Port Angeles Climate Resilience Discussion Guide

February 8, 2023

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Purpose and Objectives

Responding to state legislation,[1] the Washington Department of Commerce (Commerce) is developing guidance for counties and cities to voluntarily address climate change issues within their comprehensive plans. When complete, the Model Element will address both resilience (preparation for adverse effects from climate change) as well as mitigation (greenhouse gas reduction).

Through an interagency effort[2] Commerce developed a Model Climate Element with resilience planning guidance (Resilience Guidance) to illustrate how counties and cities can develop and implement plans, goals, and policies that build communitywide climate resilience. In addition, the University of Washington Climate Impacts Group has developed a county-level climate planning tool (Planning Tool) to identify expected changes in the climate and related natural hazards.[3]

To test and improve Resilience Guidance, Commerce developed a pilot program. Port Angeles is one of three pilot jurisdictions (along with Woodland and Pullman). Cascadia Consulting Group and BERK Consulting were selected by Commerce to apply the Resilience Guidance and Planning Tool and develop potential goal and policy changes in collaboration with the pilot jurisdiction.

Use of the Resilience Guidance

The Resilience Guidance and Planning Tool 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. For example, the Resilience Guidance can help a jurisdiction identify, design, and invest in traditional and "green" infrastructure — for example, curbside bioswales — as well as conserve and protect natural areas that provide flood storage or habitat for fish and wildlife.

New or modified Comprehensive Plan goals and policies can also help prioritize health and safety and the needs of residents that may have less ability to adapt to hazards exacerbated by climate change (e.g. those with pre-existing health conditions, lower incomes, etc.) as well as address continuity of businesses, emergency services, and other needs.

[1] The model element is described in the 2021 budget [Section 129 (126)] and must be completed by June 2023.

[2] Washington State Department of Commerce, Washington State Department of Transportation, Department of Ecology, Department of Health, Department of Fish & Wildlife, Department of Natural Resources, and Military — Emergency Management Division. The core team also includes members from the U.W. Climate Impacts Group, Municipal Research & Services Center, and Association of Washington Cities.

[3] See UW CIG Tool, Climate Mapping For A Resilient Washington, available: https://cig-wa-climate.nkn.uidaho.edu/.

The purpose of this Discussion Guide is to:

- Share the early results of the Resilience Guidance and Planning Tool application in Port Angeles
- Identify the potential hazards that may be exacerbated by climate change.
- Present goals, policies, and strategies that build on the City's recent Climate Resiliency Plan and could be reinforced or added in the Port Angeles Comprehensive Plan

In addition, the pilot effort provides a preliminary assessment of sea level rise vulnerability and risk in the downtown area.

Resilience Guidance Process

The Resilience Guidance covers 11 sectors that are important to counties and cities, including:

- **Agriculture** (includes production and distribution). For a city this could focus on industrial areas that process and distribute agricultural products, as well as food systems that ensure local communities are more self-sufficient and have access to local food.
- **Buildings & Energy** (includes generation, transmission, and consumption)
- **Cultural Resources & Practices** (includes historic sites and cultural resources and practices that may be at risk of damage due to hazards exacerbated by climate change such as flooding)
- **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 Resilience Guidance is a tool to evaluate existing plans considering how they address each sector and the potential local climate impacts and identify new or amended goals and policies to bolster existing plans and local government partnerships. The audit focused on these plans:

- North Olympic Peninsula Resource Conservations & Development Council (NODC): Natural Disaster Resiliency Planning
- City of Port Angeles Capital Facilities & Transportation Improvement Plan 2023-2028
- City of Port Angeles Climate Resiliency Plan 2022
- City of Port Angeles Comprehensive Plan 2019
- City of Port Angeles Shoreline Master Program 2021

To develop recommendations, the project team met bi-weekly with Community Development staff and:

