

Project Memo

To Susan Clark (City of Olympia) Page 1

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Subject **DRAFT Sea Level Rise Planning Framework**

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Date September 21, 2017

The purpose of this document is to present the overall planning framework for developing a Sea Level Rise (SLR) Response Plan for the City of Olympia, LOTT Clean Water Alliance (LOTT), and Port of Olympia (Port). The SLR planning framework outlines the SLR adaptation planning process and defines the vision, purpose, and guiding principles for the plan. This document includes the following sections:

1. Project Overview
2. SLR Response Plan Assumptions
3. Proposed Approach to SLR Adaptation Planning
4. Regulatory Framework and Considerations
5. Community Engagement

1. Project Overview

Project Rationale

Downtown Olympia is a regional hub for economic and social activity, with important cultural and business assets and historic buildings. Downtown also has critical infrastructure that serves the region, such as the Port and LOTT Budd Inlet Treatment Plant (BITP). Both public and private entities have made significant investments in the Downtown area over the past several decades and even more growth is anticipated in the future as the Downtown area is projected to absorb 25 percent of the city's population growth in the next 20 years. The City would like to ensure that Downtown continues to prosper and serve the residents and businesses of Olympia and the greater region for decades to come.

[Suggested figures: Photo of active downtown scene; photo of Port and/or BITP]

Given Olympia's location on Budd Inlet at the southern end of Puget Sound, it has been subject to flooding in the past as the confluence of high water levels in Capitol Lake and high tides in Budd Inlet can cause water to spill into downtown streets, such as during the storms of March 2016 and December 2015. As the climate warms due to human emissions of greenhouse gasses and sea levels rise as result, flooding is anticipated to become more frequent and severe if no action is taken. As coastal waters rise, the frequency and magnitude of flooding from coastal storm events will

increase as SLR increases the base water level upon which storm surge and waves act. Downtown is particularly vulnerable as much of the peninsula is built on fill, shoreline areas are mapped within FEMA's 100-year coastal floodplain, and high tides can back up into the stormwater system and cause surface street flooding. Furthermore, Olympia also has to contend with subsidence, meaning that ground elevations are sinking and Olympia will experience SLR impacts sooner than other areas.

[Suggested figure: Photo of flooding from March 2016 or December 2015]

More frequent flooding could reduce the quality of life in Olympia, reduce access to downtown, cause businesses to close more often, damage buildings, and deteriorate and/or severely damage critical infrastructure. Proactively adapting to SLR can help avoid these disruptions and damages thereby reducing costs in the long-term. Creating a SLR Response Plan ensures that agencies, stakeholders, and other key players are coordinated and working together to maximize the limited resources available to adapt. The SLR Response Plan will analyze options for protecting the downtown area, develop recommendations, provide implementation schedules, identify decision-making thresholds, and assess funding needs and potential sources to address SLR vulnerabilities and risks in the future.

Vision Statement:

The Olympia SLR Response Plan will be a formal community plan that prioritizes strategies and investments for best responding to SLR, while protecting downtown's economic, social and environment values.

Purpose:

The purpose of the SLR Response Plan is to:

- Develop an actionable plan to protect downtown from sea level rise within the planning horizon
- Understand vulnerabilities, costs and the implications of taking no action
- Identify priority sea level rise response actions and implementation timelines
- Estimate costs of actions and identify resources needed for implementation
- Promote an understanding of the shared responsibilities between public, private and community interests in adapting to sea level rise
- Identify responsibilities for City / Port / LOTT and other stakeholders

Principles

The following principles will guide the SLR response planning process:

- **Science:** Incorporate best available science and lessons learned from other coastal communities to inform plan development.
- **Adaptable Plan:** Develop the plan as a living document, expecting that assumptions, approaches and timelines should be adapted over time based on best available science.

- **Public Involvement:** Engage community partners and stakeholders using an open and transparent process that incorporates community input.
- **Protection:** Protect the social, historic, and economic heart of the City.
- **Essential Infrastructure:** Provide for the continued operation of essential public infrastructure, including LOTT's BITP and the Port's Marine Terminal, Swantown Marina, and Boatworks.
- **Multiple Benefits/Innovation:** Prioritize innovative, inter-disciplinary solutions that increase resilience to SLR while providing multiple community and environmental benefits.
- **Coordination:** Coordinate with and support other initiatives such as the City of Olympia Downtown Strategy and Thurston County Regional Council Climate Adaptation Plan.

