Roadmap to a Climate Action Plan

Port of Bellingham

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PORT OF BELLINGHAM
Washington State

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ECONorthwest prepared this Roadmap to a Climate Action Plan for the Port of Bellingham. It received substantial assistance from the Port of Bellingham staff, including Adrienne Hegedus and Brian Gouran, among others. Other firms, agencies, and staff contributed to other research that this report relied on. That assistance notwithstanding, ECONorthwest is responsible for the content of this report. The staff at ECONorthwest prepared this report based on their general knowledge of urban, transportation, and natural resource planning, and on information derived from government agencies, private statistical services, the reports of others, interviews of individuals, or other sources believed to be reliable. ECONorthwest has not independently verified the accuracy of all such information and makes no representation regarding its accuracy or completeness. Any statements nonfactual in nature constitute the authors' current opinions, which may change as more information becomes available. ECONorthwest staff who contributed to this report include Adam Domanski, Jennifer Cannon, Annalise Helm, and Sarah Reich.

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Executive Summary

This report presents a "Roadmap" to develop a Climate Action Plan for the Port of Bellingham (Port) that will identify actions that mitigate the Port's contributions to climate change and help it adapt to the impacts of a changing climate. This comprehensive Climate Action Plan will leverage the Port's ongoing sustainability efforts, set climate goals, and identify strategies to meet those goals.

This Roadmap provides context, presents preliminary background information, and offers overarching direction on the process, scope, potential outcomes, and critical decision points for developing the Climate Action Plan in 2020. It integrates a summary of existing Port operations, an evaluation of broader trends in local-level climate action planning, and a set of guiding principles that will serve as the structure for Plan development. The Climate Action Plan will rely on a multi-pronged approach that combines technical analyses of the Port's greenhouse gas contributions and climate vulnerabilities with a stakeholder-driven process that outlines meaningful and attainable actions the Port can take to prepare for the future.

The Climate Action Plan will be developed based on the process outlined in this Roadmap in collaboration with Port and regional stakeholders. The work will begin with additional data analysis and information collection needed to build a platform of knowledge that describes the mechanisms of climate change and how they may affect the Port. Key steps for this initial phase are an audit of the Port's current sustainability efforts, a review of relevant literature and climate action planning best practices, and a stakeholder-defined visioning process. Subsequently, a greenhouse gas inventory and vulnerability assessment will be conducted. This crucial knowledge will shape goals, associated strategies for achieving them, and a set of performance measures for monitoring the Port's progress. Part of this work will include an analysis of which actions have the most opportunity and the highest likelihood of success. The work completed under this Roadmap will culminate in a draft review and revision process to establish the finalized Climate Action Plan for the Port.

Ultimately, this Roadmap will produce a Plan that will be relevant, achievable, and flexible over a five-year planning horizon, set within the context of broader long-term aspirational targets. This will ensure that the Port is prepared to continue to serve as a regional economic engine in an environmentally, fiscally, and socially sustainable way.

1. Introduction

1.1. Climate Change Resiliency Risks

The amount of various greenhouse gases present in the atmosphere has increased to the point that it is beginning to cause measurable threats to the environment, human health, and the climate. These gases, the most well-known of which being carbon dioxide, warm the Earth, resulting in melting snowpack and ice caps, drought, and extreme weather events, among many other hazards. Scientists agree that these threats are going to continue, and in some cases, accelerate[1], and that the emissions that cause them are largely produced by the burning and use of fossil fuels.[2]

For the State of Washington, the City of Bellingham, and the Port of Bellingham (the Port) in particular, the threats include rising sea level, ocean acidification, and an increase in extreme storm events. According to a 2018 assessment conducted by the University of Washington, Bellingham Bay can expect to rise between 1-2 feet over the next 80 years.[3] This increases the risk of intermittent flooding and damage to Port infrastructure and buildings. More frequent and intense storm events could also cause flooding and additional damage to infrastructure. Ocean acidification (OA) poses a substantial risk to the region because of its effect on both wildlife and on the economy. OA is the result of the ocean absorbing 25% of the human-produced carbon emissions, which causes the ocean's pH level to change.[4] This acidification is detrimental to marine species that depend on growing a calcified shell to survive and affects more than 30 percent of the marine species in Puget Sound.[5] Many species' other functions are hurt by OA, including photosynthesis, growth, respiration, and reproduction.

As a result, any portion of the regional marine economy that depends on these species is also at risk. For example, the shellfish aquaculture industry in Washington contributes an annual economic impact of $270 million and helps to employ 3,200 people statewide.[6] 2013 data found

[1] Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy. Washington Department of Ecology, Olympia, Washington. Publication no. 12-01-004, pg. 3.

[2] Washington State Blue Ribbon Panel on Ocean Acidification (2012): Ocean Acidification: From Knowledge to Action, Washington State's Strategic Response. H. Adelsman and L. Whitely Binder (eds). Washington Department of Ecology, Olympia, Washington. Publication no. 12-01-015, pg. xi.

[3] Interactive Sea Level Rise Data Visualizations from Sea Level Rise in Washington State – A 2018 Assessment, Miller et al. for Whatcom County, WRIA 1 Nooksack. https://cig.uw.edu/our-work/applied-research/wcrp/sea-level-rise-data-visualization/

[4] WDE 2012, Ocean Acidification, pg. 11.

[5] Ibid.

[6] Washington Shellfish Initiative white paper, December 2011, http://www.governor.wa.gov/news/shellfish_white_paper_20111209.pdf

that commercial fishing activity at Squalicum and Blaine marinas for the Port alone represented 1,781 direct jobs. These may be affected by climate impacts on marine species.[7]

The costs of these climate threats include potential direct losses to the marine economy, job losses, increased repair and replacement costs to damaged infrastructure, among others. If action is not taken to mitigate the Port's contribution to carbon emissions and adapt to these coming changes, the costs may only increase over time. Preparation and adaption can make the impact of rising sea levels, increased storm severity, and changing fish and shellfish stocks much easier to bear. Washington State estimates that if no action is taken, the potential costs to Washington for climate change impacts are nearly $10 billion per year by 2020.[8] Acting now creates an opportunity to not only protect the local economy, community, and the Port itself against coming changes, but also a chance to become aligned with other ongoing climate policy efforts.

