities in a variety of ways, e.g., from increases in flooding, extreme heat, droughts, wildfires, as well as impacts to infrastructure, the economy and human health. Of particular concern are impacts to people who may be at greater exposure and have fewer resources to respond and recover.

Many organizations, academic institutions and government agencies are planning for and taking actions to build resilience across the region. Data, tools and other resources are available to assist jurisdictions in improving resilience within their own communities. Resilience in this context is defined as the ability to prepare, plan for, and recover from adverse events and circumstances.

The Puget Sound Climate Preparedness Collaborative is a voluntary consortium of organizations – including local and tribal governments, regional agencies, academic institutions and others – to share knowledge and coordinate efforts to advance climate preparedness and resilience. Links to various climate plans, data, tools and case studies are available on their website.

The University of Washington Climate Impacts Group also provides resources for local agencies and decision makers, including a variety of data sets and analysis tools. These cover topics such as temperature, precipitation and sea level rise projections among others. UWCIG is also working on a climate change scenarios tool for local governments.

The specific VISION 2050 policies related to resilience and climate preparedness are attached to this guidance document, and these policies are summarized and further discussed below. There are numerous and diverse sectors and topic areas that are relevant to this issue, and each brings its own unique set of data and policy needs. In addition, each may involve distinct departments or partnerships within a local jurisdiction, bringing specific skill sets and knowledge to bear. For example, coordinating with the work being done under your city or county's Emergency Management Department is strongly encouraged.

As mentioned, a variety of tools and resources exist or are actively being prepared by partner organizations. To avoid duplication and to streamline this guidance document to the extent possible, the VISION 2050 policies related to resilience are grouped into themes and a high-level overview, examples and additional specific resources are provided for each.

Protecting, Enhancing and Restoring the Natural Environment

VISION 2050 includes four climate resilience related policies addressing the protection, enhancement and restoration of various aspects of the natural environment. These include urban tree canopy, forests, farmlands, wetlands, estuaries, hydrologic systems and water supply. *Refer to MPP-EN-9, MPP-CC-4, MPP-CC-9, and MPP-PS-21.*

Each community will have their own unique resources within their borders to protect, enhance and restore. Examples and guidance regarding two of these resources are provided here – urban tree canopy and wetlands.

Urban Tree Canopy

For those unfamiliar with the term "urban tree canopy," according to the U.S. Forest Service urban tree canopy is the leafy, green, overhead cover from trees as seen from above. Urban tree canopy can provide shade, wildlife habitat, fruit production, energy conservation, stormwater mitigation, visual aesthetic, and public health and educational value.

Jurisdictions can "enhance" urban tree canopy through both preservation of existing canopy and planting of new urban trees. Jurisdictions may also benefit from developing an inventory and conducting regular monitoring of tree canopy, as well as using other data and analysis tools to address where tree canopy is lacking or requires attention – for example, by reviewing existing tree canopy in areas with higher proportions of people of color or people with low incomes, near schools or daycares, etc.

Below are some examples of how jurisdictions are addressing urban tree canopy in comprehensive plans.

- The City of Bainbridge Island includes policies related to tree retention and planting, and addresses tree canopy in the planning areas for air quality, forests and trees, land use and the preservation of open space. Policies also call for periodic inventories and monitoring to assess canopy cover and health. In addition, the City has policies that encourage private property owners to preserve trees as part of the review of development applications and includes certain incentives. The plan also includes development of street tree programs for more densely developed areas of the city.

- Some cities have "Urban Forest Management Plans," which guide the management of the urban forest in their community and sets goals and action steps to achieve them. The City of Sammamish has one such example, adopted in 2019, which now includes implementation strategies and a biennial workplan, with an annual State of the Urban Forest Report. The City received a grant to work with the University of Washington and a consultant to complete a full canopy cover assessment using GIS, to understand existing resources and establish a benchmark against which to measure future progress in meeting established goals from the plan. An interactive "Story Map" was developed including information on canopy, fragmentation, health, priority planting areas and other issues.

