Washington State Department of Commerce

DRAFT

Model Climate Element: Resilience Sub-Element Planning Guidance

CLIMATE PROGRAM

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3C: Resilience Sub-element

3C.1: Overview

Washington's cities and counties may voluntarily use the Resilience Sub-element's Planning Guidance (Resilience Guidance) to develop and implement plans, goals, and policies that build communitywide climate resilience and equity. The Resilience Guidance will help jurisdictions to identify and address natural hazards exacerbated by climate change, including landslides, floods, droughts, wildfires, and other impacts of changes to temperature, precipitation, and sea levels. The Resilience Guidance and its companion resources also will show jurisdictions how to identify, design, and invest in traditional and "green" infrastructure — for example, curb-side bioswales — as well as conserve and protect natural areas that provide habitat for fish and wildlife.

The Resilience Guidance provides a common planning framework, with six **steps** and flexible **pathways** included, to help local governments assess climate-exacerbated hazards and address impacts via comprehensive plan goals and policies [*Figure 1*].

Defining Climate Resilience

The federal government's U.S. Climate Resilience Toolkit defines resilience as "*the capacity of a jurisdiction, business, or natural environment to prevent, withstand, respond to, and recover from a disruption*." Washington's cities and counties may build climate resilience by implementing a mix of preparedness, response, and recovery policies, including mitigating natural hazards, adapting to unavoidable impacts, and restoring degraded natural areas that provide key ecosystem services. See Appendix **##** for a glossary of these and other terms used in this guidance.

U.S. Climate Resilience Toolkit

Figure 1: Steps and pathways to integrate climate resilience into comprehensive plan

At least once every 10-year comprehensive plan periodic update cycle, Washington's cities and counties should review their optional Climate Element — and revise it, as needed — to incorporate the best available science[1] and updated climate modeling. This means a jurisdiction should take the Resilience Sub-element Planning Guidance's first three foundational steps to explore local climate impacts, identify resilience policy gaps, and determine the appropriate next step: A jurisdiction may want to proceed directly to Step 4 and conduct a climate vulnerability and risk assessment; or, a jurisdiction may be ready to skip to Step 5 [*Pursue Pathways*] to select new or revised policies for integration into the comprehensive plan [*Step 6*]. A jurisdiction may choose its pathway(s) based on its staff capacity, body of climate work, budget, and other considerations.

The Pathways Approach Provides Flexibility and Recognizes Existing Work

Below are a few examples of how Washington jurisdictions — ranging in size, capacity, and existing climate planning work — could follow the flexible pathways approach for integrating climate resilience into a comprehensive plan:

A **small jurisdiction** with a limited budget and staff capacity could use the Resilience Guidance to explore local climate impacts, audit the existing comprehensive plan and related plans, select appropriate resilience goals and policies from Commerce's **Menu of Measures** [*Pathway 2*], and integrate them directly into the comprehensive plan.

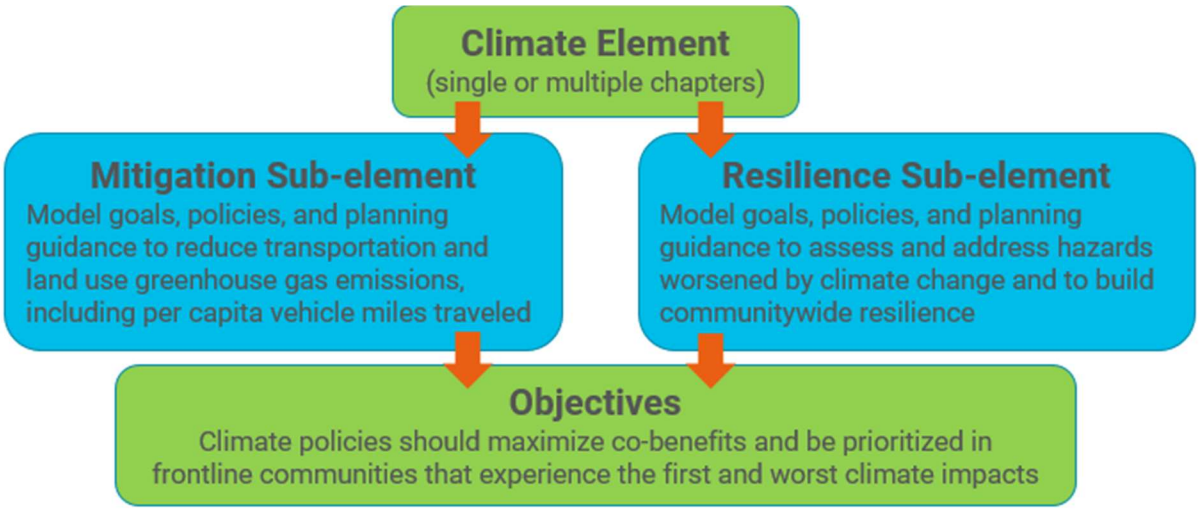
A **mid-size jurisdiction** with more staff capacity could use the Resilience Guidance to conduct a climate vulnerability and risk assessment and then update goals and policies in its existing hazard mitigation plan [*Pathway 4*]. The jurisdiction could then adopt its updated hazard mitigation plan, by reference, in the comprehensive plan.

A **large jurisdiction** with an existing climate action plan could use the Resilience Guidance to audit its comprehensive plan and then integrate resilience goals and policies from its climate action plan and Commerce's **Menu of Measures** into the comprehensive plan [*Pathways 1 and 2*].

Creating a Complete Climate Element

As explained previously [*Section* **##**], a Climate Element's principal pieces are the Resilience Sub-element and a companion emissions Mitigation Sub-element [*Figure* **##**]. Your jurisdiction may choose to consolidate all of its climate goals and policies into one chapter or to disperse them into other chapters/elements (Land Use, etc.).

Figure 2: Model Climate Element Overview



[11] RCW 36.70A.172

Resilience Sub-element: This sub-element is considered complete if it includes at least one climate resilience goal and supportive policy within each of the Climate Model Element's 11 sectors:

- **Agriculture** (includes production and distribution);
- **Buildings & Energy** (includes generation, transmission, and consumption);
- **Cultural Resources & Practices** (includes historic sites and cultural resources and practices);
- **Economic Development** (includes business continuity, opportunities);
- **Emergency Management** (includes preparedness, response, recovery);
- **Human Health** (includes community well-being and engagement);
- **Ecosystems** (includes terrestrial and aquatic species, habitats, and services);
- **Transportation** (includes multimodal travel and infrastructure);
- **Waste Management** (includes materials recycling and disposal);
- **Water Resources** (includes water quality and quantity);
- **Zoning & Development** (includes site use, design, and other development facets).

The total number and nature of your jurisdiction's specific climate resilience policies will be based on your assessment of local climate impacts and needs [*Steps 2-4 of the Resilience Guidance*].

Mitigation Sub-element: This sub-element should include measures with a demonstrated ability to reduce greenhouse gas emissions and per capita vehicle miles traveled. Your jurisdiction does not need to have an emissions mitigation goal and policy within all of the Model Element's 11 sectors, as the mitigation planning pathway your jurisdiction chooses will determine your mix of mitigation goals and policies [*See Section 3B*].

Meeting climate policy objectives

Your comprehensive plan's climate mitigation and resilience policies should meet the following objectives:

- **Objective 1— Policy Co-benefits:** Your Climate Element should recognize and promote co-benefits — the added benefits we get when we act to control climate change, above and beyond the direct benefits of a more stable climate.[2] All **Menu of Measures** policies have at least one of the following co-benefits: reduces emissions; sequesters carbon; enhances resilience; improves salmon recovery; promotes economic development; promotes equity and justice; provides cost savings; provides ecosystem services; protects tribal treaty rights; improves public health and well-being; improves air quality; and, builds knowledge.
- **Objective 2 — Policy Prioritization:** Your Climate Element should prioritize policies in frontline communities that will suffer disproportionately from compounding environmental impacts and will be most impacted by natural hazards due to climate change. Section **##** describes the **Menu of Measures**' multicriteria analysis prioritization framework. Jurisdictions may use the framework to prioritize their Climate Element policies.

Helping with policy development and implementation

Commerce's online **Climate Dashboard** includes planning resources, including: a prioritized menu of model climate goals and policies (**Menu of Measures**); an example of a **Climate Chapter**; a comprehensive plan integration checklist (**Climate Element Checklist**); and, climate planning and policy design, funding, and implementation tools (**Resources Library**). Commerce staff also can provide technical planning and funding assistance to help ensure your Climate Element is complete and consistent with other comprehensive plan elements.

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[2] Smith, Allison. The Climate Bonus: Co-benefits of Climate Policy. Milton Park, Routeledge, 2013.

3C.2: Model Climate Resilience Planning Guidance

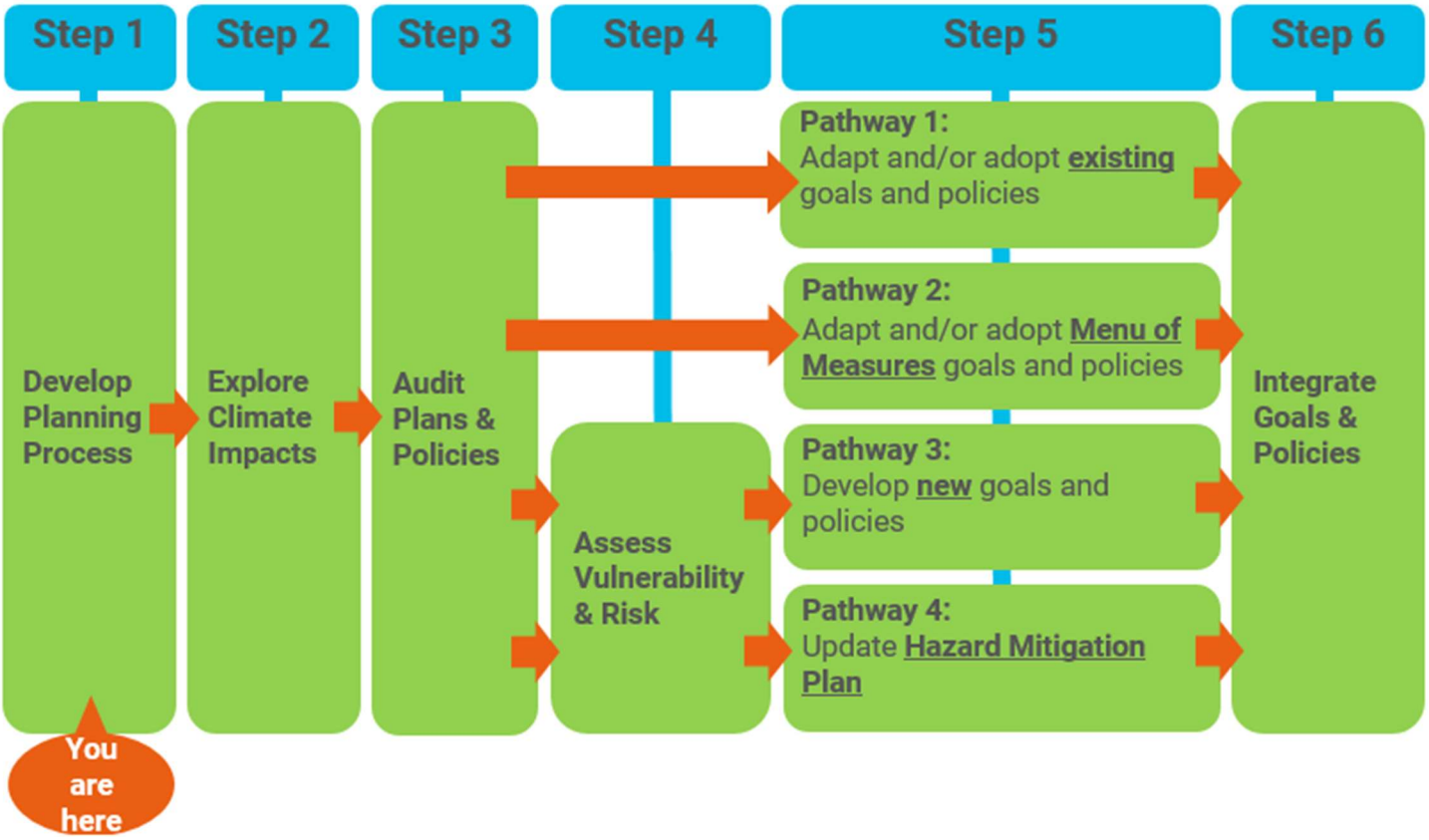
The Resilience Guidance adapts the federal government's U.S. Climate Resilience Toolkit planning framework and integrates best practices recommended by the Association of Washington Cities (AWC), Municipal Research and Services Center of Washington (MRSC), American Planning Association (APA), and other organizations. The Resilience Guidance provides an iterative, yet flexible, approach for jurisdictions to explore climate science, assess impacts on local sectors and assets, and consider resilience goals and policies. The Resilience Guidance is divided into six steps [*See below*]. The first three foundational steps and the final integration step are linked by flexible risk-assessment and policy-development pathways.