1.2. The Port of Bellingham

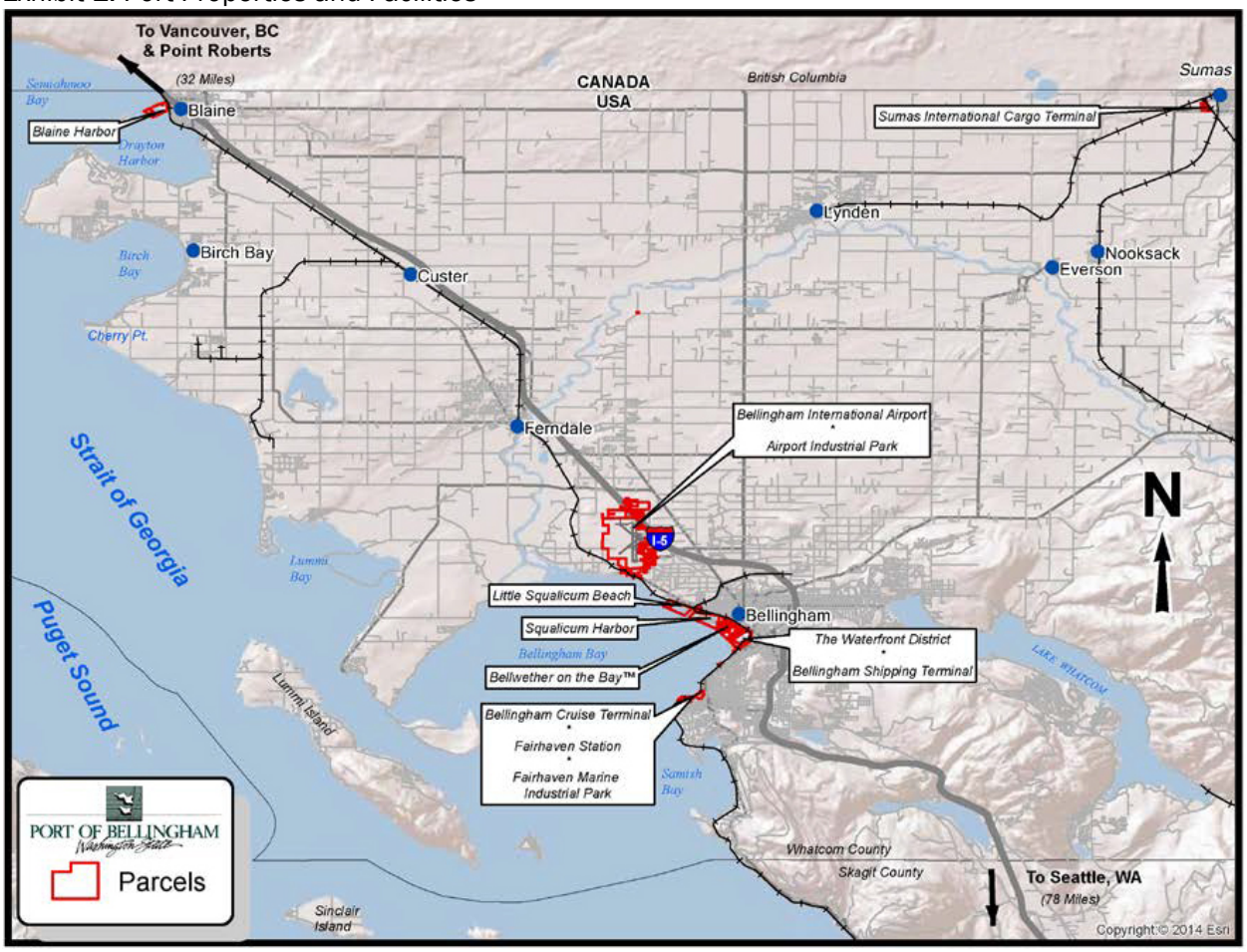
As a county-wide special purpose district, the Port owns and/or operates certain properties within the City of Bellingham and in various locations in Whatcom County, the Port is strategically positioned in northwest Washington State and south of British Columbia, Canada (Exhibit 1). The Port will soon celebrate its 100th anniversary since its establishment as a special purpose district in 1920. The Port continues to build and sustain essential trade and transportation infrastructure that has been crucial to visitors and residents traveling and moving goods within and through the region by water, air, and land. Recent figures suggest that Port activity represents nearly 10 percent of the Whatcom County economy by operating an airport, a shipping terminal, a harbor, two marinas, leasing a mixture of real estate and industrial lots, and maintaining a system of public parks, trails, and boat launches.[9]

[7] Port of Bellingham, Economic Impact Study, www.portofbellingham.com/801/Economic-Impact-of-Commercial-Fishing

[8] WDE 2012, Preparing for a Changing Climate, pg. 3.

[9] Port of Bellingham. (2013). *2013 Sustainability Report*. Retrieved December 2019 from: www.portofbellingham.com/100/Sustainable-Strategies.

Exhibit 1: Port Properties and Facilities



Source: Port of Bellingham, 2016 Comprehensive Scheme of Harbor Improvements Plan

Existing Port Operations

The Port manages a wide variety of business operations that serve as a driver for the regional economy. Exhibit 2 lists current Port operations and highlights the broad range of offerings and departmental expertise.

Exhibit 2: Port Operation Departments

Marine and Aviation	Community and Economy	Administration	Land Management
Bellingham International Airport	Community and Environment	Engineering and Facilities	Real Estate
Cruise Terminal	Economic Development	Maintenance	Waterfront District
Shipping Terminal	Emergency Management and Security	Events	Public Lands
Squalicum and Blaine Harbor	Business Development	Executive/ Finance/ Human Resources	Planning and Development

Source: Port of Bellingham. (2019). Retrieved December 2019, from: www.portofbellingham.com/

The Bellingham International Airport, marinas, and real estate divisions make up the largest portion of Port business and operations. The airport serves local commercial airlines, chartered

planes, as well as air cargo planes. Trade also comes through the shipping terminal, which provides a range of services for bulk cargo handling and distribution, as well as ship repairs, tank cleaning, and shore power.

With moorage available in both Blaine Harbor and Squalicum Harbor in Bellingham, the Port serves both recreational and fishing vessels at their marinas. The cruise terminal serves as the southern terminus of the Alaska Marine Highway System and sees more than 200,000 passengers each year[10]. The Port also operates public boat launches in Blaine, Bellingham, and Fairhaven.

The Port's real estate portfolio is a substantial portion of its business and is made up of approximately 1.3 million square feet of office, commercial and industrial building space on Port property. Most of these properties are leased out to a wide variety of tenants and businesses, which is just one way the Port is involved in economic development. The Port also participates in the Whatcom County Regional Economic Partnership[11] that stretches across the county and into Canada and creates opportunities for businesses in Bellingham and the broader region.

The Port has several environmental programs that include salmon recovery, environmental cleanup projects, and stormwater management. In total, the Port manages over 1,500 acres of publicly owned lands, some of which offer public access to the waterfront and include trails, boat ramps, educational exhibits, and beaches.[12] The Port also operates an internal sustainability program to help guide decisions and develop strategies for energy efficiency, resource conservation, recycling/waste reduction, and environmental stewardship of public assets.