There is a wide variety of opportunities to implement this policy to enhance urban tree canopy within each jurisdiction. On a larger, more resourced scale, this can include development of a detailed inventory and analysis of tree canopy throughout the community, using GIS and other analytical tools. Policies can span multiple areas within a comprehensive plan, noting the connection and benefits of urban tree canopy to land use, air quality, urban forests and other sectors. Specific programs and plans to monitor the health of existing trees and provide for new plantings may be put into place. Modifications to local regulations or development codes may be implemented to encourage preservation of tree canopy.

On a smaller, less resourced scale, policies and programs can still be put into place to have a meaningful impact on the preservation and enhancement of urban tree canopy. This can include policies signaling the goal and intention to preserve and enhance street trees and urban forests; ensuring tree requirements are set to the goals of your community during development review; or working with community groups on tree planting programs.

Some additional resources that may be useful:

* Municipal Research and Services Center, Urban Tree Canopy resources

* U.S. Forest Service Urban Tree Canopy Assessment

* WA Department of Natural Resources, Urban Tree Canopy data in King, Pierce and Snohomish Counties

* PSRC's Conservation Toolkit and Regional Open Space Conservation Plan

Hydrology

A number of VISION 2050 policies address the protection and restoration of the region's water systems, including wetlands, estuaries, fisheries, and hydrological functions. These are cross-cutting policies that provide a variety of environmental and societal benefits, as well as address both the impacts from, and resilience opportunities to, climate change.

Below are some examples of how jurisdictions are addressing the protection of these systems in comprehensive plans.

* Snohomish County's comprehensive plan includes goals, objectives and policies related to the protection and management of critical areas, shorelines and water. For example, policies to protect water resources and watersheds call for strategies such as encouraging alternative impervious surface techniques, providing for the retention of natural vegetation, developing watershed management plans and utilizing low impact development techniques.

* The City of Bellingham is developing a mitigation program to address impacts from growth and infrastructure on wetlands and streams. The goals of the program are to reduce costs, coordinate efforts and streamline the process to improve the overall success of mitigation projects. The city provides summary references specific to their watersheds, as well as more detailed data. In addition, a mitigation bank is being developed to provide credits for purchase by public and private developers.
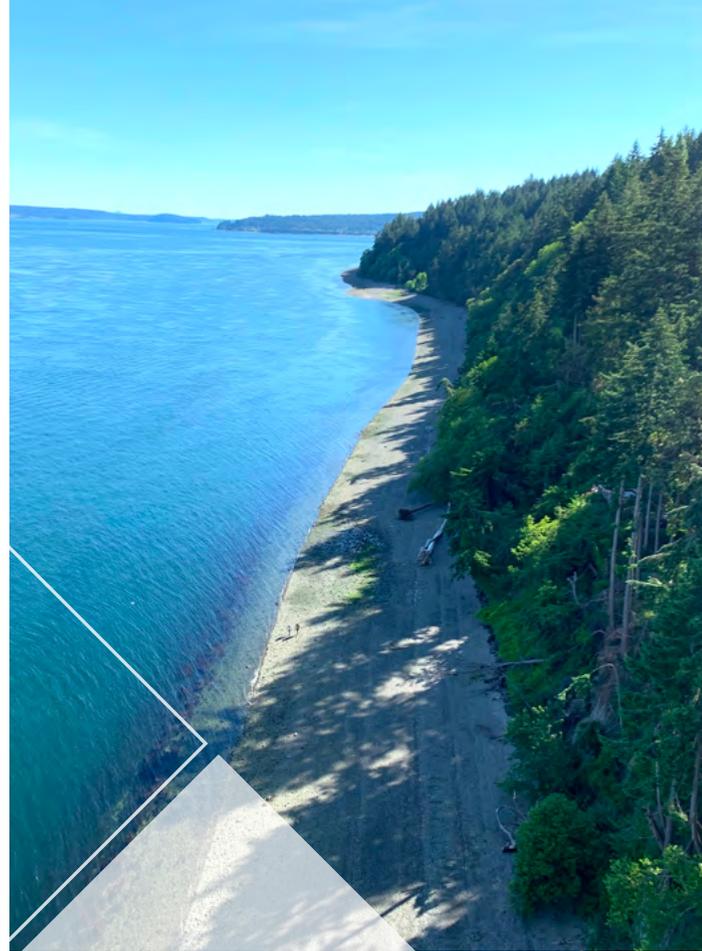
The extent to which each jurisdiction incorporates policies and strategies on this topic will be dependent on the needs specific to their community and watersheds. Activities may span from the beginning of the process – e.g., identifying and mapping watershed and stream locations and their risk factors – to more detailed data collection and assessments, and then move forward to policy, regulatory and funding tools.