- **Analyzed local climate impacts** using the Planning Tool.
- **Performed an audit of existing plans** and policies to identify relevant goals, policies and strategies that support communitywide resilience across the sectors. (See list of plans above.)
- **Linked climate impacts to relevant existing relevant policies.** The plans reviewed address some hazards and sectors.
- **Utilized a menu of measures**, drafted by Commerce and its partners, to fill in any gaps. The menu of measures included example goals and policies by sector that could be effective for local governments depending on their local circumstances.
- **Drafted preliminary climate resilience goals and policies (amendments or additions to goals and policies).** The preliminary recommendations consider the co-benefits of activities that would result in one or more of the following: enhances resilience; improves public health and well-being; promotes economic development; provides cost savings; provides ecosystem services; improves air quality; reduces emissions; sequesters carbon; improves salmon recovery; promotes equity and justice; protects tribal treaty rights; and builds knowledge.

Definitions

As the City considers preliminary goal and policy amendments, it could add or refer to common definitions. The Resilience Guidance and Planning Tool use terms and definitions from published sources such as the US Climate Resilience Toolkit: https://toolkit.climate.gov/content/glossary. The definition of resilience includes: *The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.*

Local Climate Hazards

Port Angeles has experienced and will continue to experience climate hazards, like other communities in Washington State, such as:

- **Increased Heat:** Warmer summers with longer and more intense heat waves.
- **Heavy Rains, Flooding, and Landslides:** More frequent and intense precipitation and storms that cause extreme flooding and increase landslide risk. Changes in timing and hydrologic conditions in rivers.
- **Summer Drought, Reduced Snowpack, and Wildfire:** Less rain in the summer and warmer winters with reduced snowpack may create drought conditions. Additional summer dry conditions may create more wildfire risk and smoke.
- **Rising Sea Level:** Sea level rise increasing coastal flooding, erosion, and decreasing water quality.

These local climate hazards have implications for how the City plans ahead to adapt existing areas to be more resilient (e.g., new buildings and street locations and designs, new or retrofitted tree and landscaping standards for drought resistance and shade), or how the City responds during or after hazards (public service and business continuity, evacuation, recovery).

The Planning Tool developed by UW Climate Impacts Group (https://cig-wa-climate.nkn.uidaho.edu/) illustrates climate indicators by sector, and hazards. While much information is at a county level, some information is more local (e.g., potential changes in stream temperature).

Preliminary Draft Goals and Policies

By the 11 sectors addressed in the Resilience Guidance, following are potential draft goals or policies (new or amended) for review. They will be shared with the Planning Commission on February 8, 2023 as part of an interactive discussion. The following questions will be addressed:

- Do any of the policies stand out as very important?
- Are there any policies missing?
- What needs to be revised?

A number of the policy proposals to be integrated into the Comprehensive Plan are based on other relevant plans adopted by the City and are noted.

Transportation

The City maintains a network of roads and non-motorized pedestrian and bicycle facilities. It is dependent on US 101 to connect to surrounding communities and counties.

Climate-related hazards (e.g. flooding or landslides, fires, or heat) could affect transportation systems including travel disruptions, road and bridge damage, and increased maintenance of road surfaces and roadside vegetation. Improving the resilience of the transportation network could mean design and location of facilities considering hazards, as well as offering new connections in multiple modes (e.g., pedestrian and bicycle routes and transit). Encouraging multiple modes can offer flexibility in terms of access and evacuation, offer active living opportunities, and reduce greenhouse gas emissions (mitigation). Draft goals and policies suggest additional emphasis on non-motorized and transit systems connectivity and service as well as design and location of all transportation modes to be more resilient.

Table 1. Transportation (includes multimodal travel and infrastructure)

Goal	Policy	Comp Plan Element	Co-Benefits
G-10E To provide a system of walking trails and bicycle paths to complement and coordinate with the existing street system and provide recreational opportunities and physical activity while reducing the dependence on traditional automobile transportation.	Maximize bicycle and pedestrian infrastructure and other active-transportation systems.	Transportation	▪ Reduces emissions ▪ Enhances resilience ▪ Improves health and wellbeing ▪ Improves air quality
G-4A To develop a coordinated, multimodal transportation system, which serves all areas of the city and all types of users in a safe, accessible, economical, and efficient manner.	Support Clallam Transit in expanding public transit infrastructure and services to ensure access to buses is available at all times and decrease the need for travel in	Transportation	▪ Reduces emissions ▪ Enhances resilience ▪ Improves health and wellbeing