Internal Planning Questionnaire

Initial input was collected from Port staff on their thoughts and preferences for a Climate Action Plan. This step set the stage for future collaboration and ensured that this Roadmap reflects current staff knowledge and priorities. An internal planning questionnaire was completed by Port staff in key roles and a Port Commissioner, plus several smaller interactive meetings and interviews were held at the Port to gain additional input.[13] This feedback provided valuable insights on Plan elements and stakeholder involvement (more detail is provided in Appendix A, Planning Questionnaire, and Appendix B, Questionnaire Results). The collective input, presented below as key themes, was used to shape this Roadmap and to ensure that it is relevant, useful, and targeted.

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[10] Port of Bellingham Website, Cruise Terminal: https://www.portofbellingham.com/193/Bellingham-Cruise-Terminal

[11] Whatcom Regional Economic Partnership, Regional Strength Through Economic Diversity: http://choosewhatcom.com/wp-content/uploads/2019/06/POB-Booklet-Web2019.pdf

[12] Port of Bellingham. (2013). *2013 Sustainability Report*. Retrieved December 2019 from: www.portofbellingham.com/100/Sustainable-Strategies.

[13] Two planning discussions were held on 11/25/19 and 12/12/19.

Internal Port stakeholders identified the following resources and assets for climate action planning:

Resources

- Staff knowledge, talent, experience, and capacity to help with environmental planning.
- Existing emergency preparedness response team at the Port and emergency planning work in the area.[14]
- Openminded leadership and flexibility as an institute.

Assets

- The Port is well suited to become a leader for other Ports because it has an advantage as a waterfront manager of a large area, an agency with a mission of sustainable economic development, and an owner of highly visible transportation terminals.
- Ability to build on existing relationships with regional planning entities to ensure a Port Plan is coordinated.

"Not many Ports have undertaken climate action planning in Washington, which provides an opportunity to look at Port specific issues and potentially leverage outside resources. We can provide statewide leadership to other ports and statewide in the [Washington Public Ports Association]."

[14] Whatcom County, the City of Bellingham, and Port of Bellingham are working on a tsunami marine mitigation playbook with the Washington State Emergency Management Division and the Federal Emergency Management Agency.

Internal Port stakeholders recognized the following challenges related to climate change:

Short-Term

- Recovering from shoreline damage impacts.
- Increasing storm intensity and flooding.
- Increased wildfire risk.
- Lack of emergency preparedness.
- Impacts on fisheries and threats to wildlife dependent on fish.
- Transportation and shipping service interruptions due to more intense, frequent storms.
- Port infrastructure hazards, risks, and safety concerns (such as dock safety, pylon heights able to withstand rising waters, seismic retrofitting of buildings).
- Financial challenges associated with repairing damaged Port infrastructure.
- Lack of knowledge of sustainability programs.

"Short-term concern of increased failing infrastructure and shoreline damages due to more frequent and intense storms. Concern that past/current sea-level rise expectations are too conservative."

"Assessing the vulnerability of critical infrastructure will be a challenging first step toward meaningful mitigation."

Long-Term:

- Sea-level rise's impact on infrastructure.
- Changes in acidity and water temperature impacts on fisheries and shellfish production.
- Increased uncertainty and impacts on commercial fishing, agriculture and food supply, marine trades, shipping, and transportation.
- Impacts on infrastructure planning and investment in marine trades, shipping, and transportation.

"According to a report published by the Center for Economic and Business Research at Western Washington University, over 6,000 jobs are created or supported by the marine trades representing 7% of Whatcom County's total workforce."

1.3. Existing Climate Action Plans and Resiliency Policies

A Climate Action Plan allows an entity to identify risks due to the effects of climate change and develop strategies to manage these impacts. As sea-level rises, average temperatures increase, and weather events increase in frequency and intensity, it is critical to make investments based on expected future conditions, rather than historical patterns.

To strategically respond to the changing climate, many local governments are developing climate action plans. Several frameworks guide these planning processes:

- STAR Communities rating system uses a Leadership in Energy and Environment Design (LEED) rating system structure. The STAR guide offers metrics, information, and case studies that local entities can use to measure local-level resilience and learn about best practices. This system is currently undergoing updates.[15]
- Local Governments for Sustainability (ICLEI) uses Five Milestones for climate action planning. As of 2019, over 600 local jurisdictions in the US have developed climate action plans under this framework, which consists of a greenhouse gas emissions inventory, setting reduction targets, developing a Climate Action Plan, implementing policies, and monitoring results. [16]
- United Nations Habitat Guiding Principles for City Climate Action Planning, a set of globally applicable principles to serve as a common benchmark for cities around the world undertaking climate action planning.[17]

In Washington State, many counties, cities, and local entities have developed climate plans over the last decade based on these and other frameworks. These plans reflect the individual circumstances and culture of each entity, but they all contain common elements: carbon emission reduction targets and a recommended set of potential policies that could help the entity reach that target. The level of detail varies across plans, but overall the plans help entities focus on specific goals for addressing climate change.

Two main approaches exist to address the impacts of climate change.

1. The first is a **mitigation** approach that attempts to limit an entity's contribution to greenhouse gas emissions and to mitigate the entity's current emissions. This strategy tries to slow down the effects of climate change and reduce its severity.
2. The second is an **adaptation** approach, which is the process of planning for and adjusting to the impacts of climate change (i.e., rising sea-level and extreme storm events). This allows entities to improve their resilience and ensure a more stable future.

Once an entity has a clear picture of their current contributions to emissions and has identified their critical risks associated with climate change, they can use these two approaches to plan for the future.

The Port is well situated to begin thinking about their climate risks and goals since they will need to consider the requirements imposed by climate plans developed by both the City of

[15] STAR Communities. (2019). Retrieved December 2019 from: http://www.starcommunities.org/.

[16] ICLEI USA, Local Governments for Sustainability (2019). Retrieved December 2019 from: http://icleiusa.org/about-us/who-we-are/.

[17] United Nations Human Settlements Programme. 2015. *Guiding Principles for City Climate Action Planning*. Version 1.0. Retrieved December 14, 2019, from http://e-lib.iclei.org/wp-content/uploads/2016/02/Guiding-Principles-for-City-Climate-Action-Planning.pdf

Bellingham and Whatcom County. In 2019, the City of Bellingham adopted a Climate Action Plan that set carbon emission reduction goals for municipal and community sources to be achieved by 2035.[18] Whatcom County is beginning to update its Climate Protection and Energy Conservation Action Plan (2007) as well. This Plan will set additional targets and will likely place new requirements on the Port. Statewide, Washington's legislature set a target to reduce emissions at least 25 percent below 1990 levels by 2035.[19]

Four other ports in the state of Washington have policies or plans related to long term sustainability or climate change action (see the complete list in Appendix C: Ports of Washington). The Port of Seattle has the most comprehensive set of strategies, and these are housed within their broader Century Plan. Considering the lack of existing Climate Action Plans at other ports, the Port of Bellingham has an opportunity to be a model for other Washington ports in climate action planning.