Roles

In the development of the SLR Response Plan, the following key stakeholders will take on the following roles:

- **City / LOTT / Port:** These agencies will lead the development of the plan. They will be responsible for keeping the planning process on schedule, managing the consultant team, coordinating public outreach and stakeholder engagement, and disseminating the SLR Response Plan.
- **City Departments / LOTT / Port Staff:** These departments and staff will serve as technical contributors, providing information on City-owned and managed assets, providing feedback on the analysis and contributing and reviewing ideas for adaptation strategies.
- **Elected Officials** (i.e. City Council, Port Commission, LOTT Board of Directors): These bodies are responsible for approving the SLR Response Plan. They will be provided with updates at key junctures and their feedback will be incorporated into the plan.
- **Community Partners and Stakeholders:** Community members will be invited to provide input to the development of the plan through a series of public workshops, further described in Section 5.

2. SLR Response Plan Assumptions

The SLR Response Plan will be developed to be consistent with the following plan assumptions:

- Project Area:** The project area includes the downtown peninsula (including Port of Olympia and Budd Inlet Treatment Plant) from the eastern shoreline of the 4th Avenue Bridge in West Bay to the intersection of East Bay Drive and Olympia Avenue in East Bay, also including the Capital Lake shoreline along Heritage Park (Figure 1).



Figure 1. SLR Response Plan Project Area

- Risk Tolerance/Storm Event:** Given downtown’s social and economic importance and extensive public and private infrastructure, Olympia has a low risk tolerance for SLR. Nevertheless, the level of risk tolerance may be different for various assets depending on factors such as asset lifespan, criticality, and adaptive capacity.
- SLR Scenario:** Given upward evolving SLR projections, the long planning horizon, and downtown’s low risk tolerance, it is deemed appropriate to use a high-range (lower-probability, higher impact) SLR projection scenario for Puget Sound with local adjustments for Olympia (Figure 2).