Goal	Policy	Comp Plan Element	Co-Benefits
	single-occupancy vehicles. This includes: • Develop strategies that promote transit equity and community safety by considering the most vulnerable, then design and implement transit to support pedestrians, bicycles, mass transit, and individual cars, in that order. • Increase use of the park and ride system. • Implement fare-free transit within Port Angeles city limits. • Explore a high-occupancy vehicle lane on Highway 101 between Carlsborg and the Port Angeles Urban Growth Area. • Explore the feasibility of adding a high-speed electric or hybrid passenger ferry to Seattle. • Reference Clallam Transit's Comprehensive Operational Analysis for implementation *(Integrate Climate Resiliency Plan T-1, Action 30)*		▪ Improves air quality
Increase the resilience of transportation structures to floods, extreme precipitation events, sea level rise, and reduced snowpack.	Asses the following roads in conjunction with WSDOT for flooding and landslide hazards: ▪ Address Highway 110/La Push Road flooding ▪ Address Highway 112 and Route 113 flooding ▪ Relocate or better stabilize 101 and other main routes *(NODC Disaster Resiliency Planning)*	Transportation	▪ Enhances resilience
See above.	Protect and adapt critical facilities and their operations to reflect risks of sea level rise such as at the Black Ball Ferry Terminal and other essential public facilities.	Transportation	▪ Enhances resilience

Zoning & Development

The City manages land use and growth through zoning and development regulations. Goals and policies in the current plan address housing, commercial development, open space, and other uses. Suggestions for goals and policies reinforce avoiding hazards.

Table 2. Zoning & Development (includes site use, design, and other development facets)

Goal	Policy	Comp Plan Element	Co-Benefits
G-3A To guide land development in a manner that balances providing certainty about future land use and allowing flexibility necessary to adapt to future challenges and opportunities.	P-7A.10 Review all new development for impacts on climate change and adaptation to sea level rise through SEPA.[4]	Land Use	▪ Enhances resilience ▪ Provides cost savings ▪ Provides ecosystem services
See above	Protect infrastructure along waterfronts, including roads and structures, Evaluate risks of future building on coastal bluffs for sea level rise impacts. *(NODC Disaster Resiliency Planning)*	Land Use	▪ Enhances resilience ▪ Provides cost savings
G-8D To reduce the amount of impervious surface created by new developments and thereby reduce stormwater management costs and environmental impacts to the City and its natural resources, reduce development costs to private property owners, and provide safe and more attractive streets through traffic calming, safe pedestrian amenities, and improved street edge landscaping	P-6A.13 Encourage the use of Low Impact Development stormwater management techniques (such as vegetated roofs, permeable pavement, and bioretention) for all new developments.	Land Use	▪ Enhances resilience ▪ Provides cost savings ▪ Provides ecosystem services ▪ Reduces emissions ▪ Sequesters carbon
G-3H To provide opportunities for industrial development in a manner, which efficiently uses the community's natural resources and physical environment, has minimal impact on the natural environment, contributes to quality of life, and is compatible with the desired development patterns	P-3H.07 Through the SEPA process, consider the climate change impacts of any proposed new industrial activity or expansion before approval	Land Use	▪ Improves air quality ▪ Improves health and wellbeing ▪ Enhances resilience ▪ Reduces emissions ▪ Promotes equity and justice

[4] This policy would move under Land Use rather than Conservation Element.

Buildings & Energy

The City has a key role in ensuring both private and public buildings are designed to fit community character and support energy conservation by applying its zoning and building codes. It can also influence community responsiveness to climate hazards by how infrastructure is designed (e.g., trees in heat risk priority areas[5]).

The Port Angeles Comprehensive Plan encourages green building techniques, drought-tolerant vegetation, and energy efficient building designs. Adjustments to existing goals and policies are proposed to further reinforce resilience of buildings and sites including undergrounding of utilities and promotion of alternative energy.