Model Framework for Climate Planning

- **Educate:** Raise awareness and understanding of climate risks by educating key decision-makers.
- **Analyze:** Use science and local information to assess risks and likely climate impacts that matter to your city.
- **Act and adjust:** Take multisectoral, adaptive, responsive, and flexible actions to manage and address those risks, then learn and adjust as needed.

Association of Washington Cities *Climate Resilience Handbook*

Step 1: Develop Planning Process



In this **first of three foundational steps**, your jurisdiction will select a project lead, assemble a planning team, develop a scope of work, and recruit a diversity of community members to participate in the project. Given the technical nature of climate change — as well as the enduring need to incorporate the best available science and updated climate modeling — it is important to form an interdisciplinary team to complete work on the Resilience Sub-element and companion emissions Mitigation Sub-element [*See Section 3B*] during each comprehensive plan periodic update cycle. Just as important, this Climate Element team should coordinate

with your jurisdiction's broader planning and public-engagement efforts associated with updating housing, land use, transportation, and other comprehensive plan elements.

Task 1.1: Designate project lead

Your project lead should be a staff member with the jurisdiction's authority to manage the project, coordinate stakeholders, and champion comprehensive plan integration of climate goals and policies.

- Use the Resilience Guidance's companion **Resilience Planning Workbook** [*See Appendix* **##**] to complete this task and subsequent ones. The Workbook, which may be adapted to suit your jurisdiction's needs, is designed for your internal use and does not need to be submitted to Commerce upon the completion of your work.

Task 1.2: Assemble a project team

Your team should include public-sector partners who have the authority to regulate development and/or who are involved with hazard mitigation, public health, transportation, community engagement, and other areas with a climate nexus [*See example, right*]. This core team — which could include local and regional government staff members and elected officials — will lead the planning work and integrate input from community stakeholders.

- Use the **Resilience Planning Workbook** to list your project team's members.

Task 1.3: Scope budget and schedule

Scope out a two-phase budget and schedule. Phase 1 is the first three steps, and Phase 2 is last three steps.

- Plan for regular project team meetings, as well as periodic briefings with your jurisdiction's elected council or commission so it is prepared to provide your team direction at key decision points.

Completing the first three steps [*Phase 1*] will generally cost about a third of your overall budget and take about ## weeks. Depending on your jurisdiction's selected pathway(s), completing the remaining steps [*Phase 2*] will use the remaining share of the budget and take about ## weeks [*See Step 3 for more details*]. Reserve at least 8 weeks in your Phase 2 schedule for public hearings leading to final adoption.

- Use the **Resilience Planning Workbook** to list your project schedule.

Recommended Project Team Partners

Partners with Authority to Regulate Development:

- City Council/County Commissioners
- Planning Commission
- Planning/Jurisdiction Development
- Regional/Metropolitan Planning
- Special Districts

Other Public-Sector Partners:

- Building Code Enforcement
- Local Emergency Management
- Fire Department/Districts
- Floodplain Administration
- Geographic Information Systems
- Parks and Recreation
- Planning/Community Development
- Public Information Office
- Public Works
- Public Health
- Non-profits (e.g., Red Cross)
- Stormwater Management
- Transportation (Roads/Bridges)
- State Emergency Management
- Regional Planning Agency

Adapted from FEMA ***Local Mitigation Planning Handbook***

Task 1.4: Develop public-engagement strategy

Your strategy should enable a diversity of community members to participate in your planning and policy implementation efforts in equitable, meaningful ways. It is important to integrate community members into this first step to provide them agency in shaping and implementing policies that build communitywide climate resilience. As noted previously, it is also important to coordinate your climate public-engagement strategy with any broader public-engagement strategy that is required as part of your comprehensive plan periodic update process.

Defining "frontline" community members

"Frontline community members are people who experience the first and worst consequences of climate change. Such residents' health and livelihoods are often highly vulnerable to climate-exacerbated hazards and economic disruptions, and their communities often lack basic support infrastructure and suffer disproportionately from the compounding impacts of pollution, discrimination, racism, and poverty."

For a more detailed definition of this and other terms used in this guidance, see the glossary in Appendix ##.

- **Establish goals and outcomes:** Start by establishing equity goals and desired outcomes for your engagement strategy. Next, identify the level of decision-making you're giving to community members.
- **Identify and recruit stakeholders:** Climate change does not impact everyone equally.[3] Use the resources below to identify and recruit "frontline" community members — people who experience the first and worst consequences of climate change. Also consider inviting members of neighboring tribes, as well as representatives from local businesses, neighborhood associations, schools, and other groups, to participate in your process and share their technical expertise, cultural perspective, and lived experience.
- **Design an equitable process:** Ask your stakeholders how they want to participate in your process — for example, as part of the core project team, technical or cultural focus groups, or multisector committees. Ensure that all stakeholders have an equitable opportunity to participate collaboratively in your planning process' core steps and policy implementation efforts. Seek out ways to center historically marginalized voices.
- **Support stakeholders:** Effective public participation takes significant time and trust, so consider the following ways to support stakeholders who serve on your core project team and/or committee(s):
  - Pay a stipend for participation in and travel to meetings;
  - Host meetings in the evenings, and provide food and childcare;
  - Offer meeting translation services, and ensure engagement materials are available in multiple languages and formats;
  - Follow up with stakeholders to show them how their ideas have been integrated into goals and policies.

Building Authentic Relationships

"Create a foundation for an ongoing relationship, not a one-off transaction designed to extract information and leave. Once a frontline community has provided input, follow up and show them how their participation has led to tangible results. Community members can also be invited to serve on an advisory or implementation task force."

MRSC, Equity and Engagement in Climate Response

[3] United Nations Department of Economic and Social Affairs working paper (2017), Climate Change and Social Inequality.

- **Engage broader community:** Consider the following ways to educate and engage the broader community about climate impacts and resilience opportunities:

  - Host interactive events (virtual and in-person meetings and site tours of at-risk areas of the community) to educate residents about local climate impacts and how you will integrate resilience and emissions mitigation goals and policies into your comprehensive plan;
  - Participate in other issue-specific forums — for example, about affordable housing and health — to discuss their climate resilience nexus.
  - Work with leaders of frontline community organizations to talk directly with residents about climate change and how your jurisdiction and other partners can help neighborhoods build resilience;
  - Participate in existing community arts and cultural events [*See example below*] to share draft policy ideas and elicit input from residents.

Using festivals, books, and games to engage residents and bolster climate resilience

During Olympia's fall 2017 Arts Walk festival, the Thurston Regional Planning Council (TRPC), Timberland Regional Library, and other partners hosted "Art of Change," a jurisdiction event that merged climate literacy, art, science, and policy. Against the backdrop of an ocean acidification mural painted on downtown's Puget Sound Estuarium building, Timberland staff hosted a "pop-up" library where festival visitors could sign up for a card and check out climate books and films. Olympia staff discussed the City's sea-level rise strategy, while Arts Walk visitors played a TRPC-created board game called "Resilience Road." The collaborative game enabled players to take Thurston Climate Adaptation Plan actions to respond to floods, droughts, and other climate impacts.

- List your community stakeholders and their roles in the **Resilience Planning Workbook**.

Resources:

- The joint **University of Washington-Front and Centered report — An Unfair Share: Exploring the Disproportionate Risks from Climate Change Facing Washington State Communities**[4] — can help you identify potential frontline community stakeholders and address inequities through your planning process and policies. The report explains how community members may be exposed differently to climate change and how race, wealth, education, health status and other factors may affect a person's ability to cope with climate impacts. The report also highlights the types of community strengths, assets, and processes that can build equitable climate resilience.

> "Given the placed-based nature of climate change-related risks, community members are likely to be the experts in developing and deploying solutions that enhance social cohesion, prevent displacement, and bolster community resilience to climate change."
>
> **Excerpt from *An Unfair Share: Exploring the Disproportionate Risks from Climate Change Facing Washington State Communities.***

[4] University of Washington Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and Centered, and Urban@UW report (2018), An Unfair Share: Exploring the disproportionate risks from climate change facing Washington state communities.

- **Antioch University New England's Centering Equity in Climate Resilience Planning and Action**[5] paper recommends additional best practices for balancing power dynamics through participatory planning and centering equity throughout the planning process. The paper's primary intended audience is U.S. Climate Resilience Toolkit users.
- **Puget Sound Regional Council's Equitable Engagement for Comprehensive Plans**, a Vision 2050 planning resource, has four recommendations for conducting equitable engagement: identify communities most impacted; develop public engagement goals and outcomes; establish meaningful relationships; and, remove barriers to engagement. Each recommendation includes strategies and important questions to consider.
- The **National Association of Climate Resilience Planners'** community-driven climate resilience planning framework[6] complements your public-sector process by recommending best practices for how community-based organizations can help residents of vulnerable and impacted communities define for themselves the complex climate challenges they face and the climate solutions most relevant to their unique assets and threats.

> *"Community-driven climate resilience planning builds community leadership and directly connects neighbors to one another in dynamic solutions-oriented processes. This level of social cohesion, civic participation, and ultimately community stewardship, are paramount to genuine climate resilience."*
>
> **Excerpt from the National Association of Climate Resilience Planners' *Community-Driven Climate Resilience Planning: A Framework***

Task 1.5: Develop guiding principles to shape the planning process and outcomes

The purpose of this exercise is to start thinking comprehensively about the social, economic, and environmental places, traditions, and values that matter most to your community members — and articulating why and how your community members want to sustain them in the face of a changing climate.

- The guiding principles could incorporate a vision statement or values your jurisdiction has articulated already in a strategic plan, sustainability plan, comprehensive plan, or other document [*See Figure* **##**]. This is also an opportunity to revisit those statements and values, and to view them through the lens of climate change and equity:
  - Ask your community members to describe their unique perspectives, assets, and challenges related to climate change;
  - Ask them to define what climate resilience and community well-being mean to them;
  - Ask them how the guiding principles — and, ultimately, the comprehensive plan goals and policies — could better serve their communities' unique needs and priorities and leverage their strengths;
  - Ask them how they want to be a partner in implementing climate resilience policies in the community and how your jurisdiction could help.
- List your guiding principles in the **Resilience Planning Workbook**.

[5] Antioch University New England Center for Climate Preparedness and Community Resilience paper (2022), Centering Equity in Climate Resilience Planning and Action.
[6] National Association of Climate Resilience Planners framework (2017), Community-Driven Climate Resilience Planning: A Framework.

Figure ##: Examples of Guiding Principles

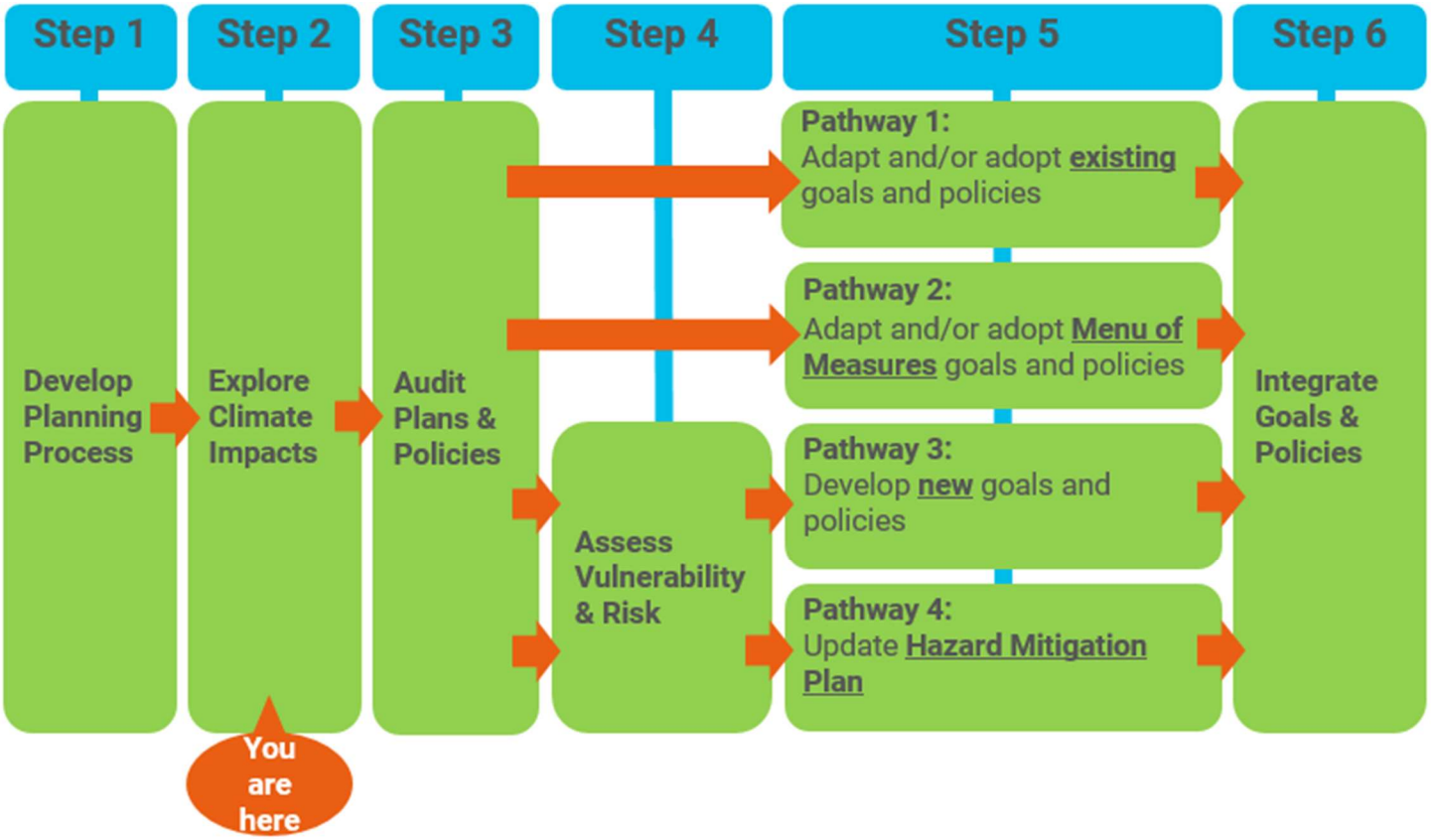
Example 1: Spokane Sustainability Action Plan guiding principles (*2021* draft)

- We seek to provide future generations with a quality of life equal to or better than the quality of life we now are experiencing.
- We seek to bring people and stakeholders together to co-create solutions and move our jurisdiction towards resilience in the face of climate change.
- We believe climate strategies must address historic inequalities and environmental injustices. We will work to undo environmentally racist actions and systems.
- We believe that equitable inclusion is imperative in sustainability planning, therefore we will engage the jurisdiction often and through diverse formats of communication.
- We believe that all people in Spokane should benefit from environmental programs and policies, not just a wealthy few.
- In a time of uncertainty, we seek to help prepare our jurisdiction for the challenges to come. We seek to protect the right of all members of our jurisdiction, human and other than human, to a healthy environment.
- We believe that every action we take must be evaluated for its impact on the climate.
- We believe urgent action is required!