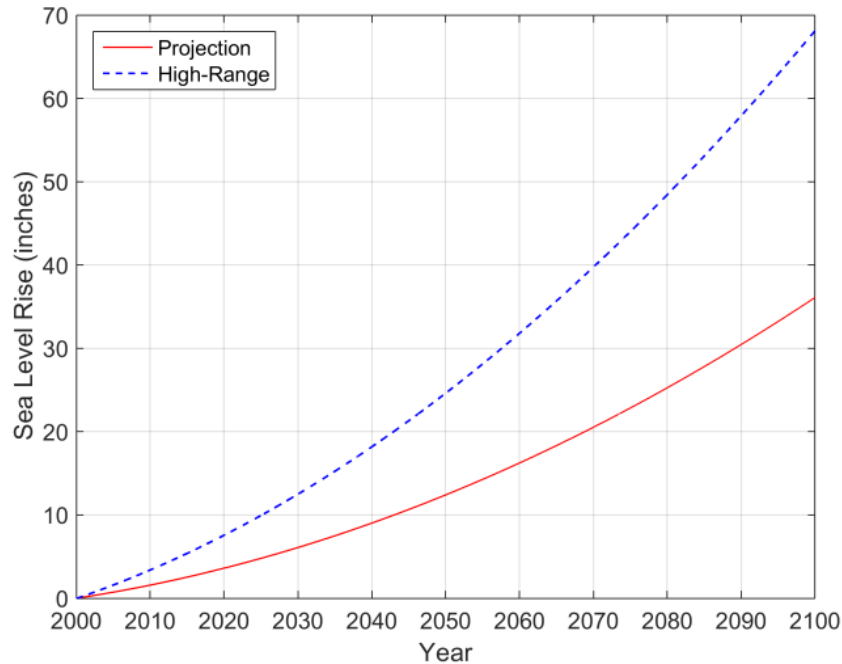


Figure 2. SLR Projections at Olympia

- **Subsidence Rate:** Until further studies are performed specific to Olympia, the Plan should assume a land subsidence rate of 2 millimeters per year.
- **Incremental Planning:** This SLR response planning process represents the necessary first incremental step to addressing SLR for the community. It is not the last step. As such, the plan will not provide detailed costs or confirmed funding sources.
- **Capitol Lake:** The Plan will be developed to be adaptable to future decisions made by Washington State about the long-term management of Capitol Lake.
- **Downtown Strategy:** The SLR response planning process and resulting plan will build upon and be consistent with the vision, goals and recommended actions of the Downtown Strategy which was developed through an extensive public process.
- **No-action Alternative:** The Risk and Vulnerability Assessment will evaluate at a high level the consequences of a no-action alternative.
- **Retreat Strategy:** A retreat strategy and associated costs are not within the scope of work of this project.
- **Climate Change Mitigation:** Climate change (greenhouse gas) mitigation is outside the scope of this project. Nevertheless, adaptation strategies that also meet greenhouse gas mitigation goals will also be considered in the strategy evaluation phase.

3. Proposed Approach to SLR Adaptation Planning

The SLR adaptation planning process follows a seven-step process, summarized in Figure 3. Stakeholder engagement is on-going and critical to each step.

The SLR Response Plan will address the first five steps in the adaptation planning process, as well as stakeholder engagement, described in Section 5. Following development of the SLR Response Plan, the City, LOTT, and Port will be well positioned to begin the implementation and monitoring phases of the planning process. The sections that follow describe each step in the planning process and provide additional detail regarding how each step will be carried out to develop Olympia’s SLR Response Plan.

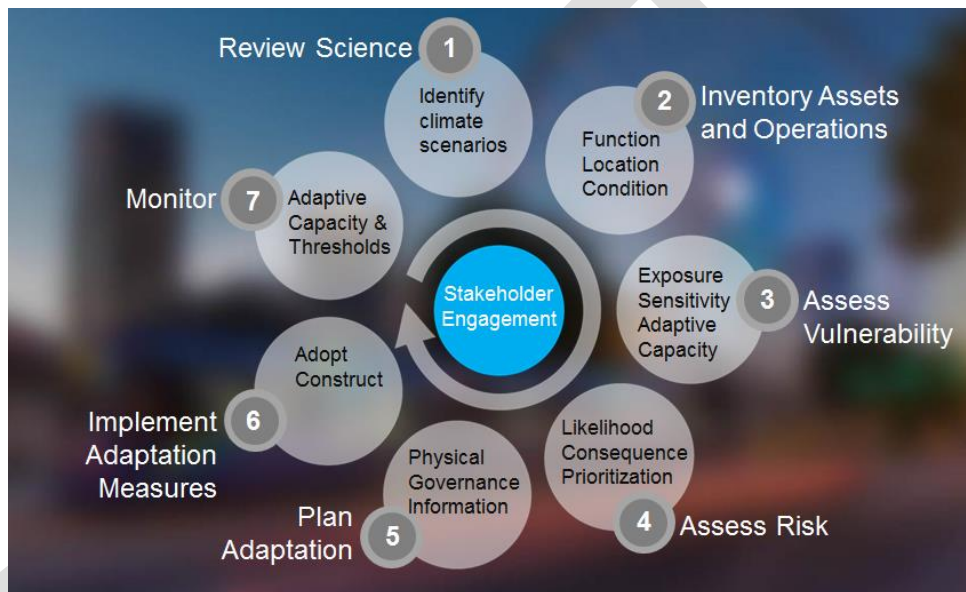


Figure 3: SLR Adaptation Planning Process

Step 1: Review Science

Selecting the most reliable climate science requires drawing on local, regional, and national expertise. Over time, adaptation efforts will need to accommodate new science, information, and conditions.

Olympia Approach: The Olympia SLR Response Plan includes a climate science review that takes into account the best available science on sea level rise, coastal flooding, and precipitation to establish a scientific basis for evaluating climate change impacts to Olympia.

- *Timeline: July – August 2017*

Step 2: Inventory Assets and Operations

The climate adaptation process requires an understanding of the key assets and operations that are critical to the functioning of a community. The asset and operations inventory identifies critical infrastructure, key habitat resources, and other assets of value to the community.

Olympia Approach: The project team will distribute a questionnaire to each City department, LOTT, and the Port to better understand the critical assets and functions of each organization. This information will feed into the vulnerability and risk assessment and focus efforts on the most important assets and community services.