Table 3. Buildings & Energy (includes generation, transmission, and consumption)

Goal	Policy	Comp Plan Element	Co-Benefits
G-3B To ensure residential land use and development is compatible with the environment with existing uses and residents, and with desired urban design in a way that increases resilience against climate impacts such as drought and extreme heat.	P-3B.06 Encourage residential development to preserve and capitalize on existing unique natural, historic, archaeological, and/or cultural features including promotion of native and drought tolerant vegetation and scenic views. Encourage new residential development to underground utilities to promote resilience. Encourage design of new residential development to maximize southern exposures and solar efficiency, protects from prevailing winds, and is designed to minimize energy use.	Land Use	▪ Enhances resilience ▪ Improves health and wellbeing ▪ Ecosystem services
Enhance energy and resource efficiency and diversify the grid to build resilience and capacity to prepare for increased energy demand.[6]	P-6A.12 Encourage the use of Green Building techniques for new developments and support Green Built certification for new developments to improve efficiency of new developments.	Land Use	▪ Enhances resilience ▪ Reduces emissions
See above	P-3H.06 Allow the conditional siting of clean-energy facilities (e.g., solar, wind, geothermal, wave, tidal) outside of industrial areas to increase the supply of renewable energy to the grid.	Land Use	▪ Improves air quality ▪ Reduces emissions

[5] See: https://parkserve.tpl.org/mapping/index.html?CityID=5355365#reportTop.

[6] This would be an added goal in the Land Use Element and existing policies (with amendments as needed) could be re-located under the goal. Or the goal could become a framework goal in the Conservation Element that is "cross cutting" across elements; relevant policies could be cross-referenced.

Goal	Policy	Comp Plan Element	Co-Benefits
See above	P-5D.10 Encourage the use of renewable energy in both the private and public sectors, providing all reasonable support and advocacy at the State level for regulations and incentives that encourage such installations. This may include strategies like incentivizing active and passive solar building design and leveraging existing Bonneville Power Administration programs (e.g., energy efficiency incentives) and state and federal funding sources.	Utilities and Public Services	▪ Improves air quality ▪ Reduces emissions
G-3KTo encourage the development of parks and recreational opportunities for all residents of the City and to increase access to natural areas in a manner that minimizes adverse impacts, and achieves the desired urban design of the City.	P-3K.04 Preserve and maintain unique or major physical features contained within the boundaries of City parks and recreational areas for access and enjoyment by residents of the community. Adapt parks and recreation facilities to reflect the risks of climate change including sea level rise, extreme heat, extreme precipitation, and drought. Prioritize actions based on the critical nature of the facility. Consider the relationship of facilities to emergency management and human health such as facilities used as community hubs. Consider business continuity and economic development, such as the wharf, beaches, and trails.	Land Use	▪ Enhances resilience ▪ Improves health and wellbeing
See above.	P-3K.05 Cooperate with the County and other jurisdictions in planning, funding, constructing, and managing multi-purpose recreation and transportation trails which link together various areas of the City, the Port Angeles Urban Growth Area (PAUGA), and other areas of the County and region. Adapt trail designs, materials, and locations to reflect the risks of sea level rise.	Land Use	▪ Enhances resilience ▪ Improves health and wellbeing

Emergency Management

The City provides emergency services including fire/emergency medical and police services. The City also participated in the 2015 Climate Change Preparedness Plan for the North Olympic Peninsula. Some of the policies in the 2015 plan are proposed for incorporation into the Comprehensive Plan to

improve alignment of the plans and addressing the range of climate-related events the City must consider to protect the community.