Some additional resources that may be useful:

- Washington State Department of Ecology, Water and Shorelines
- Puget Sound Partnership, 2022-2026 Action Agenda
- U.S. Fish and Wildlife Service, National Wetlands Inventory and Wetlands Mapper
- U.S. EPA, Healthy Watersheds Protection
- Association of State Wetland Managers, Urban Wetlands Protection and Restoration Guide

General Resilience Policies and Regional Coordination

VISION 2050 includes policies addressing resilience more broadly. These policies touch on overall actions to support resilience, promoting cooperation and coordination, and ensuring the region's economy and the natural and built environments are protected and sustainable. *Refer to MPP-CC-7, MPP-CC-8, MPP-DP-17, MPP-Ec-16, and MPP-T-31.*

Regarding the policies specific to the region's economy and the establishment of emerging industries to enhance sustainability and resilience, the reader is referred to PSRC's Economic Development Element Guide for further guidance.

In general, the theme of these policies involves coordinated planning efforts, both within and external to each jurisdiction. As noted earlier, key resources may exist within each city or county; for example:

- The Pierce County Hazard Mitigation Plan addresses both the unincorporated county but also contains 80 local jurisdictions' mitigation plans. These plans are coordinated through the Federal Emergency Management Agency (FEMA) and are a requirement to pursue FEMA mitigation grants.
- Public Health – Seattle and King County has a variety of data and reports available, including city health profiles providing demographic, social and health indicators for each city in King County.
- Many cities and counties have already developed climate action plans, addressing mitigation, adaptation/resilience or both. For example, in 2020 Kitsap County in collaboration with the cities of Bremerton and Port Orchard published a Climate Change Resiliency Assessment.

PSRC recommends each jurisdiction conduct an inventory of resources and planning efforts available within each city or county as they embark on this work. Key departments include Emergency Management, Planning, Public Works, Sustainability, Health, Natural Resources, Parks and Recreation, etc.

An example of a coordinated planning effort with multiple partner agencies is the Qwuloolt Estuary Restoration Project. The purpose of the project was to return the site to its natural condition and help in the recovery of endangered chinook salmon and other species. A partnership of organizations including the Tulalip Tribes, City of Marysville, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, Washington State Department of Ecology, and other federal and state agencies developed a restoration plan that culminated in 2015 with the breach of the Ebey Slough levee that restored tidal flow to the estuary.

Protecting Vulnerable Populations

VISION 2050 includes a specific climate resilience policy addressing impacts to vulnerable populations and areas that have been disproportionately affected by climate change *(CC-6)*. However, other policies are contained throughout VISION 2050 that also address mitigating impacts to and protecting vulnerable populations *(e.g., CC-8)*. As written, these policies are fairly broad and may encompass a variety of impacts, depending on the unique circumstances within each community.

There are many resources communities may use to identify vulnerable populations. PSRC provides interactive web maps with information on the region's demographics, including areas with a higher proportion of people of color, people with low incomes, older adults, youth, people with disabilities, and people with Limited English proficiency. The corresponding U.S. Census data behind the regional demographic data is also available on PSRC's website.

- PSRC's Demographic Profile

- An interactive view of this data may be found in PSRC's Transportation System Visualization Tool

Regarding areas that have been disproportionately impacted, one useful resource may be the Washington Environmental Health Disparities (WAEHD) Map. The WAEHD map provides indicator data related to environmental exposures, environmental effects, sensitive populations and other socioeconomic factors. Another useful tool might be PSRC's Displacement Risk Map.

Identifying disproportionate impacts experienced from climate change, specifically, may be more challenging as jurisdictions consider how to address this issue in comprehensive planning and implementation of projects and programs. It may be helpful to begin with an understanding of what impacts from climate change your community is expected to experience. Every community will have their own unique challenges – some may be experiencing increased flooding, others may be more concerned about extreme temperatures, and some may identify worsening air quality and impacts to health as their biggest climate change issue to address. The tools and data sources referenced at the beginning of this section will assist jurisdictions in identifying these potential impacts.