Example 2: Thurston Climate Adaptation Plan guiding principles (*2018*)

- Think in terms of multiple generations and connected built and natural systems, as well as view local and regional decisions through the lens of social, economic, and environmental sustainability.
- Increase resilience through achievable, flexible — and, where possible, measurable and replicable — adaptation strategies and actions that will help the region prepare for and cope with climate change impacts.
- Be responsive to immediate and long-term climate impacts — both emergencies and opportunities.
- Identify and leverage climate change adaptation strategies and actions with mitigation co-benefits, such as reducing, capturing, and storing greenhouse gas emissions.
- Utilize sound scientific research, scenarios modeling, economic analysis, and other tools to analyze regional and local climate change vulnerabilities, risks, and solutions.
- Incorporate and complement work produced by others, including the Natural Hazards Mitigation Plan for the Thurston Region, Sustainable Thurston, Thurston Thrives, and Olympia sea-level rise analyses.
- Consider the impacts of climate change adaptation recommendations on the region's economy, environment, and society; this includes all urban and rural communities — especially vulnerable residents — and the ecosystem benefits provided by natural systems.
- Recognize and strive to protect local indigenous tribes' jurisdiction health and well-being, including natural resources security and self-determination.
- Seek broad jurisdiction input, as well as educate residents about climate change and inspire them to take action.

Step 2 — Explore climate impacts



In this **second of three foundational steps**, your jurisdiction will use a University of Washington Climate Impacts Group (UW CIG) online planning tool — and other resources, as needed — to build baseline awareness of how climate change is expected to affect your community's sectors (agriculture, transportation, etc.) and their built, natural, and social assets in coming decades. Your jurisdiction will apply this knowledge in Step 3.

Task 2.1: Explore changes in the climate

Explore expected changes in the climate and climate-related hazards (drought, flooding, etc.) to identify how they could impact your community (ecosystem degradation, infrastructure damage, etc.). Consider changes in your community in both the near-term (20 years) and long-term (more than 20 years), recognizing that planning may be required now to accommodate changes that are expected in coming decades.

Integrating climate science into planning

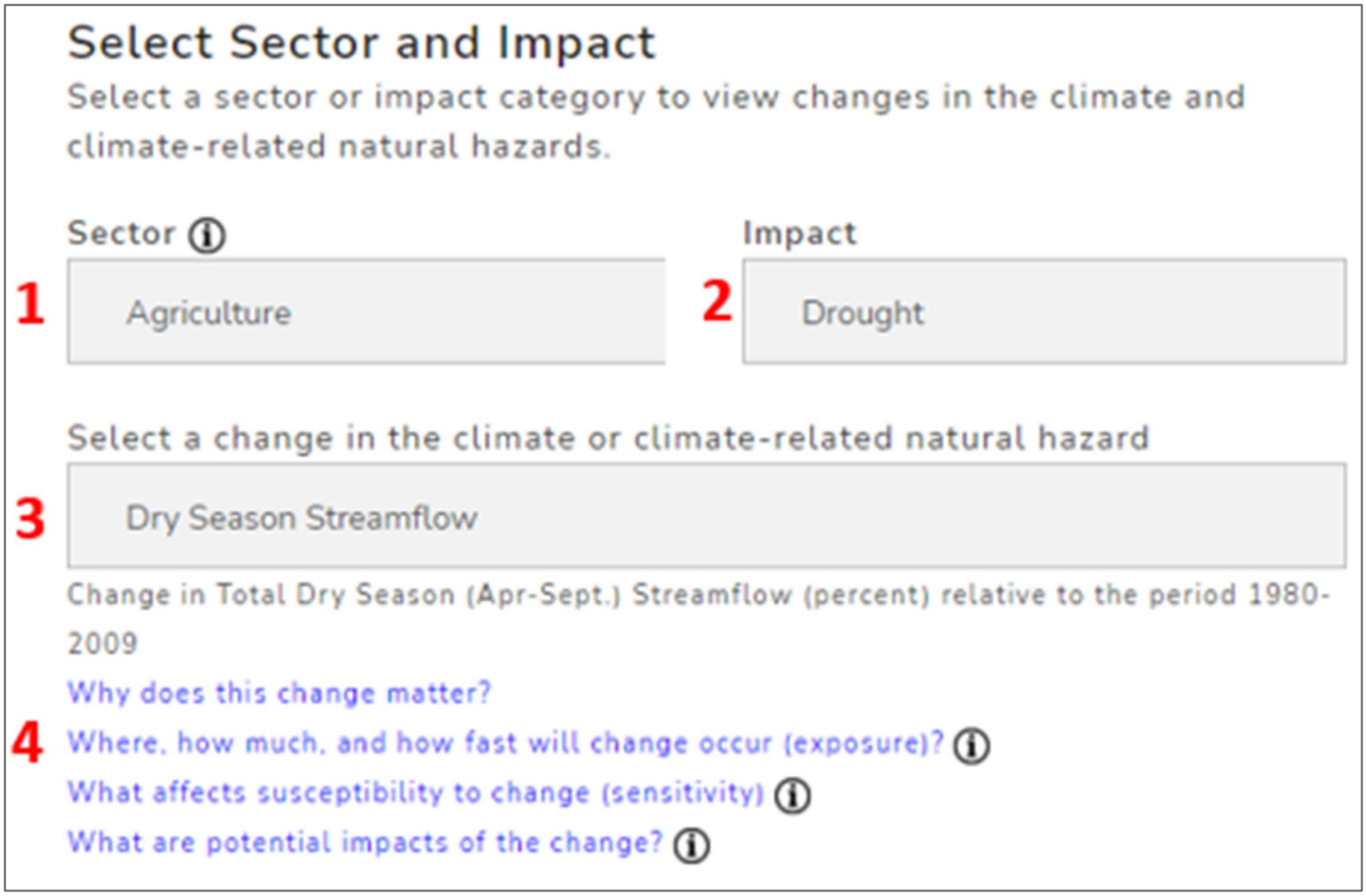
"Comprehensive plans are more than just visioning documents for the future. They tend to be legally adopted by the local decision-making body, can require alignment with existing regulations and clear linkages with future infrastructure investments, and can spur the community to rewrite codes and regulations. Embedding climate science and information into plans can therefore be a trigger for more in-depth analysis as plan recommendations become a reality. Collecting and applying data … is therefore crucial to plans and processes that are informed by future climate conditions."

American Planning Association guidebook: *Using Climate Information in Local Planning*

Using online tools to explore local climate impacts

The UW CIG's online tool guides your jurisdiction through exploration of local climate impacts and when to utilize additional resources to address potential information gaps [*See Additional Resources, below*]. The UW CIG tool displays and summarizes changes in Washington's climate at the county level. Users have the option to download the data, tables, and text descriptions of the changes for the county in which they are located.

- **Process:** The following section recommends the order of UW CIG tool steps a jurisdiction should take to explore local climate impacts in a consistent manner.



1) After selecting your county, select a "Sector" **(1)** from the UW CIG tool's drop-down menu. Start by selecting the "Agriculture" sector.

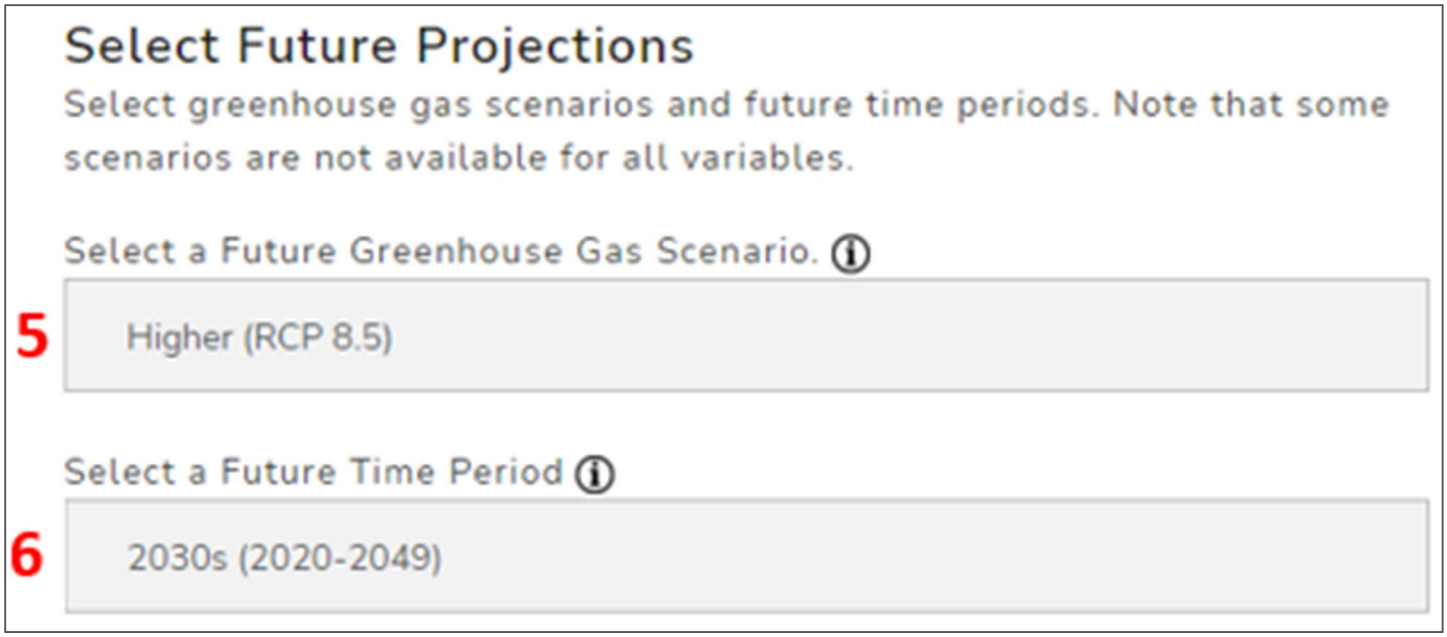
- ***NOTE:*** *You will repeat this step and the following ones for every sector on the list to assess which climate hazards and impacts are relevant to your jurisdiction. This will help you later to identify appropriate climate resilience goals and policies within each of the 11 sectors.*

2) Click through each hazard listed on the "Impact" button's drop-down list **(2)**. Start by selecting "Extreme Heat," and work your way through every hazard.

3) For each hazard that is relevant to the sector you've selected, the UW CIG tool will automatically list a relevant indicator (for example, "Summer Maximum Temperature") in the "Change in Climate" button **(3)**.