Establishing a Climate Action Plan for the Port presents an opportunity to partner and coordinate with the city, county, and state, as well as set the standard for climate action planning for other mid-size Washington Ports.

Range of Climate Action Plans

Climate action plans vary in their focus and purpose. In particular, they differ in the types of goals they set, the level of detail in the actions they identify, and their emphasis on educating their audience on climate change action.

Existing climate action plans in the region can be organized into three general categories:

- **Action-Oriented**: This type of plan sets out concrete steps, projects, and strategies to achieve its emissions reduction and adaptation goals. A path forward is clear, and specific items are outlined as part of the plan.
- **Aspirational**: In this category, plans document guiding principles, goals, and climate change priorities. Aspirational plans tend to lack detail and clarity on the specific steps and future policy actions.
- **Educational**: In an educational plan, most of the emphasis is on ensuring that the public understands the potential risks of climate change and the role that an entity is playing in contributing to climate change. An educational plan may discuss potential policies to mitigate or adapt but mainly strives to create a shared understanding of the issues at hand.

[18] 85% below 2000 levels by 2030 for municipal sources, 75% below 2000 levels by 2030 for community sources, 100% below 2000 levels by 2035 for all sources. The City of Bellingham. (2018). *City of Bellingham Climate Protection Action Plan, Greenhouse Gas Monitoring Report.* Retrieved December 2019 from: www.cob.org/services/environment/climate/Pages/program.aspx.

[19] Washington Governor. (2019). Retrieved December 2019 from: https://www.governor.wa.gov/issues/issues/energy-environment.

Exhibit 3 compares other climate action plans within and near Whatcom County to illustrate the general trends and common components of plans. This summary defines potential elements of the Port's Climate Action Plan and establishes its regional context. Other elements of successful Climate Action Plans may exist, but were either not present in the plans evaluated or did not appear in initial research.

Exhibit 3. Comparison of Local Climate Action Plans

Entity	Type of Plan	Goals and Priorities	GHG Inventory	Immediate CO_2E Reduction by 2030	Long-term CO_2E Reduction by 2050	Vulnerability Assessment	Mitigation and Adaptation Plan	Identifies Stakeholders
City of Bellingham	Action-Oriented Plan	Yes	Yes	Yes	Yes			Yes
Whatcom County	Action-Oriented Plan	Yes	Yes	Yes				Yes
Western WA University	Aspirational Goal Setting	Yes	Yes	Yes	Yes			
Lummi Nation	Action-Oriented Plan / Aspirational Goal Setting	Yes			Yes	Yes	Yes	
City of Everett	Action-Oriented Plan	Yes	Yes	Yes		Yes	Yes	Yes
Skagit County	Aspirational Goal Setting / Educational	Yes	Yes	Yes	Yes			Yes
Port of Vancouver	Aspirational Goal Setting	Yes	Yes					
Port of Seattle	Action-Oriented Plan / Aspirational Goal Setting	Yes	Yes	Yes	Yes		Yes	
Port of Olympia	Aspirational Goal Setting	Yes	Yes			Yes		
Port of PortAngeles	Aspirational Goal Setting	Yes						

Action-Oriented Plan Aspirational Goal Setting Educational Yes

Action Plan Elements

Many climate action plans integrate commonly used action plan concepts. Action planning tools offer a blueprint for moving from aspirations to action to positive outcomes. An **Action Plan** describes the steps an organization will implement to meet its goals. Most action plans tend to be relatively short-term (1 to 5 years) since shorter time horizons make plan management and implementation more achievable. However, these plans often identify actions in the middle to long-term timeframes, in the case that resources might not be available immediately and additional information might still be needed, so that the action can be taken later.

Action plan features for the Port's Climate Action Plan and examples are described in Exhibit 4.

Exhibit 4. Action Plan Features Proposed for the Port of Bellingham Climate Action Plan

Plan Feature	Examples
A **Vision Statement** articulates an ideal outcome in the future that the organization is working towards accomplishing. The vision is typically no longer than a few sentences and should be simple. A vision statement provides direction and can serve as the anchor for guiding the overall purpose of a plan. Broad stakeholder participation and buy-in on a proposed vision can bolster support and propel action.	"This updated Climate Action Plan will help lead the transition away from fossil fuels to renewable energy, and at the same time improve the lives of our residents and visitors, grow our local economy, and create a more sustainable and equitable future for Bellingham" – City of Bellingham CAP[20]
Goals are general statements on what should be accomplished. They provide direction for community decisions. Goals should be simple and comprehensively summarize the intended outcomes and guidelines for action and decision making.	"The goal of the CCMAP is to identify the potential impacts of climate change on the natural, social, and built systems of the Reservation and to identify actions to minimize the causes of climate change and damages from impacts that cannot be avoided." – Lummi Nation CCMAP[21]
Strategies provide more detail on how to achieve overarching goals. There is often more than one strategy associated with each goal. Strategies can focus on changing behaviors, inducing action at the community-level, or establishing a process or policy.	• Mitigation Plan- energy efficiency improvements • Adaptation Plan- infrastructure updates to improve resiliency to sea-level rise
Measuring Performance through Targets or Benchmarks helps evaluate the performance towards achieving established goals. They typically include a start year, length of time, and target. Measures can include quantitative data or qualitative assessments.	• Greenhouse Gas Inventory- track current emissions and measure performance against reduction targets • Vulnerability Assessment- manage current risks, assess the impact of new projects on reducing risk

Data Sources: Community Toolbox. (2019). Retrieved December 2019 from: https://ctb.ku.edu/en; Center for Land Use Education, (2005); American Planning Association Professional Institute. (2014). *Strategic Planning, Plan Making and Implementation, the Planning Process*; and NS Hack et al. (2013). *Local Planning: Contemporary Principles and Practice 1st Edition.*

[20] City of Bellingham Climate Action Plan 2018 Update, pg. 3

[21] Lummi Nation Climate Change Mitigation and Adaptation Plan: 2016-2026, pg. 5

2. Guiding Principles and Plan Scope

2.1. Guiding Principles

This section outlines the proposed guiding principles and expectations for the Port's Climate Action Plan. The following guiding principles were informed by feedback from Port stakeholders.

1. The Climate Action Plan will support the Port's mission to promote sustainable economic development, optimize transportation gateways, and manage publicly owned land and facilities to benefit Whatcom County.[22]
2. The Climate Action Plan will build on information previously developed for the Port and will reflect knowledge of staff and stakeholders regarding climate change and sustainability.
3. The Climate Action Plan will reflect the best available data and science relevant to the Port.
4. The Climate Action Plan will provide clear, transparent project information to increase stakeholder awareness of and preparation for climate change impacts.
5. Outcomes of the Climate Action Plan should be achievable and support the Port's identity as a local economic driver.