Table 4. Emergency Management (includes preparedness, response, recovery)

Goal	Policy	Comp Plan Element	Co-Benefits
Enhance emergency services to address response to extreme heat, drought, flooding, sea level rise, and wildfire.	Identify safe evacuation routes in high-risk debris flow and landslide areas. Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas. Evaluate current landslide warning systems to ensure effectiveness and efficiency and increase coordination between local jurisdictions. Strengthen response to landslides by incident management teams to increase resilience. *(NODC Disaster Resiliency Planning)*	Utilities and Public Services, Capital Facilities	▪ Enhances resilience ▪ Improves health and wellbeing ▪ Provides cost savings ▪ Protects ecosystem services
See above	Create Community Wildfire Preparedness Plan. Enhance Emergency Services to increase efficiency of wildfire response and recovery activities. Complete a new wildfire assessment that Wildland Urban Interface areas. Development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response. *(NODC Disaster Resiliency Planning)*	Utilities and Public Services, Capital Facilities	▪ Enhances resilience ▪ Builds community knowledge ▪ Improves health and wellbeing

Goal	Policy	Comp Plan Element	Co-Benefits
See above	Develop resilience hubs — community-serving facilities augmented to support residents and coordinate resource distribution and services before, during, and after a hazard event.	Capital Facilities	▪ Enhances resilience ▪ Improves health and wellbeing ▪ Builds community knowledge ▪ Promotes equity and justice

Agriculture

Port Angeles is an urban city, though there are limited inventoried croplands within the community based on the Washington Department of Agriculture.[7] The Port Angeles Comprehensive Plan Parks and Recreation Element suggests having community gardens or food forests (see P-10A.06). Similar themes are expanded upon in the Port Angeles Climate Resiliency Plan, Strategy CRW-1, #2 Local Food Security. To reinforce food security in the Comprehensive Plan, it is recommended that the expanded strategy be incorporated into the Comprehensive Plan Land Use Element.

Table 5. Agriculture (includes production and distribution)

Goal	Policy	Comp Plan Element	Co-Benefits
Make Port Angeles food secure by promoting regional sustainable agriculture, utilizing multiple sources for food procurement, and increasing food production within the City.	• Partner with North Olympic Development Council to designate funding to promote and establish urban sustainable agriculture/food forests. • Encourage partnerships between local farms/farmers and residents to establish local food production projects. • Work with the Community and Economic Development Department and Engineering Department to develop policies that foster agreement and resource availability systems for allowing gardening for food, habitat, or both in the right-of-way (e.g., planting strips) and explore irrigation incentives. • Leverage existing zoning regulations that encourage land use overlays for food production. *(Integrate Climate Resiliency Plan CRW-1, Action 2)*	Land Use	▪ Enhances resilience ▪ Promotes economic development ▪ Improves health and wellbeing

[7] See: https://nras.maps.arcgis.com/apps/webappviewer/index.html?id=3d61db30686d467ea6f5e0197be32b25.

Cultural Resources

Port Angeles has a historic waterfront downtown considered a maritime heritage area. Nearly all land within the city limits is considered at a very high risk of having archaeological resources.[8] Several tribes consider Port Angeles a tribal area of interest and the protection of usual and accustomed places for fishing and hunting is important.

Climate related impacts to cultural resources could include loss of cultural and historic sites due to more frequent and intense severe weather events such as extreme precipitation and sea-level rise. There could also be a loss of locally grown, temperature-sensitive foods that are culturally important (berries, shellfish, salmon, etc.).[9]

Table 6. Cultural Resources & Practices (historic sites and cultural resources and practices)

Goal	Policy	Comp Plan Element	Co-Benefits
Preserve culturally important resources and practices that are at risk to climate impacts such as protecting salmon populations from flooding. Protect and restore cultural and historical sites from coastal flooding and bluff erosion due to sea level rise.	Coordinate and partner with Tribal partners to implement regional climate resilience policies that protect culturally significant resources, land, and artifacts. *(Similar to Climate Resiliency Plan CRW-1, Action 3)*	Conservation	▪ Improves salmon recovery ▪ Protects tribal treaty rights ▪ Promotes equity and justice
See above	Protect, enhance, and restore ecosystems in order to meet tribal treaty rights and conserve culturally important consumptive and non-consumptive resources including foods, medicinal plants, and materials that could be adversely impacted by climate change.	Conservation	▪ Improves salmon recovery ▪ Protects tribal treaty rights ▪ Promotes equity and justice
G-7B To protect and enhance the area's unique physical features, its natural, historical, archaeological, and cultural amenities, and the overall environment.	P-7B.10 Encourage identification, preservation, and restoration of sites and structures that have historical or cultural significance.	Land Use	▪ Protects tribal treaty rights ▪ Promotes equity and justice

Economic Development

Port Angeles is the largest city in Clallam County, and a job hub. The City has a port district with maritime jobs, Olympic College, and federal facilities. It has a historic downtown with retail and waterfront recreational facilities attracting visitors, and it is a portal to Hurricane Ridge. The

[8] See: https://wisaard.dahp.wa.gov/Map.