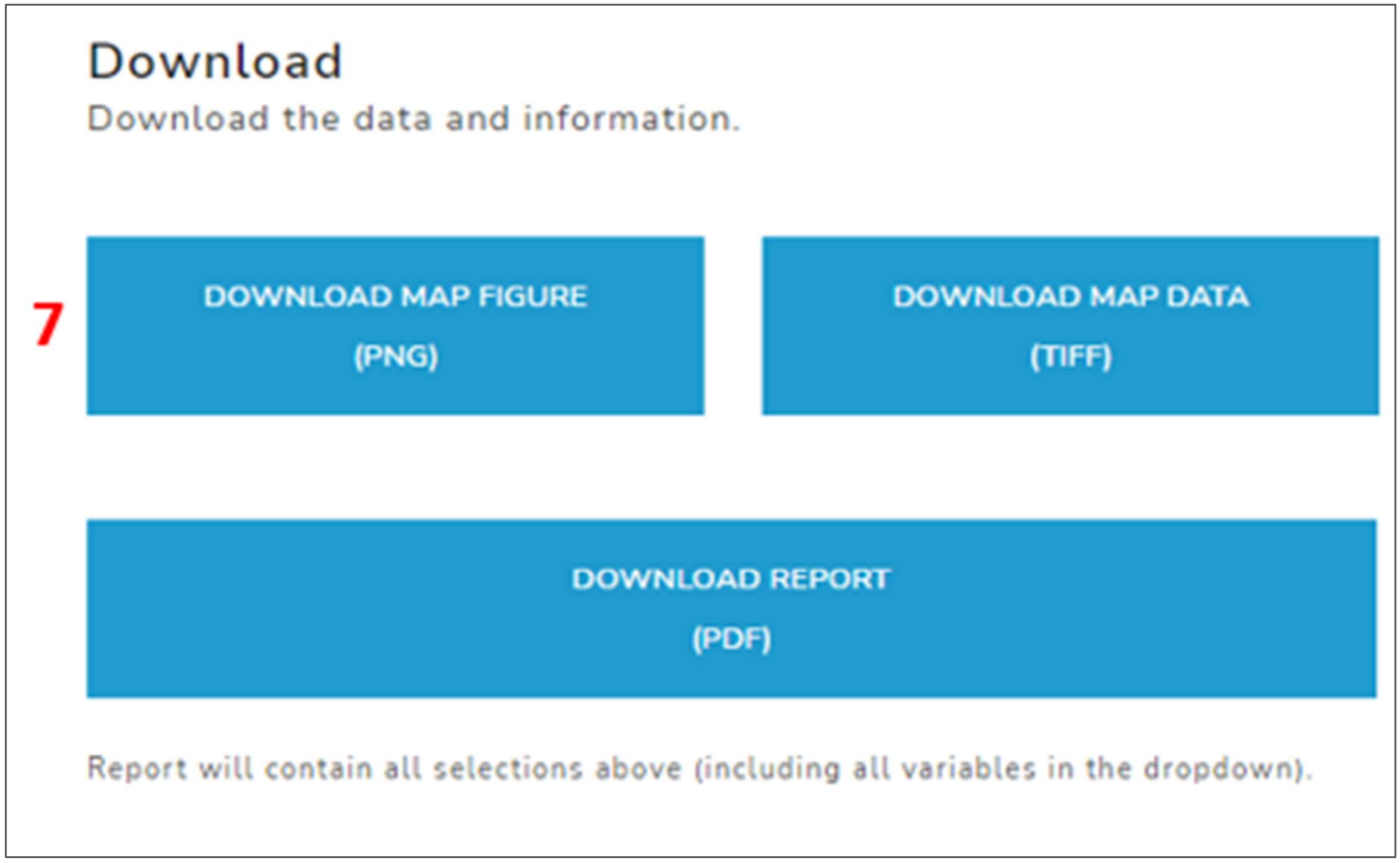
- ***NOTE:*** *Some sector-hazard pairs will list several indicators that can be shown in a map or graph. The Agriculture-Drought pairing, for example, includes the following indicators in the "Change in Climate" drop-down list: late summer precipitation; precipitation drought; dry season streamflow; summer streamflow; and, streamflow timing.*

4) Additional links **(4)** provide useful context regarding potential impacts of the change in climate and the exposure and sensitivity of assets within the sector you've selected. Click on the tool's "Definitions" link or text-embedded information icons for definitions of key terms.



5&6) For each sector-hazard pairing, explore the climate impacts by different greenhouse gas emissions scenarios **(5)** and time periods **(6)**.

- ***NOTE:*** *We recommend that you explore lower and higher greenhouse gas emissions scenarios for the early, middle, and late century (for example, in 2023, this would be the 2030s, 2050s, and 2080s). Looking at multiple emissions scenarios and time periods will help your jurisdiction understand how the range of climate impacts is projected to change through the 21st century, as well as help align your periodic climate impacts analysis with your comprehensive plan horizon (20 years) and update cycle (every 10 years).*



7) Upon completing your assessment, you may download a comprehensive report **(7)** that summarizes your county's expected climate impacts. Additional buttons enable you to download related maps and data tables.

- Use the companion **Resilience Planning Workbook** to record this information in a table.
  - Use the table's "Notes" column to identify potential information gaps that may warrant further analysis using other resources [*See below*] or via a more detailed climate vulnerability and risk assessment *[Step 4*].
  - Use the table's "Impacts" column to note how the changes in the climate and hazards may affect local built, natural, and social assets (forests, bridges, crops, etc.) within each sector. The following table [*Figure* **##**], adapted from a UW CIG guidebook[7], can help you identify and describe additional climate impacts and assets that may warrant climate resilience polices in your comprehensive plan.

[7] University of Washington Climate Impacts Group (2007), Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments

Figure ##: List of potential climate impacts, by sector, in Washington

Sector	Potential climate-related impacts
Agriculture *(includes production and distribution)*	Changes in crop yields Potential ability to "double crop" Increased risk of heat stress on crops and livestock Increased demand for irrigation due to longer and warmer growing season Changes in weeds and /or plants that grow with the crops Increased risk of pest outbreaks and weeds Increased risk of food scarcity following major hazardous events that disrupt food transportation, distribution
Buildings & Energy *(includes generation, transmission, and consumption)*	Reduced heating demand during winter months More frequent power loss due to extreme storms and other hazard events. Increased cooling demand during summer months, extreme heat events Increased or decreased hydroelectric generating capacity due to potential for higher or lower streamflow
Cultural Resource & Practices *(includes historic sites and cultural resources and practices)*	Loss of cultural and historical sites on coastline to sea-level rise and related impacts Loss of cultural and historic sites due to more frequent and intense severe weather events Loss of locally grown, temperature-sensitive foods that are culturally important (berries, shellfish, salmon, etc.)
Economic Development *(includes business continuity, opportunities)*	Increased disruptions of business continuity from wildfires and other hazards Price volatility in energy and raw product markets due to more extreme weather events Increased insurance premiums due to more extreme weather Fewer shipping disruptions associated with snow and ice Impacts on business infrastructure within floodplains or coastal areas Shifts in business opportunities Increased opportunities for warm-season activities in milder areas Decreased opportunities for warm-season activities during the hottest part of the year (e.g., from heat, forest fires, low water levels, reduced urban air quality) Reduced opportunities for cold-season recreation due to decreased snowpack and/or reduced snow or ice quality Increased reliance on snow-making at ski areas Shifts in tourism dollars within a jurisdiction from one recreation sector to another, or from jurisdiction losing recreational opportunities to jurisdiction gaining opportunities
Emergency Management *(includes preparedness, response, recovery)*	Increased costs and demands for emergency preparedness, response, and recovery activities due to more frequent and intense hazard events (e.g. overtime for snowplow drivers, salt/ice-melting tools, overtime for firefighters, sand to put in sandbags, etc.) Additional cost in human well-being as first responders are constantly on/responding with little downtime for recovery. In addition to first responders, more residents will be impacted by hazards on a year-round basis.

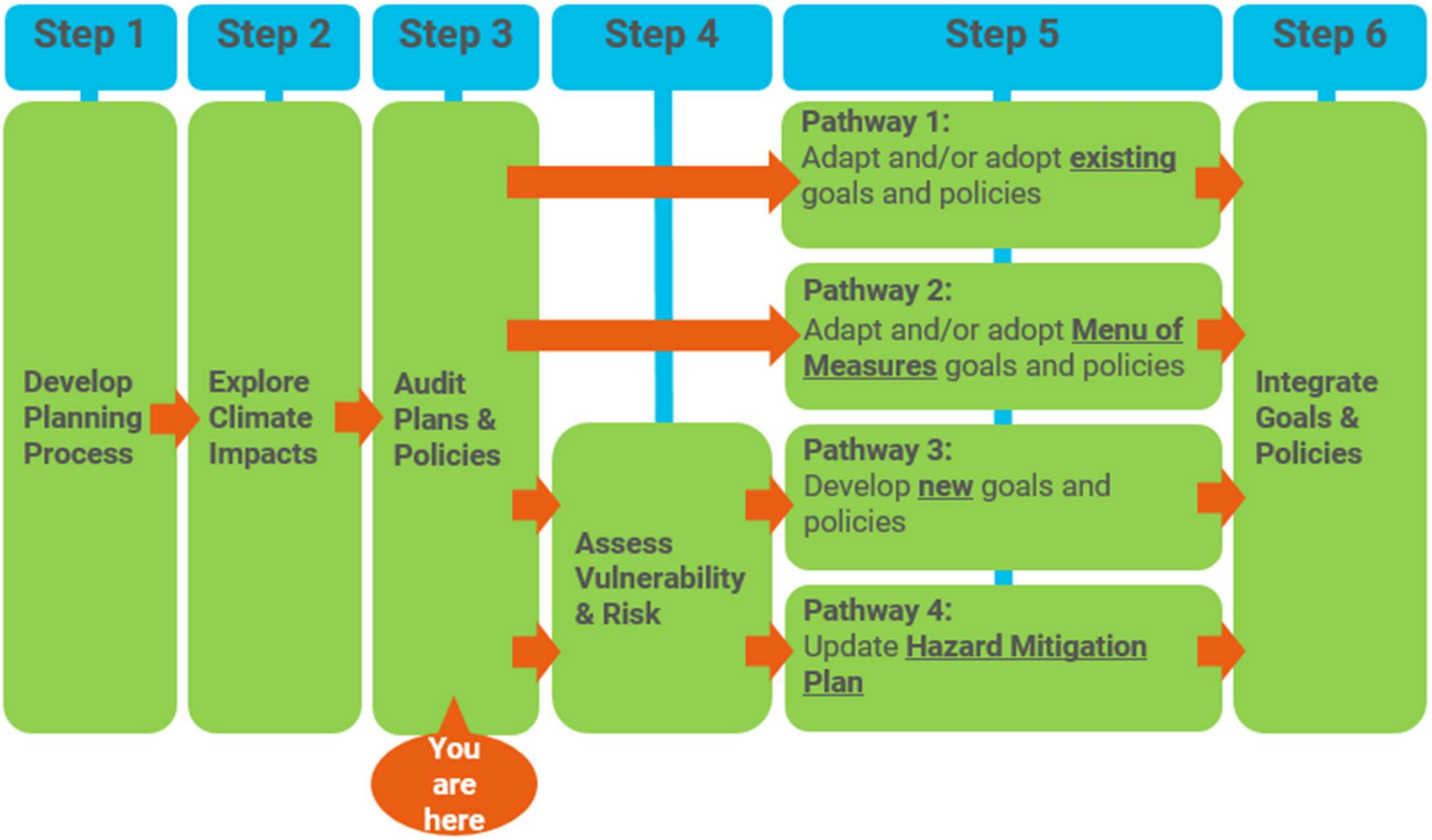
Sector	Potential climate-related impacts
Human Health *(includes community well-being and engagement)*	Rising temperatures will lead to an increase in heat-related deaths and illnesses, particularly among the elderly, poor, and other vulnerable populations. Rising temperatures and wildfires and decreasing summer precipitation will lead to increases in ozone and particulate matter, elevating the risk of cardiovascular and respiratory illnesses and death. Increasing coastal and inland flooding exposes populations to a range of negative health effects. Ticks will show earlier seasonal activity and be expanding northward, increasing risk of human exposure to Lyme disease. Increase in water temperatures will alter timing and location of vibrio growth, increasing exposure and risk of waterborne disease. Changes in exposure to weather-related disasters can cause or exacerbate stress and mental health consequences. Increased vulnerability of residents, particularly those who live in poverty and polluted and/or high-risk hazard areas.
Ecosystems *(includes terrestrial and aquatic species, habitats, and services)*	Shift in the distribution and range of plant and animal species Loss of species not able to adapt to changes Increased competition from and expanded coverage of invasive species Increase in forest growth and productivity in the near-term where soil moisture is adequate and fire risk is low (and vice versa) Increased risk of insect outbreaks Increased risk of forest fire Loss of near-shore habitat and coastal wetlands to sea-level rise and erosion, where sufficient space for habitat migration is not available Reduced presence of ephemeral wetlands Increased ocean acidification Increased sea surface temperature Increased stress on coldwater species in lakes and rivers Loss of shrubsteppe ecological function and biodiversity
Transportation *(includes multimodal travel and infrastructure)*	Increased brush fires in roadside and median strip vegetation More frequent landslides, road washouts, and flooding Fewer travel disruptions and lower maintenance and infrastructure costs associated with snow and ice More travel disruptions associated with landslides, road washouts, and flooding Potential reductions in water-based navigation due to lower summer streamflows Increased road surface damage from higher temperatures Increased maintenance requirements for roadside and median strip vegetation

Sector	Potential climate-related impacts
Waste Management *(includes materials recycling and disposal)*	Increased solid waste (downed tree limbs, building rubble, roof shingles) and associated environmental and public-safety impacts following severe storms and other hazards Increased waste associated with population growth (climate migration) and hazards presents opportunities for recycling materials into new products (cradle-to-cradle) Increased emissions of carbon dioxide, methane and other greenhouse gases associated with the transport and disposal of waste
Water Resources *(includes water quality and quantity)*	Shift in the timing of spring snowmelt Lower summer streamflow Increased risk of drought Increased risk of flooding Increased competition for water Warmer water temperature in lakes and rivers Changes in water quality Increased demands on stormwater management systems with the potential for more combined stormwater and sewer overflows Saltwater intrusion into coastal aquifers due to sea-level rise Increased risk of pollution from coastal hazardous waste sites due to sea-level rise
Zoning & Development *(includes site use, design, and other development facets)*	Increased climate-induced displacement and migration Increased erosion or damage to coastal infrastructure, dunes, beaches, and other natural features due to sea level rise and storm surge Changes in housing stock availability due to hazard events Increased stormwater runoff from impervious surfaces Increased costs for maintenance and expansion of coastal erosion control (natural or man-made) Need for new or upgraded flood-control and, erosion-control structures Reduced effectiveness of sea walls with sea-level rise

Additional Resources:

- The federal government's **U.S. Climate Resilience Toolkit** provides additional online resources, including county-scale climate data via The Climate Explorer.
- The federal government's companion **Climate Mapping for Resilience and Adaptation** (CMRA) tool provides information about past, present, and future climate conditions at the census tract and tribal reservation scales.
- Commerce's online **Climate Dashboard** also includes state- and regional-level reports, spatial planning tools, and other resources — several of which are noted as resources throughout this guidance.