The vision and goals for the Port Climate Action Plan will be subsequently developed collaboratively with stakeholders. They are expected to offer direction and serve as the anchor for guiding the overall purpose of the Climate Action Plan. Initial goals for mitigation and adaptation to climate change collected from internal Port stakeholders are summarized below. These goals are expected to be discussed and developed further during Plan development.

Initial mitigation goals identified by internal stakeholders:

- Carbon neutrality goal by 2040/2050 for Port operations.
- Waste reduction at Port facilities.
- Increased energy efficiency at Port facilities.
- Natural hazard mitigation.
- Switch to renewable energy.

"I see value in setting a goal, even aspirational, for carbon neutrality by 2050 achieved through measurable reduction target benchmarks at 5-year intervals and an overall reduction/mitigation goal. Mitigation goals should be bold, achievable, cost-effective, and scaled to Port operations."

[22] Port of Bellingham. (2019). *The Port of Bellingham Mission Statement.* Retrieved December 2019, from: https://www.portofbellingham.com/

Initial adaptation goals identified by internal stakeholders:

- Prepare for sea-level rise and increased flooding.
- Assess vulnerability at the Port and identify the greatest risks.
- Invest in building resilient infrastructure.
- Improve waterfront infrastructure.
- Prepare for industry changes, focusing on industries relevant to the Port.

Internal Port stakeholders also recognized that climate change and climate action planning might carry costs that should factor into the planning process. These potential costs are summarized below.

Potential costs identified by internal stakeholders:

- Costs to fishing industry (e.g., reduced fish stocks, increased fuel requirements, etc.).
- Changing the market value of the real estate portfolio.
- Costs of Port infrastructure, and for Port owned land.
- Cost of no action.

"It would be great if we could also calculate the cost of doing nothing. What is the impact on local landfills, energy consumption, emissions? Not to mention the reputation and ethical costs."

The Port Climate Action Plan will identify actionable strategies that support meeting different mitigation and adaptation goals. A broad range of strategies will be identified, and these different strategy options will be evaluated and prioritized. Below is a list of different ways that strategies could be assessed.

Ways to assess and prioritize different strategies:

- Opportunity/Probability comparison.
- Comparison of relative benefits and costs.
- Assessment of relative importance and urgency.
- Evaluation of the ease of implementation.
- Evaluation of how strategies would align with ongoing regional efforts.
- Solicitation of input from key stakeholders.

Exhibit 5: Opportunity-Probability Matrix

2.2. Scope of the Climate Action Plan

The Port's Climate Action Plan will focus on achievable goals and actionable strategies. To this extent, the Plan will include all elements of internal operations that the Port has control over and will identify specific actions over the next five years while setting aspirational targets for a broader time horizon.

The Climate Action Plan will be designed to evolve iteratively and will be integrated into policy or planning documents to support its longevity. To build momentum, the Port's Climate Action Plan will initially focus on low-cost strategies that are feasible to put into practice quickly with minimal operational disruptions. Further specific elements of the scope of the Climate Action Plan are listed below:

- The Climate Action Plan will be developed to support the Port's role as a regional economic engine.
- Actionable goals and strategies will be developed for a five-year planning horizon.
- Aspirational targets will be set for longer-term planning horizons.
- The greenhouse gas inventory will quantify emissions that are the direct result of Port operations. The scale of downstream customer emissions will be described qualitatively.
- The vulnerability assessment will focus on Port infrastructure and will be designed to inform future capital investment decisions.
- Mitigation and adaptation strategies will be focused on internal Port operations, with the evaluation of opportunities to expand the scope to include tenant participation.

3. Plan Development Process

The Climate Action Plan will be developed from March through December 2020, across five distinct process elements that will build a platform of knowledge and vision for climate action planning and then will conclude with strategy development and Plan finalization. These five process elements are as follows:

1. **Background Research and Vision Creation**
    a. Review of literature, policy guides, and case studies on best practices for climate action planning.
    b. Development of educational background that creates a scientific context.
    c. Creation of a vision statement for the Plan informed by stakeholder values and input.
2. **Data Analysis**
    a. Completion of a Greenhouse Gas Inventory that accounts for the Port's contributions to climate change.
    b. Completion of a Vulnerability Assessment that identifies Port assets at the highest risk from climate change threats.
3. **Alignment and Goal Development**
    a. Identifying elements of other regional climate plans (i.e., City of Bellingham, Whatcom County, Washington State) to facilitate goal alignment.
    b. Development of actionable and attainable five-year mitigation and adaptation goals.
4. **Strategy Development**
    a. Using the results of the Greenhouse Gas Inventory to identify actionable Mitigation Strategies for reducing the Port's emissions.
    b. Using the results of the Vulnerability Assessment to develop Adaptation Strategies that incorporate climate risks into capital investment decisions.
    c. Identify performance measures and develop a Monitoring and Adaptive Management plan.
5. **Plan Finalization**
    a. Completion of a draft Plan available for technical review.
    b. Completion of a final Climate Action Plan produced in a visually-appealing and accessible InDesign layout.

Each of these elements combines different levels of technical analysis and stakeholder involvement.