- *Timeline: August – September 2017*

Step 3: Assess Vulnerability

SLR vulnerability assessments describe the impacts that would be experienced by an asset due to temporary flooding or permanent inundation from coastal waters. Impacts may include physical damage, disruption to systems or services, and/or displacement of residents or businesses. Vulnerability assessments follow a standardized step-by-step approach, which is illustrated in Figure 4.

- **Exposure:** Provides information on flood timing and pathways of flooding.
- **Sensitivity:** Provides information on the degree to which the condition or functionality of an asset is affected by flooding.
- **Adaptive Capacity:** Provides information on an asset's existing resiliency to flood waters or rising sea levels and its ability to cope with impacts.

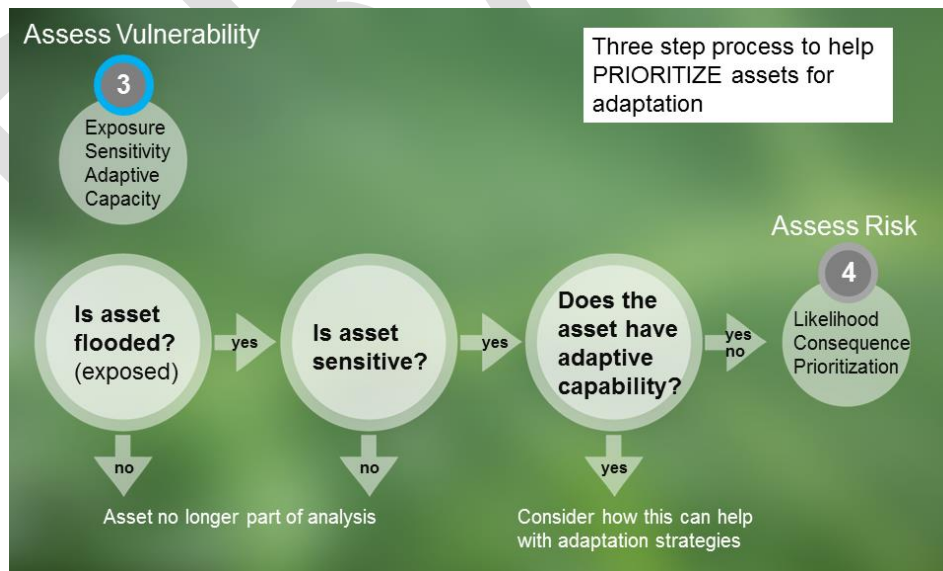


Figure 4: Vulnerability Assessment Process

Assets are considered vulnerable if they are exposed to flooding, have high sensitivity, and low adaptive capacity. Assets found to be vulnerable are prioritized in the risk assessment and adaptation planning phases.

Olympia Approach: A high-level vulnerability assessment will highlight key vulnerabilities of these assets based on exposure, sensitivity, and adaptive capacity.

- *Timeline: August – November 2017*

Step 4: Assess Risk

Vulnerability assessments are often followed by risk assessments, which describe (quantitatively or qualitatively) the potential consequences that could occur due to SLR impacts. Types of consequences considered in a risk assessment may include:

- **Critical service consequences:** Temporary or permanent inundation impacts to power, communications, water and wastewater services, medical facilities, and/or lifeline transportation services
- **Social consequences:** Impacts to public health and safety, general displacement and homelessness, and to the provision of social services
- **Economic and financial consequences:** Workforce disruption, loss or damage to real estate, or impacts to tourism or significant industries
- **Environmental consequences:** Deterioration or loss of critical habitats or species and water quality impacts

Olympia Approach: The Olympia SLR Response Plan will include a high-level qualitative risk assessment that considers economic, social, and environmental factors. The findings of the risk assessment will be used to help prioritize and phase adaptation strategies.

- *Timeline: October – November 2017*

Step 5: Plan Adaptation

Once assets have been prioritized for adaptation, comprehensive planning evaluates the best strategies to reduce climate impacts. Adaptation planning is a result of participatory community engagement, and should include those residents and businesses who could be potentially affected by the impacts of SLR, and should, ideally, integrate interdisciplinary problem solving and solution generation. Adapting to the impacts of climate change presents a unique opportunity to proactively address vulnerabilities will developing projects that offer multiple co-benefits to the community.