Step 3 — Audit Plans & Policies



In this **third of three foundational steps**, your jurisdiction will apply information from Step 2 to assess how well existing local plans and policies build climate resilience. Your jurisdiction will begin by reviewing your existing planning documents (plans, reports, guidebooks, design standard manuals) and looking for climate resilience opportunities and gaps. Your jurisdiction will conclude this step by answering a series of questions to determine your next step toward integrating climate resilience measures into your comprehensive plan.

Task 3.1: Review local plans, goals, and policies for climate gaps and opportunities

Identify your jurisdiction's existing plans that have goals and policies (measures) that explicitly or implicitly build climate resilience. This list should, at a minimum, include your comprehensive plan. Add to the list other documents (hazard mitigation plan, climate plan, floodplain management plan, shoreline master program, community health improvement plan, etc.) that have relevant goals and policies.

> ***NOTE:*** *The Shoreline Management Act (SMA) and WAC 173-26 provide specific direction on implementation of the SMA through local Shoreline Master Programs (SMPs). SMP goals and policies may be located directly in your comprehensive plan or they may be contained fully within your SMP.*

- Use the **Resilience Planning Workbook** to list your documents and determine your desired next step for each measure (amend measure, add measure, etc.). To help identify opportunities and gaps, crosswalk each measure with the climate hazards and impacts you identified in Step 2 as relevant to your community. Also, note how each measure intersects with the Model Climate Element's 11 sectors.

The following tables about GMA and comprehensive plan elements [*Figures* ## *and* ##] can help you with this work.

Figure ##: List of the Growth Management Act's mandatory (M) and optional (O) elements of a comprehensive plan.

Comprehensive Plan Elements[8]		
Land Use (M)	Park & Recreation (M)	Conservation (O)
Housing (M)	Economic Development (M)	Solar Energy (O)
Capital Facilities (M)	Shoreline Master Program (M)[9]	Natural Resource Lands (O)
Utilities (M)		Design (O)
Rural (M) — counties only	Environmental Protection (O)	Historic Preservation (O)
Transportation (M)	Subarea Plans (O)	Natural Hazard Reduction (O)

Figure ##: Crosswalk of the Climate Model Element's sectors with the Growth Management Act's goals (numbered) and comprehensive plan elements.

Sector	Nexus with Growth Management Act Goals[10]	Nexus with Comprehensive Plan Elements
Agriculture *(includes production and distribution)*	(8) Natural resource industries: Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands, and discourage incompatible uses.	Rural; Land Use; Natural Resource Lands
Buildings & Energy *(includes generation, transmission, and consumption)*	(12) Public facilities and services: Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards. (4) Housing: Plan for and accommodate housing affordable to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage preservation of existing housing stock. (13) Historic preservation: Identify and encourage the preservation of lands, sites, and structures, which have historical or archaeological significance.	Capital Facilities; Utilities; Housing; Land Use; Ports; Solar Energy; Economic Development; Transportation; Design; Environmental Protection; Conservation

[8] GMA Mandatory elements are in WAC 365-196-400; optional elements are in WAC 365-196-445.
[9] The Shoreline Management Act (SMA) and WAC 173-26 provide specific direction on implementation of the SMA through local Shoreline Master Programs (SMPs). SMP goals and policies may be located directly in your comprehensive plan or they may be contained fully within your SMP.

[10] GMA goals 1-13 are in RCW 36.70A.020, and GMA goal 14 is in RCW 36.70A.480.

Sector	Nexus with Growth Management Act Goals[10]	Nexus with Comprehensive Plan Elements
Cultural Resources & Practices *(includes historic sites and cultural resources and practices)*	(13) Historic preservation: Identify and encourage the preservation of lands, sites, and structures, which have historical or archaeological significance.	Capital Facilities; Housing; Land Use; Rural; Historic Preservation
Economic Development *(includes business continuity, opportunities)*	(5) Economic Development: Encourage economic growth consistent with comprehensive plans, promote economic opportunity for all citizens of this state within the capacities of the state's natural resources, public services, and public facilities.	Economic Development; Land Use; Ports; Capital Facilities; Solar Energy; Conservation
Emergency Management *(includes preparedness, response, recovery)*	(11) Citizen participation and coordination: Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to reconcile conflicts. (12) Public facilities and services: Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.	Capital Facilities; Utilities; Housing; Land Use; Ports; Economic Development; Natural Hazard Reduction
Human Health *(includes community well-being and engagement)*	(10) Environment: Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water. (11) Citizen participation and coordination: Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to reconcile conflicts.	Housing; Land Use; Capital Facilities; Park & Recreation; Environmental Protection
Ecosystems *(includes terrestrial and aquatic species, habitats, and services)*	(9) Open space and recreation: Retain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities. (8) Natural resource industries: Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands, and discourage incompatible uses. (10) Environment: Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water. (14) Shorelines of the state: Shoreline Management Act (SMA) goals and policies are the Growth Management Act's 14th goal.[11] The SMA's overarching goal is "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines," and SMA policies apply to shoreline use, environmental protection, and public access.[12]	Land Use; Rural; Park & Recreation; Capital Facilities; Conservation; Housing; Natural Resource Lands; Environmental Protection

[11] RCW 36.70A.480
[12] Washington Department of Ecology SMA website.

Sector	Nexus with Growth Management Act Goals[10]	Nexus with Comprehensive Plan Elements
Transportation *(includes multimodal travel and infrastructure)*	(3) Transportation: Encourage coordinated, multimodal transportation. (10) Environment: Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.	Transportation; Land Use; Housing; Ports; Capital Facilities; Environmental Protection
Waste Management *(includes materials recycling and disposal)*	(5) Economic Development: Encourage economic growth consistent with comprehensive plans, promote economic opportunity for all citizens of this state within the capacities of the state's natural resources, public services, and public facilities. (10) Environment: Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.	Capital Facilities; Utilities; Economic Development; Conservation; Environmental Protection
Water Resources *(includes water quality and quantity)*	(10) Environment: Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water. (14) Shorelines of the state: Shoreline Management Act (SMA) goals and policies are the Growth Management Act's 14th goal. The SMA's overarching goal is "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines," and SMA policies apply to shoreline use, environmental protection, and public access.	Utilities; Land Use; Capital Facilities; Rural; Conservation; Housing; Economic Development; Park & Recreation; Environmental Protection
Zoning & Development *(includes site use, design, and other development facets)*	(2) Reduce sprawl: Reduce the inappropriate conversion of undeveloped land into sprawling, low-density development. (1) Urban growth: Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner. (6) Property rights: Private property shall not be taken for public use without just compensation having been made. The property rights of landowners shall be protected from arbitrary and discriminatory actions. (7) Permits: Applications for both state and local government permits should be processed in a timely and fair manner to ensure predictability. (11) Citizen participation and coordination: Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to reconcile conflicts. (14) Shorelines of the state: Shoreline Management Act (SMA) goals and policies are the Growth Management Act's 14th goal. The SMA's overarching goal is "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines," and SMA policies apply to shoreline use, environmental protection, and public access.	Housing; Land Use; Capital Facilities; Park & Recreation; Ports; Conservation; Rural; Recreation; Subarea Plans; Economic Development; Environmental Protection

Task 3.2: Determine next steps

Your jurisdiction has reached a key decision point where you will determine whether to proceed to Step 4 (Assess Vulnerability and Risk) or skip to Step 5 (Pursue Pathways). This decision should factor in your assessment of local climate impacts [*Task 2.1*] and completed plan and policy audit [*Task 3.1*]. Read the description of pathways below and use the **Resilience Planning Workbook** to answer a set of high-level questions that will help your jurisdiction determine the most appropriate next step.

Description of Pathways

Below is a description of each pathway and an example of why a jurisdiction may want to take the pathway by itself or in combination with another pathway. Pathways 1 and 2 will generally require less time, staff capacity, and budget. Pathways 3 and 4 — which incorporate a climate vulnerability and risk assessment — will require more time and resources but could produce more locally tailored measures (goals, policies, and implementation actions) to build climate resilience and equity. All pathways conclude with Step 6, integrating climate goals and policies into the comprehensive plan.

Pathway 1: Adapt and/or adopt goals and policies from your climate action plan and/or other existing plans.

This pathway may be preferable for a jurisdiction that has already created a climate action plan with resilience and emissions mitigation goals and policies and/or a climate chapter/element in its comprehensive plan. This pathway — which does not include conducting a supplemental vulnerability and risk assessment [*Step 4*] — could be taken by itself or in combination with another pathway. For example, if a jurisdiction's audit [*Task 3.1*] showed policy gaps in its existing plans, the jurisdiction might opt to fill them with policies from Commerce's **Menu of Measures** [*Pathway 2*].

Pathway 2: Adapt and/or adopt goals and policies from the Menu of Measures.

This pathway may be preferable for a jurisdiction that has not yet done any climate planning work and doesn't have the staff capacity and other resources to take more than a streamlined approach to selecting and integrating climate resilience goals and policies into its comprehensive plan. A jurisdiction could adapt and/or adopt individual goals and policies from the **Menu of Measures**.

> ***NOTE:*** *Taking this pathway now would still allow a jurisdiction to conduct a climate vulnerability and risk assessment, and revise goals and policies later.*

Pathway 3: Develop new resilience goals and policies — based on a vulnerability and risk assessment [*Step 4*] — to go into a climate action plan and/or directly into the comprehensive plan.

This pathway may be preferable for a jurisdiction that has the resources and desire to conduct a vulnerability and risk assessment to develop locally tailored climate resilience goals and policies for a climate action plan (new or existing plan) and/or the comprehensive plan. Conducting a climate vulnerability and risk assessment — which includes considering the exposure, sensitivity, and adaptive capacity of local built, natural, and social assets — will help a jurisdiction better evaluate climate risks and integrate local context into goals and policies.

> ***NOTE:*** *Instead of conducting a vulnerability and risk assessment that considers all climate-exacerbated hazards, a jurisdiction might opt to conduct an assessment of a single sector or hazard to develop a*

focused resilience strategy with goals, policies, and detailed action steps. Step 4's tasks are applicable for either approach.

Pathway 4: Update your hazard mitigation plan — based on a vulnerability and risk assessment [*Step 4*] — and then adopt the plan, by reference, in your comprehensive plan.

A jurisdiction may want to use Step 4 of the Resilience Guidance to assess climate vulnerability and risk in a hazard mitigation plan. This approach could provide some efficiencies and better integration of the hazard mitigation plan and the comprehensive plan. The hazard mitigation plan would be approved by the Federal Emergency Management Agency (FEMA) and could be adopted, by reference, in a comprehensive plan.