3.1. Participation and Decision-making Structure

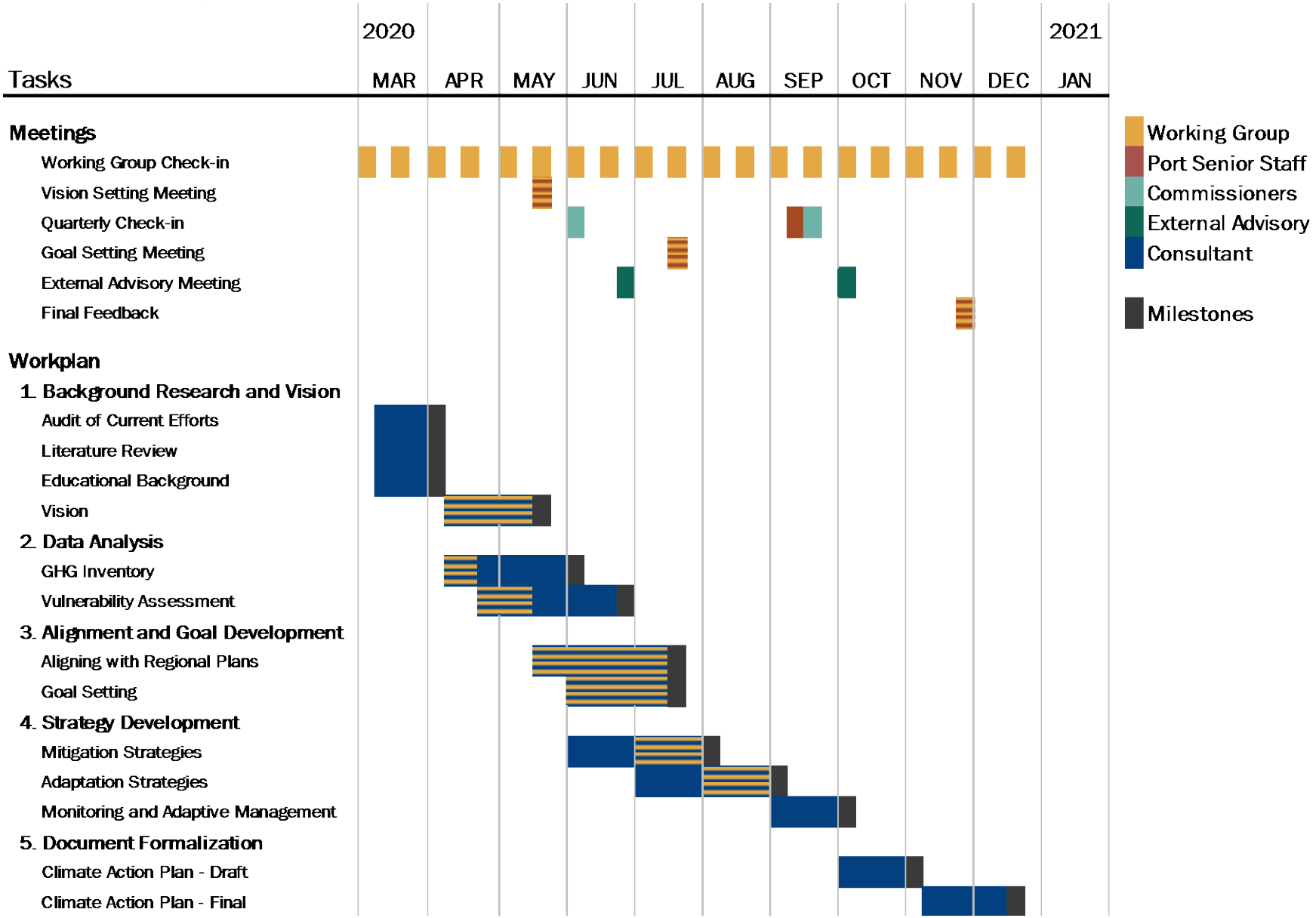
Port Commissioners, staff, and customers are important to the climate action planning process, particularly since they are vital in propelling implementation. Various Port representatives and stakeholders will be involved regularly during project milestones, and when recommendations are needed. Their input, along with the technical research and work, will help ensure that the resulting Plan is relevant, useful, and achievable. Stakeholders are defined at four distinct levels of involvement:

1. **Working Group** – A small group of internal staff with technical expertise and diverse port knowledge that will review project materials; offer informed recommendations and input particularly related to planning milestones and; solicit feedback to build support towards successful outcomes.
2. **Port Senior Staff –** Comprised of Port Divisional Directors and senior management staff, this group will be advisory and focused on guiding the Plan vision and goals, it will provide insights on key results and support in finalizing mitigation and adaptation strategies.
3. **Commissioners** – Port Commissioners will provide oversight and guidance regarding the Plan vision and goals, review key results, and make final decisions on Plan adoption.
4. **External Advisory Group** – An external advisory group representing key stakeholder interests external to the Port will be invited to participate during critical decision points.

3.2. Process Map

The steps, meetings, milestones, and the associated timeline are illustrated below as a Process map (see Exhibit 6). This demonstrates which steps can happen concurrently, like the greenhouse gas inventory and the vulnerability assessment, and it also outlines when collaboration between the various stakeholder groups is most necessary. The blue and yellow striped blocks show critical periods of collaboration. The top section of the map also displays a proposed schedule for meetings with all levels of those involved in developing the Climate Action Plan. Some meetings will include multiple groups while some will have a limited number of participants.

Exhibit 6: Process Map March 2020- December 2020



3.3. Guidance on Information Sharing

Climate action planning often involves regular information sharing with different audiences. Below are insights provided by surveyed Port stakeholders. This information helps guide how information should be shared and communicated.

- Share information through smaller interactive meetings/workshops, presentations, email, social media, website, reports, focus groups, and easy to complete surveys.
- Infographics should be integrated to augment comprehension and improve clarity.
- Communication should focus on feasible actions. Climate action planning communication should emphasize how the Plan will increase resiliency. Information should be produced on how mitigation and adaptation strategies could help activate the economy (i.e., job creation, cost savings, etc.).

3.4. Technical Components

Specific technical elements of the Climate Action Plan are described below.

Greenhouse Gas Inventory

A key step in understanding the existing port conditions and in identifying relevant mitigation strategies is to inventory Greenhouse Gas (GHG) Emissions at the Port of Bellingham. This analysis identifies sources of emissions produced directly by Port operations and their respective share of total Port emissions. This analysis begins in early April 2020 and is collaborative with Port staff on data gathering.

The main steps for creating a GHG Inventory[23,24] are:

1) Define the scope of emissions: What types of emissions will be included? What types of sources will be considered?
2) Identify sources of emissions such as electricity and heat used by departments, customers and facilities, capital projects, and transportation. Typically, the main emissions sources are from electricity, natural gas, and fuel consumption.
3) Investigate data sources for emissions such as utility services, fuel receipts, gas bills, information from fleet managers, and Port records.
4) Organize data and calculate emissions.

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[23] Bay Area Air Quality Management District. (2009). *Conducting a Municipal Greenhouse Gas Inventory: A Practical Guide, Strategic Energy Innovations.* Retrieved December 2019 from: https://www.ca-ilg.org/sites/main/files/file-attachments/Municipal_GHG_Inventory_Guidebook.pdf.

[24] EPA Center for Corporate Climate Leadership. (2017). *Guide to Greenhouse Gas Management for Small Business and Low Emitters.* Retrieved December 2019 from: https://www.epa.gov/sites/production/files/2017-01/documents/guide_to_greenhouse_gas_management_for_small_business_low_emitters.pdf.

a) Determine appropriate allocation factors and assign to sources.

b) Sort over time.

c) Sort by type of emissions: Fuel, electricity, natural gas, etc.

d) Calculate emissions by assigning correct emissions factor to emissions type (depends on fuel and energy mix from utilities).

5) Analyze data: Identify the largest sources/types, trends, and existing conditions.

This analysis will be completed by early June 2020 and will serve as a direct information source for subsequent mitigation strategy development. The GHG inventory and mitigation strategies should analyze Port operations quantitatively and the customers and downstream effects qualitatively.

There are various software tools (ICLEI tool), protocols (e.g., Greenhouse Gas Protocol), and templates produced by both the public and private sector supporting GHG inventory research. The appropriate tool will largely be determined by the type and extent of data available.