[9] Comprehensive Plan Appendix A Community Profile notes that "all of the creeks that make up the Port Angeles watershed are used for fish habitat, but most have barriers to fish migration… The stream ravines provide sections of relatively high quality habitat, and are recognized by the State as sustaining significant populations of resident fish and potentially having salmon runs restored - once downstream impediments are removed…"

Comprehensive Plan has an Economic Development Element. New and amended goals and policies are proposed to incorporate relevant strategies from the Climate Resiliency Plan and to further address emergency preparedness and resilience for business continuity.

Table 7. Economic Development (includes business continuity, opportunities)

Goal	Policy	Comp Plan Element	Co-Benefits
Create and maintain economic growth by supporting a diverse and balanced local economy. Prepare for changes in recreation due to heat, wildfire, and reduced snowpack. Protect businesses, travel, and shipping routes with increased infrastructure resilience.	Assess climate migration impacts with forecasting every 5 years. Integrate those findings into the Comprehensive Plan, infrastructure plans, revenue and expense forecasting, and housing assessments. *(Integrate Climate Resiliency Plan CRW-1, Action 4)*	Economic Development (also add to Chapter 11 Implementation)	▪ Enhances resilience
See above	P-9A.12 Encourage businesses with low carbon footprints by providing fee reductions, permit facilitation, and/or implementing land use code changes, among other strategies.	Economic Development	▪ Reduces emissions
See above	P-9A.02 Promote long-term economic stability by encouraging businesses and industries to invest in modernization and environmentally sound, green technology.	Economic Development	▪ Reduces emissions ▪ Enhances resilience
See above	Ensure that the jurisdiction's Comprehensive Emergency Management Plan responds to the impacts of climate change and identifies roles and responsibilities to ensure a sustainable economic recovery after a disaster.	Economic Development	▪ Enhances resilience ▪ Improves health and wellbeing

Human Health

Extreme heat and rising temperatures, wildfires, and decreasing summer precipitation can adversely affect sensitive populations that are at risk of heat-related and air quality-related illnesses and death (e.g. heat-related deaths and illnesses, ozone and particulate matter and cardiovascular and respiratory illnesses, disease vectors-e.g. mosquitos). As summarized in the Planning Tool, the elderly, very young (e.g. under 5 years old), people with preexisting health conditions, and people without adequate housing are likely to be more affected.

Planning ahead and providing sufficient resources for human health is a role the City can support. See also relevant policies under Buildings & Energy, Emergency, Ecosystems, and other sectors that affect impervious surfaces, tree canopy, building design, and community hubs that can affect access to shade and clean air.

Table 8. Human Health (includes community well-being and engagement)

Goal	Policy	Comp Plan Element	Co-Benefits
Plan for and respond to extreme heat hazards on human health such as vector-borne illnesses, increased pollution, and increased heat-related illnesses, deaths, and hospitalizations.	P-7B.06 Protect air and water quality by minimizing pollution from new and existing sources including climate caused sources such as extreme heat, flooding, and sea level rise.	Conservation	▪ Improves air quality ▪ Enhances resilience
See above	Consider habitat reduction and population control for arthropod disease vectors (e.g., mosquitos, ticks) and zoonotic disease reservoirs (i.e. rodents) using integrated pest-management methods.	Conservation	▪ Enhances resilience
See above	Develop and implement a wildfire smoke resilience strategy in partnership with local residents, emergency management officials, regional clean air agency officials, and other stakeholders.	Conservation	▪ Improves air quality ▪ Enhances resilience

Ecosystems

The City has a wide range of critical areas (wetlands, streams, fish and wildlife conservation areas, geologic hazards, and flood hazard areas). It has marine shorelines. Proposed new and amended goals and policies focus on adapting current codes and practices to integrate climate adaptation and mitigation.