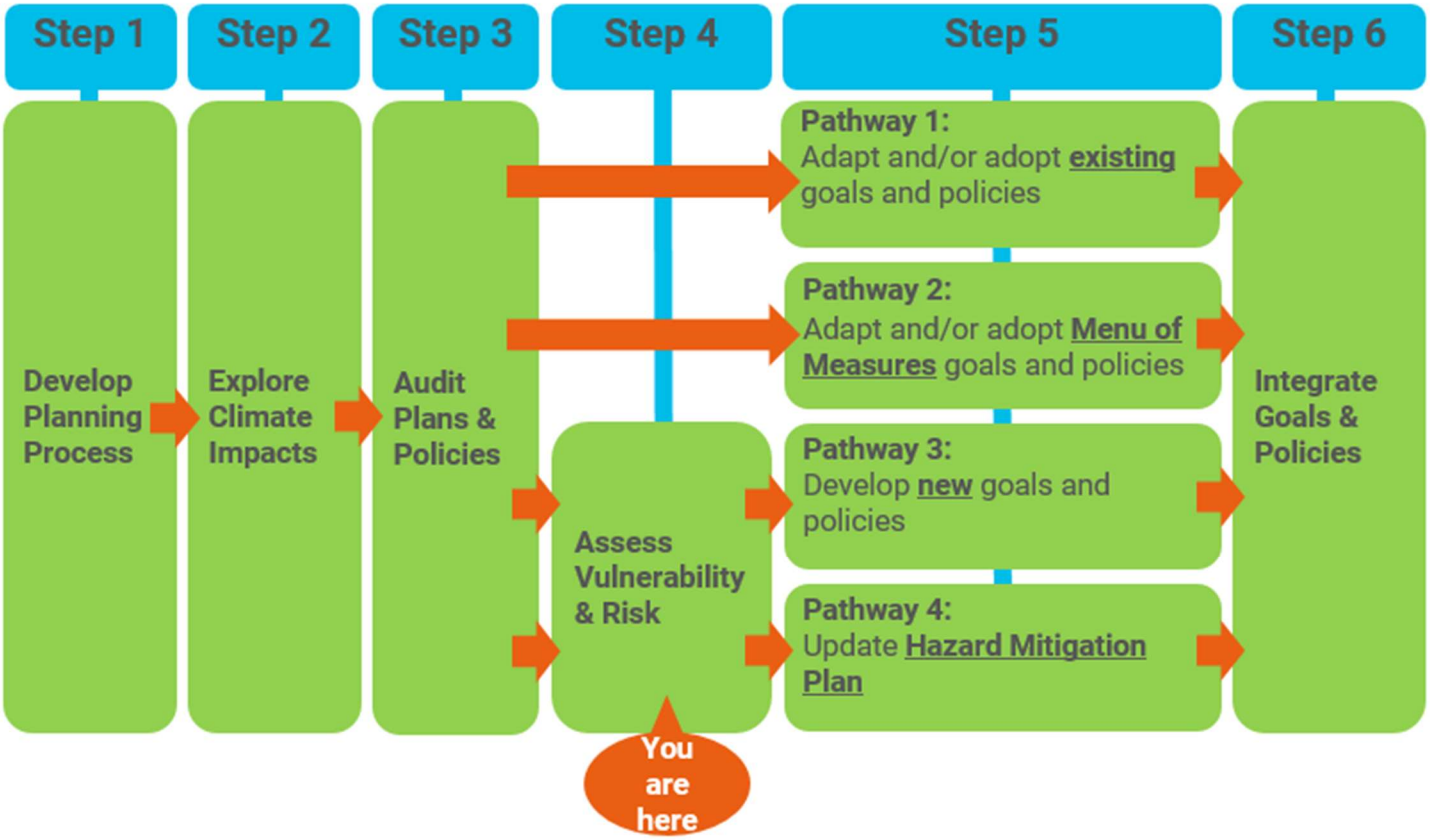
> ***NOTE:*** *As of April 2023, FEMA requires that all updated local hazard mitigation plans must assess the effects of climate change and other "future conditions" in the document's required risk assessment. See Appendix **##** for more details about FEMA's requirements and examples of Washington comprehensive plans that have adopted hazard mitigation plans, by reference.*

Task 3.3: Finalize Phase 2 budget and scope

Based on the complexity of your jurisdiction's next steps, consider revising the preliminary Phase 2 budget and scope of work your jurisdiction developed as part of Task 1.3.

- If your jurisdiction is considering conducting a climate vulnerability and risk assessment [*Step 4*], your jurisdiction may want to seek outside funding and/or hire a consultant to assist with this highly technical work. Your jurisdiction also may want to do the work collaboratively at a county or regional level (with a regional council of governments, Tribes, and other partners) to leverage resources and align goals and policies.
- Think about whether your jurisdiction needs additional meetings to engage the broader community as part of Phase 2.
- Use the **Resilience Planning Workbook** to document your approach.

Step 4 — Assess Vulnerability & Risk



In this **optional step**, your jurisdiction will use information from Step 2 and other resources below to consider the exposure, sensitivity, and adaptive capacity of local assets and assess their vulnerability to climate change-exacerbated hazards [*Figure* ##]. Your jurisdiction will then characterize risk — the probability and magnitude of consequences of a hazard impacting your jurisdiction [*Figure* ##].

Figure ##: Elements of Climate Vulnerability

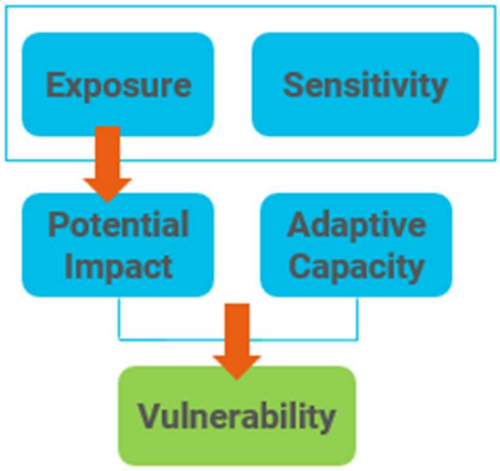
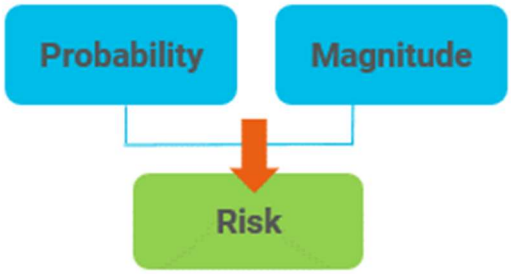


Figure ##: Elements of Climate Risk



SOURCE: Adapted from the U.S. Climate Resilience Toolkit

Before you begin

Before beginning this technical step, review the glossary's key terms [*Appendix* **##**] and watch a U.S. Climate Resilience Toolkit primer video to better understand how elements such as sensitivity and adaptive capacity will help your jurisdiction characterize how community assets are vulnerable to climate change. Also, review FEMA's Local Mitigation Planning Policy Guide if you plan to use the following tasks to help assess climate risks and impacts in your hazard mitigation plan and then adopt it, by reference in your comprehensive plan [*See Pathway 4*]. Appendix **##** includes a crosswalk of Commerce's Resilience Guidance and FEMA's requirements for updating hazard mitigation plans.[13]

Updating and Leveraging Hazard Mitigation Plans

Your jurisdiction may use Step 4 of the Resilience Guidance in a variety of ways:

- You may complete the following Step 4 tasks to help update a hazard mitigation plan to address the impacts of all climate-exacerbated hazards that affect your jurisdiction. You could then adopt the hazard mitigation plan, by reference, in your comprehensive plan.
- You may also leverage information in your existing hazard mitigation plan to assess climate vulnerability and risk for assets that are typically beyond the core focus of a hazard mitigation plan (for example, climate impacts on winter recreation and active transportation). This can help you identify supplemental policies for your comprehensive plan.
- Your jurisdiction may also use information from its hazard mitigation plan to assess climate vulnerability and risk associated with single sector or hazard — for example, sea-level rise — to develop a focused strategy with policies and detailed implementation actions.

Task 4.1: List Assets

Use the **Resilience Planning Workbook** to list social, economic, and environmental assets that your community values and wants to protect. Your project team could lead this task, seek input from community members, and draw from the Task 3.1 table.

- Your initial list should include general assets (urban tree canopy, buildings, roads, etc.). You'll have an opportunity later to refine this general list with specific assets (a key bridge or hospital), if you desire, as part of this iterative step.

Resources:

- Reference your capital facilities plan to identify assets. Hazard mitigation plans also have information about the location and type of assets and past hazard events, and the probability and extent of future hazards.
- Reference Washington State's Integrated Climate Response Strategy[14] to broaden your list of social and environmental assets.

[13] As of April 2023, all updated local hazard mitigation plans' risk assessments must address climate change and other future conditions. For more information, consult FEMA's *Local Mitigation Planning Policy Guide* (2022).
[14] Washington State Department of Ecology report (2012), Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy

Task 4.2: Pair assets and hazards

Drawing upon your knowledge of local climate impacts [*Step 2*], use the **Resilience Planning Workbook** to list each asset and every climate-influenced hazard that could affect it.

- Your list will likely include the same asset several times, and some hazards (for example, wildfire) may affect several assets.
- Create and number a row for each asset-hazard pair for later reference.

Resource:

- **University of Washington-Front and Centered's joint report —** An Unfair Share: Exploring the Disproportionate Risks from Climate Change Facing Washington State Jurisdiction[15] — can be a helpful resource for applying an equity and environmental lens in this and other Step 4 tasks. The report explores areas (floodplains, Wildland-Urban Interface, etc.) and sectors (Agriculture, Development, etc.) that are exposed to climate impacts and the social, economic, environmental factors (race, social cohesion, health status, etc.) that affect the vulnerability of communities and their assets.

Task 4.3: Describe consequences

For each asset-hazard pair on your list, describe the local consequences.

- Use your hazard mitigation plan, as well as other resources listed below, to explore the impacts of past events (for example, the duration and extent of a wildfire and the physical and economic damage it caused). Next, identify the potential consequences of the hazard exacerbated by climate change. Note these past and potential consequences in the **Resilience Planning Workbook**.
- Draw upon your Step 2 work to note any relevant change in the climate (warmer summers, wetter winters, etc.) associated with the consequences.
- Also, note non-climate stressors that could exacerbate the consequences of such changes in the climate and related hazards. Examples of non-climate stressors include things such as population growth and land conversion (for example, development actions such as converting forests into impervious surfaces can increase stormwater runoff and flooding).

Defining Consequences

Consequences — which are distinct from impacts — are the subsequent results (usually negative) that follow from damage to or loss of an asset due to a hazard.

SOURCE: Adapted from U.S. Climate Resilience Toolkit

Resources:

- The **WA Department of Natural Resources'** Geologic Information Portal includes an interactive map of past landslides and other hazards across the state.
- **FEMA's** National Risk Index provides a comparative risk score for all counties and estimates expected annual loss — in U.S. dollars — due to hazards.
- The **U.S. Climate Resilience Toolkit** also has a variety of spatial analysis resources, including sea-level rise projections, to assess potential consequences.
- Your hazard mitigation plan will also have resources listed.

[15] University of Washington Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and Centered, and Urban@UW report (2018), An Unfair Share: Exploring the disproportionate risks from climate change facing Washington state communities.

Task 4.4: Assess the sensitivity

Assess the sensitivity of each asset you paired with a hazard. Think about sensitivity in terms of an asset's inherent capacity to withstand a shock — for example, a severe storm or a seasonal change in temperature — and assess sensitivity in qualitative terms (*low, medium, or high*) in the Resilience Planning Workbook.

> ***NOTE:*** *This is a good time to consider revising your asset-hazard pairs, based on your sensitivity assessment. For example, you may want to include specific assets among your list of general assets (for example, a coastal water-treatment plant is a specific asset within the broader water system), if such assets are particularly sensitive, vital to your jurisdiction's resilience, and may warrant a unique policy or implementation action(s).*

Defining Sensitivity

Sensitivity is the degree to which a system, population, or resource is or might be affected by hazards. For example, the yield of crops with a *high sensitivity* may be reduced due to a change in daily minimum temperature during the pollination season.

SOURCE: U.S. Climate Resilience Toolkit

The value of a simple, qualitative rating

Using a qualitative rating is useful for several reasons when assessing climate vulnerability and risk:

> Future changes in the climate system cannot be projected with the exactness that is needed to precisely quantify the probability of a risk at any given future time.
>
> You might need to manage many distinct risks, and it would be prohibitively expensive to scientifically quantify the likelihood of each one.
>
> The general public has a limited ability to understand and process statistical probability.
>
> With participants in the process and the public it likely will be easier to reach agreement on a qualitative rating (e.g., *low, medium, high*) than on whether mathematical calculations of likelihood or consequence were done correctly.

The key is not to overcomplicate the process. Define what you mean by your scale and communicate these definitions to your stakeholders and regulators.

SOURCE: Adapted from U.S. Environmental Protection Agency's *Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation Plans*

Resources:

- **Washington Department of Health's** Environmental Health Disparities Map evaluates environmental health risk factors in communities. It estimates a cumulative environmental health impact score for each census tract reflecting pollutant exposures and factors that affect people's vulnerability to environmental pollution.
- **FEMA's** Resilience Analysis And Planning Tool (RAPT) enables users to examine the interplay of infrastructure locations and hazards, including historic disasters and estimated frequency of hazard risk.

Task 4.5: Assess adaptive capacity

Adaptive capacity is the ability of an asset (individual assets as well as populations and systems) to avoid damage or adapt to its paired hazard. Is your infrastructure built with the flexibility to be upgraded easily as conditions change? If so, it has adaptive capacity.

- As your jurisdiction did with sensitivity, consider the assets' attributes to assess adaptive capacity qualitatively (*low, medium, high*) and record this rating in the **Resilience Planning Workbook**.

Resources:

- The **National Wildlife Federation's** Scanning the Conservation Horizon guide for conducting climate vulnerability assessments provides useful context and concepts for assessing exposure, sensitivity, and adaptive capacity of natural systems and species.
- **Headwaters Economics'** Rural Capacity Map assesses rural jurisdictions with low capacity and high risk of climate-related hazards, specifically wildfires and floods. The interactive map assesses a jurisdiction's adaptive capacity through 10 indicators, including poverty level, educational attainment, health insurance, and planning staff capacity.