Whether an area or group is considered vulnerable and is or may be disproportionately impacted may be determined by factors such as proximity to the hazard or risk; the existence of fewer options for evacuating or moving out of harm's way; fewer resources available to cope with or absorb a financial loss; or other social or health impacts that may impact the ability to respond and recover quickly. These factors align with attributes such as income, health, reliance on public transportation, etc.

Below are some examples of how jurisdictions are addressing this topic.

- Broward County, Florida has adopted a policy to "consider the public health consequences of climate change, such as extreme temperatures and vector-borne diseases, and take steps to build capacity to respond to or prevent those consequences." They then identify goals and action steps to be taken by 2025, including research to better understand impacts to public health from climate change; evaluating the capacity of existing public health and emergency response resources; tracking and monitoring health impacts and to consider them in plans, programs and policies; creation of a public health climate change adaptation plan; expanding education and awareness; and other initiatives.

- The City of Everett's Climate Action Plan includes goals, strategies and actions for mitigating climate change and reducing emissions but prioritized based on other factors such as the potential increase for community resilience to the impacts of climate change and the potential for a positive impact on equity. Two examples of this lens include a strategy to provide more open space and parks, and encouraging the use of green roofs, cool pavement and landscaping to mitigate urban heat island effects among other risks.

- The City of Asheville, North Carolina's "Planning for Climate Resilience" study evaluated five geographic areas of the city and described their localized risks from climate change. For example, in their downtown area they described an area with a large amount of paved surfaces and higher daytime temperatures, with a risk to vulnerable populations susceptible to extreme heat. Proposed actions include the planting of more trees and providing education on proactive personal resilience to extreme heat.

The application of this policy within each community will be very tailored and varied in breadth and scope. Jurisdictions are encouraged to review the available resources within their own area – e.g., established

city or county Hazard Mitigation Plans, Emergency Management Plans, resources from public health departments, etc.

On a larger, more resourced scale, jurisdictions may choose to conduct a full and detailed analysis of climate risks and vulnerable populations, utilizing GIS and other tools. The resources mentioned above may be useful data for this work. Communities are then encouraged to develop policies and programs to address those potential impacts to vulnerable populations or those disproportionately impacted, based on the unique needs and set of solutions within each area.

On a smaller, less resourced scale, policies and programs can still be put into place. In the absence of a full inventory or analysis, a good place to start may be with an understanding of the potential climate risks within your own community – e.g., using existing resources through your city, county, regional entities or the state. Understanding the varied population groups within your community, and those areas that are less resourced and potentially more vulnerable is an important first step. Then depending on the goals of the community and available resources, a plan to address these potential impacts and achieving future desired outcomes can be developed.

In addition to the resources mentioned above, a useful background report is EPA's study on Climate Change and Social Vulnerability in the United States, which identifies areas that are forecast to experience the highest climate change impacts for several factors and estimates the likelihood of vulnerable populations to be living in those areas.

In summary, there are various tools and data sources to assist jurisdictions in identifying vulnerable populations within their community and those that may be disproportionately impacted by climate change. There are also various resources to assist in the identification of those potential impacts, and opportunities at all scales to begin this assessment. Examples and best practices also exist to develop plans, policies and actions to mitigate impacts, specifically to vulnerable populations, depending on the risk factor.

Some additional resources that may be useful:
- National Academies of Sciences, Engineering and Medicine, Resilient America Roundtable
- U.S. EPA, Strategies for Climate Change Adaptation
- Municipal Research and Services Center, examples of Climate Impact Preparedness, Adaptation and Resilience
- PSRC's interactive Regional Hazards Map

Siting and Resilience of Infrastructure

VISION 2050 has two policies related to the location of public services and key infrastructure at risk of climate change impacts such as sea level rise and other disasters. *Refer to MPP-CC-10 and MPP-PS-19.*

These policies will be addressed by jurisdictions depending on their own unique natural and built environments. The tools and data previously referenced in this document – location of natural hazards, PSRC's transportation system condition visualization tool, demographic data, University of Washington climate data, etc. — are valuable tools to help support these planning efforts.