Table 9. Ecosystems (includes terrestrial and aquatic species, habitats, and services)

Goal	Policy	Comp Plan Element	Co-Benefits
G-7D To preserve and enhance the City's shoreline, its natural vegetation and wildlife and to mitigate for present and planned impacts in a manner consistent with the State Shoreline Management Act and the City's Shoreline Master Program.	P-7D.04 Preserve and protect aquatic habitats including shellfish habitat, and important marine vegetation by periodically evaluating and adapting fish and wildlife habitat policies and codes to adapt to and mitigate climate risks.	Conservation	▪ Sequesters carbon ▪ Enhances resilience ▪ Improves salmon recovery
G-3J To create open space within the urban landscape, retain natural landscapes, preserve fish and wildlife habitat, and to provide natural corridors connecting wildlife habitats.	P-3J.01 Preserve unique or major physical features such as marine shorelines, bluffs, ravines, streams, wetlands, wildlife habitat and other environmentally sensitive areas deemed of significant importance to the community as designated open	Land Use	▪ Sequesters carbon ▪ Enhances resilience ▪ Improves salmon recovery

Goal	Policy	Comp Plan Element	Co-Benefits
	space and those vulnerable to climate change impacts.		
Protect and preserve ecosystems by increasing resilience to climate hazards such as heat, flooding, drought, sea level rise, and reduced snowpack that pose a risk to forest productivity, pest outbreaks, fish and wildlife habitats, and water quality.	P-7B.16 Establish and implement an urban tree management program intended to retain and/or restore the overall tree canopy in the city by using plant materials as a unifying element and tool to protect the health, safety and welfare of the public, using the environmental services provided by trees to mitigate the negative effects of impervious surfaces and vehicular traffic such as increased temperatures, airborne particulates, carbon dioxide, nose, and stormwater runoff.	Land Use	▪ Sequesters carbon ▪ Enhances resilience ▪ Improves air quality ▪ Improves health and wellbeing
See above	Develop an identification and monitoring program for urban trees to analyze risks or impacts of pests and disease, factoring in climate impacts.	Land Use	▪ Enhances resilience ▪ Improves air quality ▪ Sequesters carbon

Waste Management

Port Angeles not only manages solid waste collection in the city, it also manages waste from most parts of Clallam County. Climate related impacts to solid waste could include increased waste due to extreme events (downed tree limbs, building rubble, roof shingles). New population growth could result in more solid waste and opportunities for recycling. Proposed goals and policies address increased demand for services and the need to prepare for post-disaster recovery.

Table 10. Waste Management (includes materials recycling and disposal);

Goal	Policy	Comp Plan Element	Co-Benefits
Prepare for the increased demand for solid waste and recycling collection and disposal.	P-8A.20 Participate with the County in the development, maintenance, and implementation of a regional solid waste plan, which addresses collection, disposal, and recycling of solid waste.	Capital Facilities	▪ Enhances resilience
Increase municipal cleanup and refuse capacity to prepare for increased need following extreme precipitation events.	Develop and implement a strategy to expedite the removal of waste (e.g., downed tree limbs and buildings blocking roads and streams) during and after a disaster incident to reduce the risks of subsequent fire, flood, injury, and disease vectors.	Capital Facilities	▪ Enhances resilience

Goal	Policy	Comp Plan Element	Co-Benefits
Reduce waste-related greenhouse gas emissions from wastewater and landfills.	Evaluate wastewater facility to reduce greenhouse emissions and build resilience to climate impacts such as landslides. This includes: • Maximize the co-generation and on-site utilization of natural gas from anaerobic digesters and other methods of harnessing energy in wastewater treatment. This will reduce vulnerability to power and fuel shortages, as well as reduce emissions. • Reduce vulnerability of access routes to the treatment plant and consider identifying alternative routes should primary routes be compromised. *(Integrate Climate Resiliency Plan (CW2-, Action #48)*	Capital Facilities	▪ Reduces emissions ▪ Enhances resilience ▪ Improves health and wellbeing

Water Resources

Climate impacts to water resources could include increased risk of flooding and drought, changes in water quality, changes in available water supply, and more demands on stormwater facilities. Some of these impacts are addressed under Ecosystems and Zoning and Development. This section focuses on water supply and conservation.