Task 4.6: Characterize vulnerability

Now that your jurisdiction has assessed sensitivity, adaptive capacity, and other concepts, use the **Resilience Planning Workbook** to characterize the vulnerability of each asset-hazard pair with a composite, qualitative rating (*low, medium, or high*). For example, your jurisdiction might deem that assets with high sensitivity and low adaptive capacity have high vulnerability.

Defining Vulnerability

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

SOURCE: Adapted from U.S. Climate Resilience Toolkit

Task 4.7: Characterize risk

It is now time for your jurisdiction to narrow its focus and characterize risk for each asset-hazard pair with medium or high vulnerability. The U.S. Climate Resilience Toolkit explains that risk is a compound concept — encompassing probability and magnitude of consequences — to describe the chance of sustaining a substantial loss [*Figure* **##**].

- Use the **Resilience Planning Workbook** to characterize risk qualitatively (*low, medium, high*), just as your jurisdiction did with vulnerability.

Defining Risk

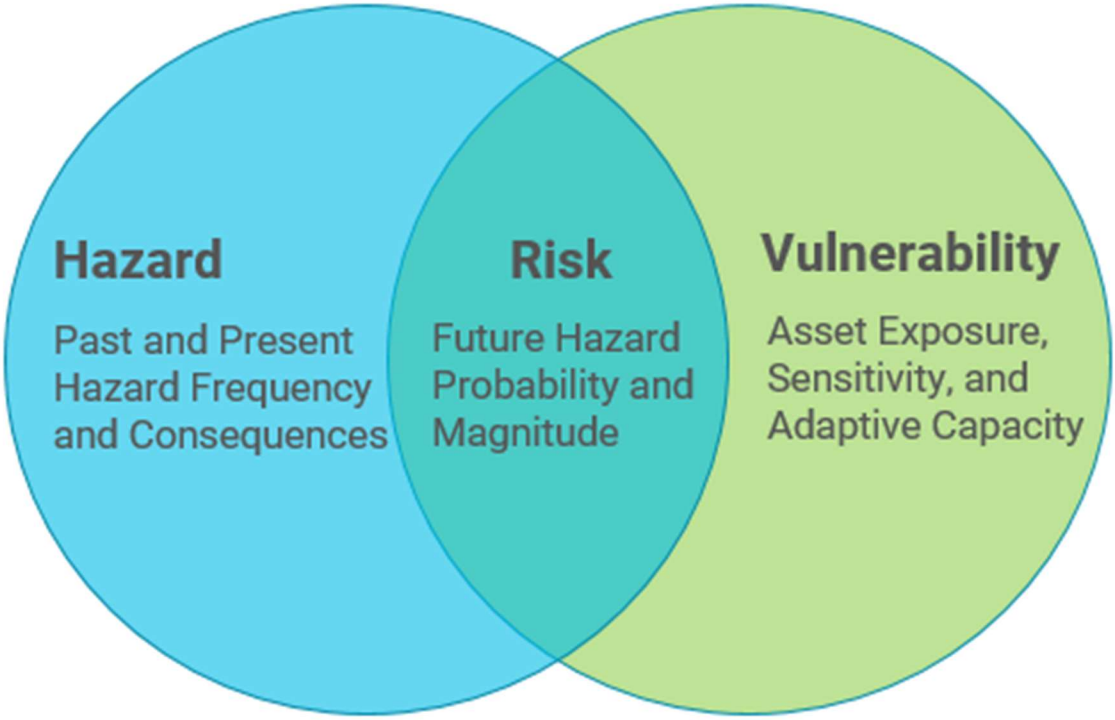
The first element of risk is the **probability** of a hazard occurring. How likely is it that the hazard will happen in your location? How frequently has it occurred in the past, and is that frequency increasing due to climate change?

The second element is the **magnitude** of consequences from the event. Would the hazard cause a major disruption for a large number of people for an extended period? Would it require a lot of money and time to regain the previous level of function?

Higher risk reflects either a higher chance of a hazard occurring or a higher cost (financial or otherwise) if the hazard occurs.

SOURCE: U.S. Climate Resilience Toolkit

Figure ##: Relationship between hazard, vulnerability, and risk



SOURCE: Washington Department of Commerce

- **Probability:** To characterize probability, consider how often a hazard occurred in the past and how likely it is to occur in the future. To consider future likelihood, draw upon the climate projections you assessed in Task 2.1. To consider past impacts, draw upon your work in Task 4.3 examining data and maps of historical floods, wildfires, landslides, avalanches, and other hazards throughout the state.

  Resources:

  - Reference your local hazard mitigation plan for helping characterize probability based on past events and future conditions.
  - The **U.S. Climate Resilience Toolkit** includes a database of spatial analysis tools — searchable by topic (e.g., energy and water) and function (e.g., past conditions and applied forecasts).

The importance of characterizing probability consistently

The U.S. Climate Resilience Toolkit recommends that communities agree upon a simple framework to characterize probability consistently. The following example incorporates three timeframes:

Characterize hazardous events that are likely to occur within 5 years as *high* probability.

Characterize events that are likely to occur just once in 5 to 20 years as *medium* probability.

Characterize events that are likely to occur less frequently than once in 20 years as *low* probability.

SOURCE: Adapted from U.S. Climate Resilience Toolkit

- **Magnitude:** To characterize magnitude of consequences, your jurisdiction may also want to draw upon its work in Task 4.3. The U.S. Environmental Protection Agency recommends thinking about hazardous events comparatively. For example, your jurisdiction might deem a high-consequence hazardous event as a costly, major disruption and a low-consequence event as comparatively small and less important.[16]

  Resource:

  - **FEMA**'s National Risk Index provides a useful tool for comparing expected annual loss (in dollars) with social vulnerability and other indicators for drought and 17 other natural hazards.

- After characterizing risk for every one of your remaining asset-hazard pairs, plot them on the 3x3 matrix in your **Resilience Planning Workbook**.

Task 4.8: Decide which risks must be addressed and next steps.

This is another appropriate time to review this document's Appendix **##** and FEMA's Local Mitigation Planning Policy Guide if your jurisdiction plans to include climate change in its updated hazard mitigation plan and to adopt it, by reference, in your comprehensive plan [*Pathway 4*]. Based on your risk characterization matrix, decide which risks are more or less acceptable, and categorize them as ones with risk to address now (take action) or as ones that you will address later and monitor in the meantime (accept risk).

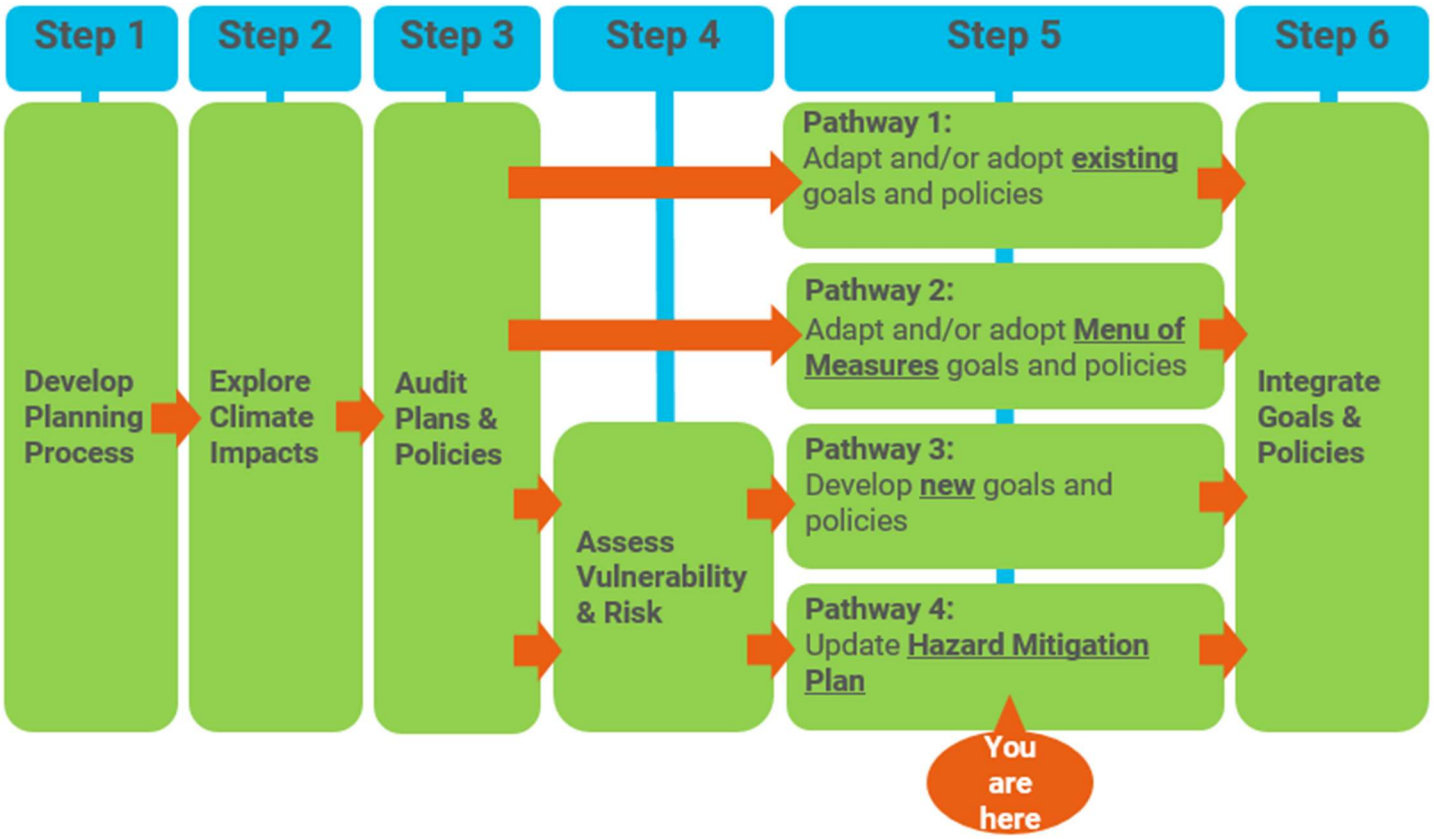
- Use the **Resilience Planning Workbook** to record your path forward.

  Decision Point: Limit your decision to either Take Action or Accept Risk.

  - **Take action** means choosing to address the risk's impacts now with policies (and, if desired, detailed implementation actions for a hazard-specific strategy). For example, your jurisdiction might choose to take action for all high (red) risks and many medium (yellow) risks of high magnitude or probability.
  - **Accept risk** means choosing to not address the risk with a policy, strategy, or action now, but to instead monitor and reassess the risk periodically (for example, as part of your periodic comprehensive plan update process). Your jurisdiction might decide this is the right path forward for green and yellow risks of lesser probability and/or magnitude.

[16] U.S. Environmental Protection Agency workbook (2014), Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation Plans

Step 5 — Pursue Pathways



In this **penultimate step**, your jurisdiction will pursue an individual pathway or a combination of pathways to choose goals and policies that build climate resilience. Use the guidance below and the **Resilience Planning Workbook** to complete your work.

Thoughts on Pursuing Pathways

As a reminder, your jurisdiction may pursue one or a combination of pathways. For example, your jurisdiction may choose to select existing resilience goals and policies from a climate action plan [*Pathway 1*] and supplement them with ones from the **Menu of Measures** [*Pathway 2*] to address opportunities and gaps identified in Step 3. Alternatively, your jurisdiction may choose to approach different hazards using different pathways and/or determine that a combination of pathways are needed to adequately address a single hazard.

All pathways reach the same destination: Your jurisdiction should adopt at least one climate resilience goal and supportive policy within all of the Model Climate Element's sectors (Transportation, Water Resources, etc.) for your comprehensive plan's climate element to be complete. The number and nature of your jurisdiction's specific climate resilience policies will be based on your assessment of local climate impacts and needs.

Your policies should recognize and promote as many co-benefits as possible (supporting tribal treaty rights, salmon recovery, etc.). Your policies should also be prioritized in "frontline" communities that will suffer disproportionately from compounding environmental impacts and will be most impacted by natural hazards due to climate change.

- See this guidance's Task 5.3 to evaluate your policies' co-benefits.
- See the broader Model Climate Element's Section ## to prioritize your policies for integration into the comprehensive plan.
- Use the **Resilience Planning Workbook** to list your climate resilience goals and policies.

Pathway 1 — Adapt and/or adopt goals and policies from existing plans

Pursuing this pathway means addressing your jurisdiction's climate hazards and impacts with resilience goals and policies from your existing body of planning work.

- Based on the planning document audit you completed as part of Task 3.1, list in the **Resilience Planning Workbook** the existing local goals and policies you're adopting into your comprehensive plan. Note any edits you've made to adapt original goals or policies to better support climate resilience.
- Follow Tasks 5.1 and 5.2 below only if your jurisdiction opts to develop new goals and policies to supplement your existing ones.
- Follow Task 5.3 to identify your policies' co-benefits.

Pathway 2 — Adapt and/or adopt goals and policies from Menu of Measures

Pursuing this pathway means addressing your jurisdiction's climate hazards and impacts with resilience goals and policies from Commerce's **Menu of Measures**.