Olympia Approach: The Olympia SLR Response Plan will develop a comprehensive approach to adaptation for downtown Olympia and its shoreline. In addition to physical infrastructure, adaptation strategies will also relate to governance, informational gaps, operations, and services. An extensive list of initial strategies will be developed through close collaboration between the City, LOTT, and Port staff and the consultant team.

Strategies will be evaluated across the following categories of evaluation criteria and considerations:

- *Technical effectiveness – how well does the strategy achieve its intended purpose?*
- *Financial – how cost effective is the strategy?*
- *Socio-economic – does the strategy have social, cultural, or historical preservation co-benefits or impacts?*
- *Environmental – does the strategy have environmental co-benefits or impacts?*
- *Administrative – does the strategy have oversight or regulatory opportunities or constraints?*

From the menu of strategies, subsets of strategies will be selected to create distinct adaptation scenarios for downtown Olympia that emphasize community values, focuses, and tradeoffs. The adaptation scenarios will be shared with community members to solicit their feedback. Based on community and key stakeholder feedback, a preferred adaptation plan will be developed.

- *Timeline: December 2017 – May 2018*

Step 6: Implement Adaptation Measures

Implementation of some types of strategies can start immediately, such as policy changes to address SLR. Longer-term and larger-scale interventions which are identified, prioritized, and designed as part of a comprehensive SLR Adaptation Plan can be phased over time, as better information, funding, and/or partnerships are identified.

Olympia Approach: The SLR Response Plan will identify comprehensive city-wide actions as well as specific LOTT and Port actions, including how to incorporate adaptation strategies into City, LOTT, and Port planning and budgeting processes. The plan will clearly identify the actions that are applicable to each project partner and their respective assets. The plan will also include a discussion of next steps for implementation, including any additional studies needed, such as design and engineering, regulatory permits, and funding needs.

- *Timeline: 2019 – beyond*

Step 7: Monitor Adaptation

Monitoring is a critical and ongoing component of any successful adaptation effort. Monitoring provides an understanding of which actions are most effective; highlights unintended consequences; and identifies new data, which may indicate a need to change direction or implement additional strategies. Effective adaptation plans will include the types and timeframe of monitoring to be conducted, and any thresholds that would trigger new actions, reporting requirements, and responsible parties.

Olympia Approach: The plan will include decision-making thresholds that will be monitored over time. In addition, the Project team will continue to collaborate with the University of Washington Climate Impacts Groups to monitor the latest climate science and trends.

- *Timeline: 2019 – beyond*

INSERT OVERALL TIMELINE GRAPHIC, something similar to:



4. Regulatory Framework

This section provides a brief overview of the regulatory context that will inform the development and implementation of adaptation strategies. It identifies major public land owners in the SLR planning area and includes information on agencies that play a key regulatory role along the Olympia shoreline and efforts in the downtown area with which coordination will be crucial.

Public Land Ownership

As shown in Figure 6, the Port, LOTT, and City own a significant portion of land in the SLR planning area; however, some portions of the planning area are privately owned. Washington State, Thurston County, and Intercity Transit also own land in the area and will participate in the planning process. Adaptation strategies along the waterfront will require careful coordination and collaboration with all affected landowners.