The City of Port Angeles manages a water system to supply municipal water, sourced from the Elwa River through groundwater recharge.[10] In addition to a water supply and distribution system, the City manages stormwater. The City's surface and groundwater system is at risk due to climate change impacts. Proposed goal and policy amendments address conservation and resilience.

Table 11. Water Resources (includes water quality and quantity)

Goal	Policy	Comp Plan Element	Co-Benefits
Prepare conservation strategies and protect water quality to increase resilience to drought, sea level rise, and reduced snowpack.	Water supply monitoring & enhancement to increase resilient during drought periods. *(Integrate Climate Resiliency Plan CRW-1, Action 5)*	Utilities and Public Services, Capital Facilities	▪ Enhances resilience

[10] Water is withdrawn from the Elwha River system via a Ranney collector that pulls in groundwater that is recharged from the river, per Water System Plan: https://www.cityofpa.us/DocumentCenter/View/5994/Water-System-Plan-2018?bidId=.

Goal	Policy	Comp Plan Element	Co-Benefits
See above	Reduce water consumption through education and incentive programs. For example: • Create a smart grid water use system and share data with consumers to increase conservation. • Promote and incentivize smart irrigation technologies for golf courses and parks. • Update water rates to discourage watering lawns. • Provide incentives for efficient food cultivation *(Integrate Climate Resiliency Plan CW-2, Action 55)*	Utilities and Public Services, Capital Facilities	▪ Enhances resilience
See above	P-7B.08 Maintain and enhance the quality of water resources through the regulation of clearing, grading, dumping, discharging, and draining and the provision of flood and erosion control measures and regulations to protect wetlands and other environmentally sensitive areas. Use adaptive management practices and best available climate science and projections to inform these efforts.	Utilities and Public Services, Capital Facilities	▪ Enhances resilience

Assessment of Vulnerability and Risk

The Resilience Guidance includes steps to assess vulnerability and risk of assets and hazards. Working with Commerce and the consultant team, City staff are evaluating a portion of the Port Angeles waterfront for assets and the potential for exposure, sensitivity, and adaptive capacity to climate change-exacerbated hazards with a focus on sea level rise.

This is a start toward implementing the Climate Resiliency Plan Strategy:

- **CRW-1.** Increase community capacity to respond to future climate change,
  - **Action 6** Sea Level rise vulnerability assessment of City Assets.

The map below, which incorporates climate modeling used in UW's Planning Tool, shows how rising sea levels could exacerbate the impacts of coastal flooding in downtown Port Angeles over the century. This would increase risks for important, vulnerable assets such as the transit center, ferry terminal, wharf, and coastal parks. Goal and Policy recommendations have been refined to reflect the preliminary vulnerability and risk evaluation.

Figure 1. Projected Sea Level Rise – Downtown Port Angeles

Sources: BERK, Cascadia, Port Angeles, Clallam County.

Use of Recommendations

The evaluation of Port Angeles' Comprehensive Plan under the draft Resilience Guidance is meant to provide a resource for the City to enhance its Comprehensive Plan to continue to effectively plan for all aspects of the community while considering the effects of climate change on its people and places.

All of the ways Port Angeles plans, permits, and responds to community needs are considered, including growth management, land use, transportation, utilities and public services, housing, conservation, capital facilities, economic development, and parks and recreation.

Once the City vets and considers how best to amend its comprehensive plan to reflect its needs, the City can wrap the potential amendments into its annual docket or next periodic review. The Model Element Resilience Guidance allows each jurisdiction to decide on how best to integrate climate resilience goals and policies, such as to list all climate element goals and policies (mitigation and resilience) in one climate chapter (or in Port Angeles' Conservation Chapter), or to integrate them into several chapters/elements (Land Use, Housing, Transportation, etc.). A jurisdiction could also do a combination of central and dispersed goals and policies.