The resources and best practices related to coordination and collaboration will also be helpful when considering the needs specific to each community. In addition, the U.S. Climate Resilience Toolkit provides case studies and other resources regarding a variety of climate impacts and across various topics. A few examples are provided below:

- A new approach by the Colorado Department of Transportation to rebuilding roadways after historic flooding events, to maximize resilience.
- The City of Fredericktown, Missouri is using EPA's "Creating Resilient Water Utilities" program to develop plans to address threats to their water supply.

Siting infrastructure and preparing for hazards can ensure that critical community elements survive hazard events and that a community is able to recover quickly. Keeping key transportation infrastructure operable allows emergency services to be able to function during an event and allows recovery services to reach a community in the immediate period afterwards. The siting, design, and preparation of electrical, water, and stormwater utilities will also play an important role in how a community is able to respond and recover from a hazard event. Police, fire, and emergency services should be located and built to remain operable and accessible to the community.

Assessing and preparing for hazards can be an integral part of each community's transportation planning process. Transportation investments can strengthen community connections and provide alternative access options. Maintaining infrastructure in a state of good repair and strengthening at risk facilities can also serve to enhance resilience.
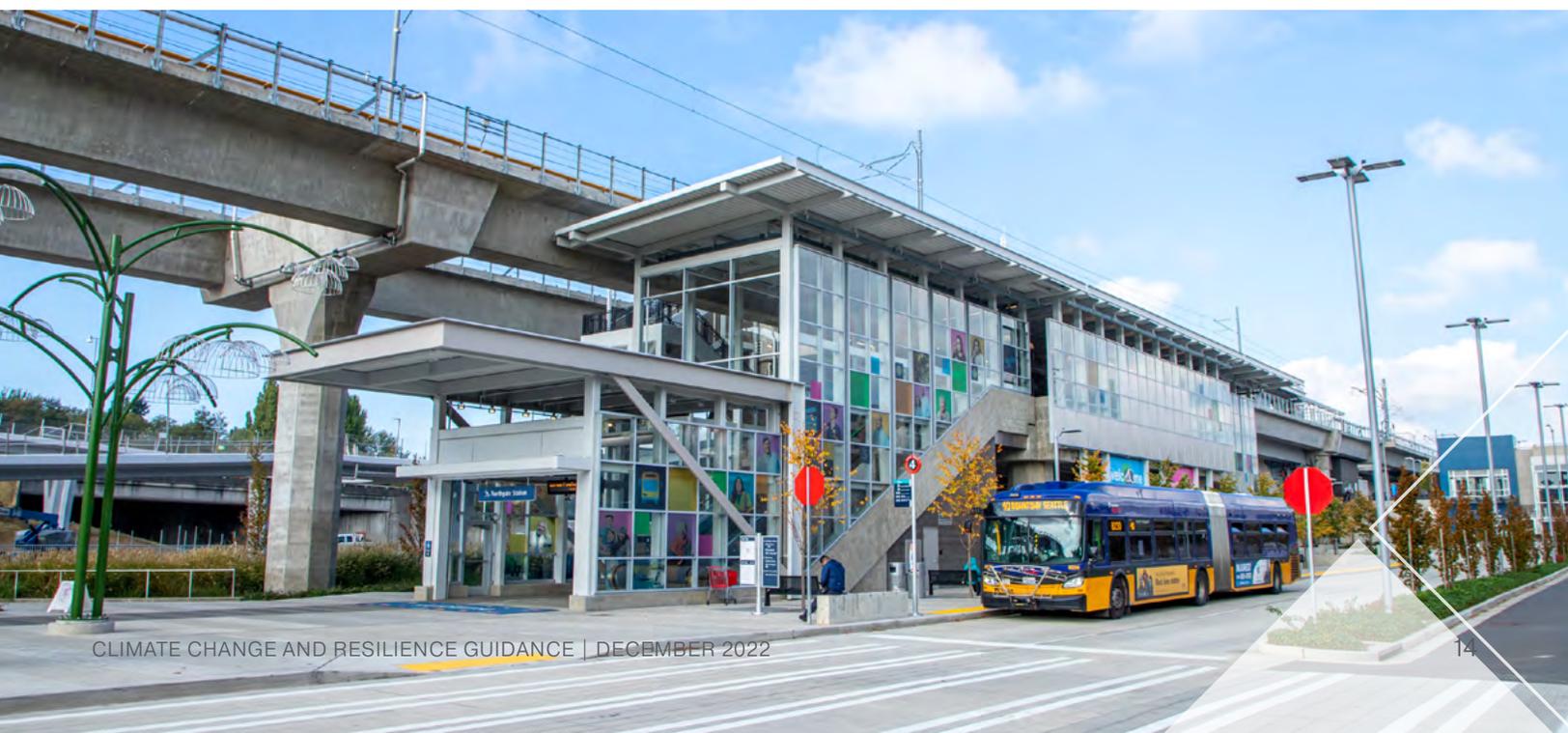
Next Steps and Upcoming Work