Vulnerability Assessment

A vulnerability assessment is another tool that can be valuable to an organization in the process of trying to estimate risks and plan for the effects of climate change. While the GHG inventory helps to inform mitigation strategies, a vulnerability assessment informs the goals and strategies associated with adapting to the effects of climate change. It can help identify areas of concern and allows planners to prioritize those assets most at risk. This analysis can focus on the Port's hard infrastructure and built environment, or may also include natural systems including water and coastal resources, forests, fish, and wildlife; different social systems topics such as human health, emergency services, and cultural resources; and key built systems associated with land use, transportation and utilities. The vulnerability assessment can both identify (1) the sensitivity of a system (the degree or severity which built, natural, or human systems are affected by climate change impacts) and (2) the capacity of a system to adapt to climate changes with minimal potential damage or cost.[25]

This analysis begins in late April 2020 and relies on collaboration with Port staff on data gathering and to assess the level of detail available and desired in the analysis. The vulnerability assessment should focus on Port properties.

The key steps for completing a vulnerability assessment include:

1. Identify a list of assets similar to Exhibit 7 to include in the assessment.
2. Determine if they are *likely* to be vulnerable to the effects of climate change.

[25] Water Resources Division Lummi Natural Resources Department. (2016). *Lummi Nation Climate Change Mitigation and Adaptation Plan: 2016-2026.*

3. Identify potential impacts of climate change to the asset (e.g., flooding from storm surge, ocean acidification impacting shellfish, transportation service interruptions).
4. Determine the sensitivity level of an asset to climate change.
5. Describe the adaptive capacity.
6. Output: A determination based on the sensitivity and adaptive capacity level of vulnerability.

Exhibit 7: Examples of Port Assets

Physical (Built)	Natural	Human	Social
• Roads, Parking • Fleet vehicles • Airport • Ferries, Boats • Boat ramps, docks • Bellingham Cruise Terminal, Squalicum Harbor and Blaine Harbor • Real estate, businesses • Other facilities • Waterfront park recreation facilities	• Fish stocks • Ocean/Bay • Shellfish • Water resources • Wildlife • Undeveloped public land	• Staff • Human health	• Emergency services • Cultural resources

The Vulnerability Assessment will be completed by the end of June 2020 and will directly inform the Adaptation Strategies.

Mitigation Strategy

Mitigation strategies address the Port's contributions to climate change by establishing short and long-term reduction targets and then identifying strategies (actions), plans, and projects to meet those targets. Milestones, metrics, and benchmarks help measure performance towards targets and are also useful for creating meaningful mitigation strategies. Much of this process rests on a solid understanding of current Port operations and emissions, as that will inform what emissions sources are more easily targeted for mitigation.

Key steps for developing these strategies include:

1. Assessing the universe of potential opportunities to meet short- and long-term goals, as indicated in the greenhouse gas inventory and informed by the goals of the Plan.
2. Determining a set of potential strategies, examples included below in Exhibit 8.
3. Evaluating achievability, weighing the probability of completion against the opportunity presented by the project, or other comparisons of the benefits and the costs of action.

Exhibit 8: Potential Mitigation Strategies

Immediate Strategies	Long Term Strategies
Carbon offsets (investments, buying forests/land for conservation, wetland/estuary restoration)	Switching to/investing in renewable energy infrastructure
Transportation substitution: more public transit, encouraging walking and biking	Aviation biofuels and electrification
Improve energy efficiency	Fleet conversion to electric (trucks, buses, etc.)
Establish a decision-making process for future projects that incorporates mitigation goals	Alternative fuel and electric vehicle infrastructure

This task begins in early June 2020, and should be finished by early August 2020 and will identify the key steps the Port will take to reduce emissions.

Adaptation Strategy

Even if the Port's greenhouse gas emissions drop significantly, it will still need to adapt due to the worsened conditions already set in motion on the global scale. Most of the US coast is highly vulnerable to even small increments in sea-level, especially when considering the dense clustering of large populations punctuating coastlines. Sea-level increases at a rate of 0.07 inches have been recorded over the last century with rises occurring from the addition of fresh water draining from melting glaciers and the warming of water causing thermal expansion.[26] Communities are adapting through a variety of measures such as planting and restoring forests and coastal wetlands, requiring sturdier construction standards and larger shoreline setbacks for new buildings, and more stringent floodplain mitigation. Various adaptation strategies help minimize and avoid climate change impacts.

Key steps for developing these strategies include:

1. Assessing what should be included for adaptation consideration (determine whether the focus should be on adapting infrastructure and emergency preparedness) to meet short- and long-term goals, as indicated in the vulnerability assessment and informed by the goals of the Plan.
2. Determine a set of potential strategies based on best practices and literature review.
3. Analyze the relative benefits compared to cost and achievability, weighing the probability of completion against the opportunity presented by the project.

An adaptation strategy often includes immediate near-term adjustments to reduce threats and a long-term strategy helpful for delineating future measures. A wide variety of adaptation planning approaches offer tools for assessing vulnerability to better anticipate and plan for

[26] NS Hack et al. (2013). Local Planning: Contemporary Principles and Practice 1st Edition.

adaptations.[27] Those knowledgeable about Port emergency planning could be approached to gain a better understanding of preparedness in place and underway.

This task begins in early July 2020, should be finished by early September 2020, and will serve as a decision tool to help the Port make ongoing capital investment decisions.

3.5. Conclusion

This report represents a "Roadmap" to develop a Climate Action Plan for the Port of Bellingham (Port) that will identify actions that mitigate the Port's contributions to climate change and help it adapt to the impacts likely to affect the Port as the climate changes. The comprehensive Climate Action Plan will leverage the Port's ongoing sustainability efforts, help inform Commission decisions, set climate related goals, and identify strategies to meet those goals. This Roadmap provides context, presents preliminary background information, and offers overarching direction on the process, scope, potential outcomes, and critical decision points for developing the Climate Action Plan in 2020. Ultimately, the purpose of this roadmap is to offer guidance for how the Port of Bellingham can successfully navigate climate change planning challenges successfully and develop a meaningful plan of action effective at improving the resiliency of the Port.

[27] US EPA. (2019). Planning for Climate Change Adaptation. Retrieved December 2019 from: https://www.epa.gov/arc-x/planning-climate-change-adaptation

Appendix A: Planning Questionnaire

Port of Bellingham, Delivered 11-29-2019

Introduction

Thank you for your help. The main purpose of this interview/survey is to learn from you about how we can layout a "roadmap" for developing a Port of Bellingham Climate Action Plan in a way that best meets the Port of Bellingham's needs. Your help is important since it guides us towards planning something relevant, useful, and targeted for the Port of Bellingham. Your participation is voluntary, and you can answer any or all the questions. We will summarize responses and not identify them with you personally.

Thanks again for your input. Please contact Jennifer Cannon at cannon@econw.com or 206-388-008 if you have any questions.