- List in the **Resilience Planning Workbook** the Menu's goals and policies you are adopting directly into your comprehensive plan or adapting to better support your local needs and context.
- Review the document audit you completed as part of Task 3.1 to help select appropriate resilience goals and policies from the Menu. This will ensure that the resilience measures you select supplement your existing ones and adequately address local climate hazards and impacts across all 11 of the Model Climate Element's sectors.
- Follow Tasks 5.1 and 5.2 only if your jurisdiction opts to develop new goals and policies to supplement ones you've selected from the **Menu of Measures** (and other sources, if applicable).
- Follow Task 5.3 to identify your policies' co-benefits.

Pathway 3 – Develop new goals and policies

Pursuing this pathway means using information from a vulnerability and risk assessment to develop new goals and policies to address climate impacts and build resilience.

- Follow Tasks 5.1-5.3 below to create new goals and policies and then list them in the **Resilience Planning Workbook**.
- Remember, you may supplement your list of new goals and policies with ones from existing local plans [*Pathway 1*], the **Menu of Measures** [*Pathway 2*], or other sources, if desired. Such resilience goals and policies could go into a new climate action plan and/or directly into your comprehensive plan.

Pathway 4 – Update your hazard mitigation plan

Pursing this pathway means using a climate vulnerability and risk assessment to update your hazard mitigation plan and adopting it, by reference, in your comprehensive plan. As noted previously, as of April 2023, FEMA requires that all updated local hazard mitigation plans must assess the effects of climate change and other "future conditions" in the document's required risk assessment.

- Follow Tasks 5.1-5.3 to help craft new climate resilience goals and policies for your hazard mitigation plan, and ensure that the goals and policies meet FEMA Local Mitigation Planning Policy Guide requirements.
- In the **Resilience Planning Workbook**, list your updated hazard mitigation plan's climate resilience goals and policies that fit within the Model Climate Element's sectors. If needed, supplement the hazard mitigation plan's measures with ones from other sources (**Menu of Measures**, etc.).

Task 5.1: Develop goals

If you created guiding principles [*Task 1.4*], revisit them to develop climate resilience goals that complement those you may have identified in the document audit [*Task 3.1*].

- Ensure that you have at least one climate resilience goal within each of the 11 sectors below and list them in the **Resilience Planning Workbook**:

  - **Agriculture** (includes production and distribution);
  - **Buildings & Energy** (includes generation, transmission, and consumption);
  - **Cultural Resources & Practices** (includes historic sites and cultural resources and practices);
  - **Economic Development** (includes business continuity, opportunities);
  - **Emergency Management** (includes preparedness, response, and recovery);
  - **Human Health** (includes community well-being and engagement);
  - **Ecosystems** (includes land and water species and habitat);
  - **Transportation** (includes multimodal travel and infrastructure);
  - **Waste Management** (includes materials recycling and disposal);
  - **Water Resources** (includes water quality and quantity);
  - **Zoning & Development** (includes site use, design, and other development facets).

Task 5.2: Develop policies

For each goal, develop at least one supportive policy and list them in the **Resilience Planning Workbook**. Ensure your collective list of policies addresses the climate resilience opportunities and gaps identified in Step 3 and the risks identified in Step 4 (if applicable).

- Start by revising your existing policies to better support climate resilience. Be sure to also include on your list existing policies that build climate resilience — yet do not need revisions — and belong in your comprehensive plan.
- Supplement your initial list of policies with ones suggested by your stakeholders, who may already have ideas in mind based on their knowledge of past hazardous events and their communities' unique needs and assets.
- Supplement your list with policies from the **Menu of Measures** and other jurisdictions' climate plans, if desired.
- Where appropriate, identify next action steps, such as revising development codes and design standards to implement policies.

Resilience as Capacity

Whether your jurisdiction is revising existing policies, crafting new policies, or selecting ones from the **Menu of Measures**, it's helpful to think about resilience in terms of improving your jurisdiction's *capacity* to reduce, withstand, respond to, and recover from climate impacts. Look for policy solutions that provide multiple co-benefits and help achieve multiple goals. For example, adopting a policy of planting drought-tolerant street trees to adjust to hotter, drier summers has emissions mitigation (reduce) and adaptation (respond) co-benefits: Such trees store carbon, use less water, and provide shade and habitat (withstand).

Resources:

- The **Climate Dashboard** has a list of helpful resources for this task, including: MRSC's interactive map of Washington local and tribal governments' climate plans; the federal government's green infrastructure toolkit and Climate Mapping for Resilience and Adaptation portal (modeling, design, maintenance, funding resources); Georgetown University's Adaptation Clearinghouse; and, the Sustainable Development Code (municipal ordinances to implement higher-level climate policies).

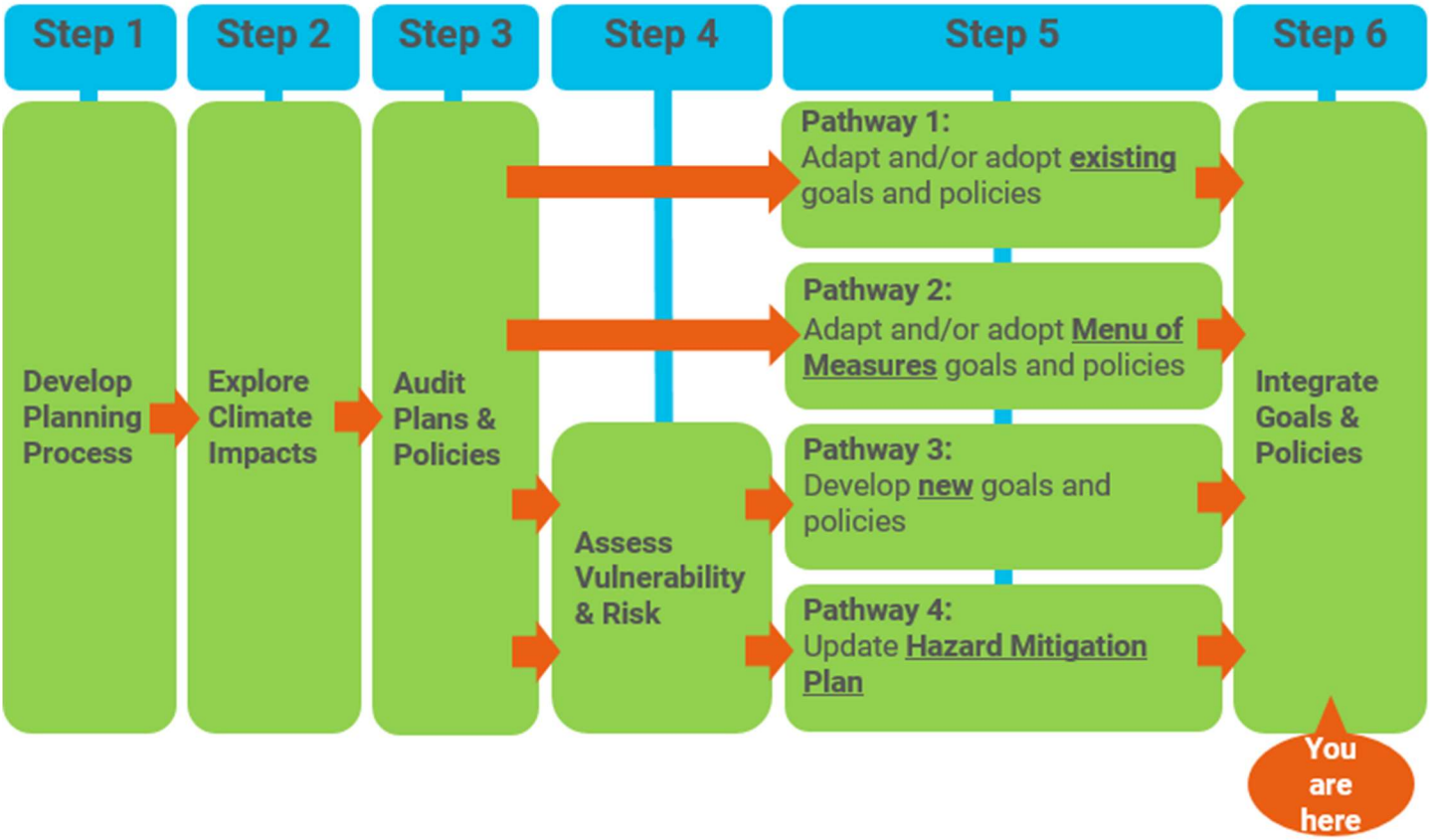
Task 5.3: Identify policy co-benefits

Commerce and its partners identified co-benefits associated with every policy on its **Menu of Measures**. The 12 co-benefits are:

- Reduces emissions
- Sequesters carbon
- Enhances resilience
- Improves salmon recovery
- Promotes economic development
- Promotes equity and justice
- Provides cost savings
- Provides ecosystem services
- Protects tribal treaty rights
- Improves public health and well-being
- Improves air quality
- Builds community knowledge

- In the **Resilience Planning Workbook**, note every co-benefit associated with each of your policies — including ones you've developed or selected from the **Menu of Measures** or other sources. The Workbook lists 12 co-benefit options from which to select.

Step 6 — Integrate Policies



In this **final step**, your jurisdiction will decide where it intends to integrate its climate resilience goals and policies in its comprehensive plan. As a reminder, your jurisdiction may choose to list all of its climate element goals and policies (mitigation and resilience) in one climate chapter or may choose to integrate them into several chapters/elements (Land Use, Housing, Transportation, etc.).

6.1: List resilience goals and policies

Enter your climate resilience goals and policies into the **Resilience Planning Workbook** [*Step 6 tab*].

- The Workbook is organized by the Climate Model Element's 11 sectors to help you ensure that your list of goals and policies is complete.
- The Workbook also enables you to note where you will place each measure in your comprehensive plan.
- Use this list to complete the checklist table [*See Section* ##] your jurisdiction submits to Commerce.

Appendix

1) Best Practices for Integrating Climate into Hazard Mitigation Plan

Hazard mitigation planning is the foundation of jurisdiction resilience, FEMA explains, because it encourages the development of a long-term mitigation strategy.[17] The planning process spurs jurisdictions to identify risks that hazards pose for assets and to develop policies before a disaster occurs. This potentially lessens the impacts to people and property and makes it easier to recover from hazard events.

Local governments must prepare a hazard mitigation plan and update it every five years to be eligible for certain types of non-emergency disaster assistance, including grants to mitigate floods.[18] Such plans must undergo review by the Washington Military Department's Emergency Management Division and the Federal Emergency Management Agency (FEMA). FEMA will grant approval of a hazard mitigation plan if it meets minimum federal requirements. Once approved, the hazard mitigation plan provides eligibility for certain FEMA grants. The State of Washington also has a hazard mitigation plan, and that document may be a resource for local jurisdictions.

> "Acknowledging the risk of future incidents builds a risk-conscious culture that enables jurisdiction leaders to routinely and systematically evaluate a wide variety of threats and hazards. However, future conditions are not necessarily reflective of past conditions, requiring a consideration of science-based data and expertise to help inform decisions. Jurisdiction leaders can then prioritize strategies, resources, and efforts using a well-informed comprehensive approach to preparedness."
>
> **FEMA National Mitigation Strategy**

FEMA Planning Framework for Hazard Mitigation Plans

While there is no required format for a hazard mitigation plan, federal regulations require that it include: [19]

- Documentation of the planning process, which must include an opportunity for the public to comment on the plan during the drafting stage and prior to final approval;
- A risk assessment that provides the factual basis for activities proposed to reduce losses from hazards that can affect the jurisdiction. The assessment must describe the type, location, and extent of all natural hazards that can affect the jurisdiction, as well as include information regarding previous occurrences of hazard events and the probability of future hazard events;
- A mitigation strategy that provides the jurisdiction's blueprint — action plan — for reducing potential losses identified in the risk assessment;
- A plan maintenance process that includes: the method and schedule for updating the plan within a five-year cycle; a discussion of how the jurisdiction will be engaged in the plan's maintenance; a process by which local governments incorporate the plan's requirements into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate; and documentation that the mitigation plan has been formally adopted.

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[17] FEMA circular (2017), Planning For a Resilient Jurisdiction: A 4-Hour Workshop For Planners
[18] FEMA website (2022), Hazard Mitigation Plan Regulations & Guidance
[19] Title 44 Code of Federal Regulations (CFR) §201.6

FEMA Requirements for Assessing Climate in Hazard Mitigation Plans

Climate change affects the characteristics of hazards and severity of impacts. For example, rising sea levels associated with warmer temperatures and melting polar ice raise the risk of coastal flooding in Puget Sound jurisdiction and increase the vulnerability of low-lying roads and buildings (i.e., assets) to impacts.

As of April 2023, FEMA requires that all updated local hazard mitigation plans' risk assessments must address climate change and other future conditions. Section 4 of the FEMA's Local Mitigation Planning Policy Guide (Policy Guide) specifies FEMA's requirements (elements) for climate assessment, equity inclusion, policy prioritization (needs to consider costs, etc.), and plan implementation (which can include integrating policies into a comprehensive plan).

To help Washington cities and counties with this work, FEMA conducted the following crosswalk of its Policy Guide with Commerce's Resilience Guidance.

2) FEMA Guidance Crosswalk

(See Excel file)

3) Resilience Planning Workbook

(See Excel file)

4) Glossary

(See Excel file)