PSRC is working on several projects with partner agencies that address climate and resilience, for example the Regional EV Collaborative Clearinghouse and the Puget Sound Regional Emissions Analysis Project. Once these efforts are complete, links will be provided and sent to stakeholders to inform their work.
In addition, the WA Department of Commerce is working on climate guidance, including development of tools and model elements for plans. Drafts are expected to be available in mid-2023 for review.

Lastly, monitoring the effectiveness and implementation of policies is an important and ongoing role. This will ensure community goals are on track and provide accountability to the public and stakeholders on various issues. PSRC has a robust suite of data and analysis tools that are continually being updated and trends are reported at various scales, to assist with both regional and local planning. Many of these resources are noted in this document, but additional information can be found on [PSRC's website](#).

VISION 2050 GREENHOUSE GAS EMISSION REDUCTION POLICIES

MPP-CC-1:   Advance the adoption and implementation of actions that substantially reduce greenhouse gas emissions in support of state, regional, and local emissions reduction goals, including targets adopted by the Puget Sound Clean Air Agency.

MPP-CC-2:   Reduce building energy use through green building and retrofit of existing buildings.

MPP-CC-3:   Reduce greenhouse gases by expanding the use of conservation and alternative energy sources, electrifying the transportation system, and reducing vehicle miles traveled by increasing alternatives to driving alone.

MPP-CC-5:   Pursue the development of energy management technology as part of meeting the region's energy needs.

MPP-CC-11:   Support achievement of regional greenhouse gas emissions reduction goals through countywide planning policies and local comprehensive plans.

MPP-CC-12:   Prioritize transportation investments that support achievement of regional greenhouse gas emissions reduction goals, such as by reducing vehicle miles traveled.

VISION 2050 RESILIENCE POLICIES

Protecting, Enhancing and Restoring the Natural Environment

MPP-En-9:   Enhance urban tree canopy to support community resilience, mitigate urban heat, manage stormwater, conserve energy, improve mental and physical health, and strengthen economic prosperity.

MPP-CC-4:   Protect and restore natural resources that sequester and store carbon such as forests, farmland, wetlands, estuaries, and urban tree canopy.

MPP-CC-9:   Identify and address the impacts of climate change on the region's hydrological systems.

MPP-PS-21:   Consider the potential impacts of climate change and fisheries protection on the region's water supply.

General Resilience Policies and Regional Coordination

MPP MPP-CC-7:   Advance state, regional, and local actions that support resilience and adaptation to climate change impacts.

MPP-CC-8:   Increase resilience by identifying and addressing the impacts of climate change and natural hazards on water, land, infrastructure, health, and the economy. Prioritize actions to protect the most vulnerable populations.

MPP-DP-17:   Promote cooperation and coordination among transportation providers, local government, and developers to ensure that joint- and mixed-use developments are designed to promote and improve physical, mental, and social health and reduce the impacts of climate change on the natural and built environments.

MPP-Ec-16:   Ensure that economic development sustains and respects the region's environment and encourages development of established and emerging industries, technologies, and services, that promote environmental sustainability, especially those addressing climate change and resilience.

MPP-T-31:   Advance the resilience of the transportation system by incorporating redundancies, preparing for disasters and other impacts, and coordinated planning for system recovery.

Protecting Vulnerable Populations

MPP-CC-6:   Address impacts to vulnerable populations and areas that have been disproportionately affected by climate change.

Siting and Resilience of Infrastructure

MPP-CC-10:   Address rising sea water by siting and planning for relocation of hazardous industries and essential public services away from the 500-year floodplain.

MPP-PS-19:   Support efforts to increase the resilience of public services, utilities, and infrastructure by preparing for disasters and other impacts and coordinated planning for system recovery.