Discussion Questions
1. Please describe your role at the Port of Bellingham.
2. Are you concerned about the effects of climate change at the Port of Bellingham? *[If yes, please answer the questions below.]* a. What are the top climate change challenges currently facing the Port? *In other words, what do you worry about occurring today and during the next few years? (Short-term, up to 1-2 years)* b. What challenges do you worry about emerging in the future? *(Middle-long-term, 2+ years from now)*
3. Thinking of this topic, are there strengths, opportunities, and resources at the Port that should be recognized for climate action planning?
4. Overall, what are your thoughts about the focus or scope of a Port Climate Action Plan? What do you expect the plan to look at? *The scope is the boundaries defining the extent of plans. Some plans include energy efficiency, transportation, renewable energy, green building, and land-use mitigation targets and measures to reduce vulnerabilities, etc.*

5. What mitigation goals are important to recognize early on for climate action planning at the Port? (*Mitigation refers to preventing or lessening the severity of the Port's contribution to climate change. Often mitigation focuses on reducing GHG emissions and carbon sequestration - a natural or artificial process where carbon dioxide is removed from the atmosphere (e.g. forests) and held in a solid or liquid form.)*

a. What should these mitigation goals accomplish or achieve? How far should they reach? *(Referring to performance measures. Examples: carbon neutral by a certain year, target on-site emissions, target off-site mitigation such as forest preservation)*

6. What preliminary adaptation goals are important to recognize for climate action planning at the Port? *(Adaptation refers to adjustments in response to the expected climate change effects such as extreme weather.)*

a. What set of climate action costs should be included in adaptation goals? (*For example, should the analysis be limited to Port owned infrastructure or should it include changes to the market value of Port owned properties or impacts to Port businesses?)*

b. Do you have anything in mind about what adaptation goals should accomplish or achieve? *(Referring to performance measures. Examples: Applying building codes that would adapt to future climate conditions and extreme weather, adding flood control infrastructure, enhancing emergency preparedness, reduce water use, etc.)*

7. Who are the core stakeholder groups (interests) that should be involved in climate action planning at the Port and what should their role be in the planning process? *(Examples: education/provide input, part of a working group providing suggestions, part of a steering committee working out decisions)*

8. Who are the core stakeholder groups (interests) that should be involved in climate action planning at the Port and what should their role be in the planning process? *(Examples: education/provide input, part of a working group providing suggestions, part of a steering committee working out decisions)*

9. How do Port stakeholders like to participate or get involved? *(Examples: Interviews, surveys, focus groups, educational presentations or panels, open houses, smaller interactive workshops, training, etc.*

10. What are the most useful methods for sharing information with stakeholders? (*Examples: written materials, email, in-person conversations, social media, presentations to groups*)

11. Do you have any strategies in mind that should be explored for how decisions are made on the development of a climate action plan? Do you have examples of what has worked well in the past?

12. How would you like to be involved? Circle preferred option below or write preference.

a. Highly Involved: Problem-solving with other stakeholders and providing review and regular involvement. "I will dedicate time to this process because of its importance." "I could be involved often." " I will act as a project ambassador."

b. Input/Feedback with more periodic participation: "Interested in occasional participation." "I could spread awareness for this effort."

c. Communications/Outreach: Receive periodic updates through reports and/or email. "I want to give my two cents when I can."

d. Other_____

13. Is there anything else you would like to share?

14. Please provide your name and email.

Next Steps

After gaining responses, we will summarize what we learned and report results.
Thank you for your help!

Appendix B: Questionnaire Results Summary

Challenges and Concerns

Short term:

- Storm intensity and flooding
- Forest fire
- Emergency management
- Shoreline damage to land and infrastructure

Long term:

- Level of preparedness for sea-level rise
- Ocean acidification
- Impact on salmon and other marine species
- Impact on the fishing industry, agriculture, marine trade and shipping

Strengths and Opportunities

- Staff knowledge and experience
- Openminded leadership and flexibility as an institution
- Collaboration with regional plans and entities, and to integrate with existing Port plans
- Leader for other ports

Scope

There was general agreement that all elements of the Port operations should be included in development of the Plan and should fall under the requirements of the Plan. Specific emphasis was placed on:

- Green building standards
- Energy use and efficiency
- Setting specific emissions reduction targets
- Transportation
- Land management, land use

Mitigation and Adaptation Goals

Mitigation goals:

- Waste reduction
- Energy efficiency
- Natural hazard mitigation
- Carbon neutrality goal by 2040/50

Adaptation goals:

- SLR, flood resiliency preparation
- Investing in building infrastructure (resilience and green energy)
- Waterfront infrastructure improvements
- Vulnerability assessment to identify the largest risks

- Being prepared for changes to the industry

Considered Costs

- Costs to fishing industry (of changing fish stocks, of fuel requirements, etc.)
- Changing the market value of real estate portfolio
- Costs for Port infrastructure and Port owned land
- Cost of doing nothing

Participation and Information Sharing

- Most wanted high to moderate involvement
- Presentations, interactive work/focus groups, updates to the commission
- No big public process- designated opportunities for the public to give feedback

Appendix C: Ports of Washington

Ports with Climate Action Plans have an asterisk *.

- Port of Allyn
- Port of Anacortes
- Port of Benton
- Port of Bremerton
- Port of Brownsville
- Port of Camas-Washougal
- Port of Centralia
- Port of Chehalis
- Port of Chelan County
- Port of Chinook
- Port of Clarkston
- Port of Columbia
- Port of Coupeville
- Port of Dewatto
- Port of Douglas County
- Port of Edmonds
- Port of Ephrata
- Port of Everett
- Port of Grandview
- Port of Grapeview
- Port of Garfield
- Port of Grays Harbor
- Port of Hoodsport
- Port of Illahee
- Port of Ilwaco
- Port of Indianola
- Port of Kalama
- Port of Kennewick
- Port of Keyport
- Port of Kingston
- Port of Klickitat
- Port of Longview
- Port of Lopez
- Port of Manchester
- Port of Mattawa
- Port of Moses Lake
- **Port of Olympia***
- Port of Orcas
- Port of Othello
- Port of Pasco
- Port of Pend Oreille
- Port of Peninsula
- **Port of Port Angeles***
- Port of Port Townsend
- Port of Poulsbo
- Port of Quincy
- Port of Ridgefield
- Port of Royal Slope
- **Port of Seattle***
- Port of Shelton
- Port of Silverdale
- Port of Skagit
- Port of Skamania
- Port of South Whidbey
- Port of Sunnyside
- Port of Tacoma
- Port of Tracyton
- **Port of Vancouver***
- Port of Wahkiakum district 1 and 2
- Port of Walla Walla
- Port of Warden
- Port of Waterman
- Port of Whitman County
- Port of Willapa Harbor
- Port of Woodland

Note: The ports listed above were cited by the Washington Public Ports Association (WPPA). Some ports could be missing from the above list due to incomplete information. The WPPA cites 75 ports in total. Source: The Washington Public Ports Association. (2019). Retrieved December 2019 from: https://www.washingtonports.org/.