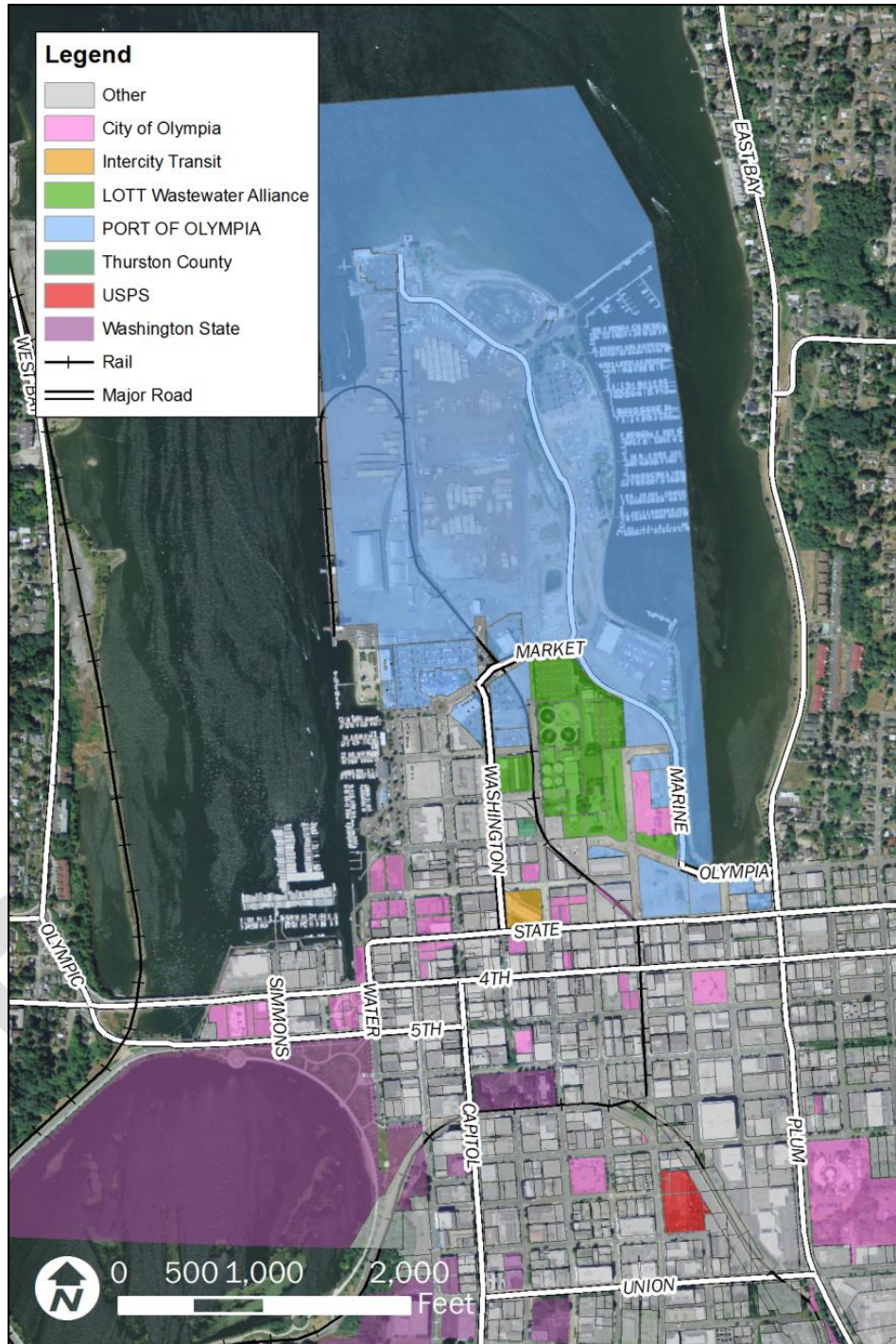


Figure 6: Land Ownership in SLR Planning Area

Agencies

Effective SLR adaptation will require coordination with agencies with jurisdiction along the shoreline and compliance with local, state, and federal regulations. Over a dozen agencies, often having overlapping regulatory authority, play a role in managing Olympia's shoreline assets. A lack of unified and coordinated regulatory oversight can lead to complications and delay of project goals. To establish effective and proactive SLR adaptation for the City of Olympia, participation of the agencies discussed below may be required:

Federal

Coastal or SLR-related projects may need authorization from the following federal agencies:

- **U.S. Army Corps of Engineers (USACE):** issues permits and authorizations for various environmental impacts and supports levee certification decisions for the National Flood Insurance Program (NFIP).
- **Federal Emergency Management Agency (FEMA):** issues Flood Insurance Rate Maps (FIRM) and administers the NFIP. Olympia is a participant in FEMA's NFIP. Portions of Olympia's downtown peninsula fall within FEMA's Special Flood Hazard Area.
- **U.S. Fish and Wildlife Service (USFWS):** has regulatory jurisdiction over impacts to terrestrial and freshwater species protected under the Endangered Species Act. In addition, USFWS issues permits under the Bald and Golden Eagle Protection Act (not anticipated to be applicable).
- **National Marine Fisheries Service (NMFS):** has regulatory jurisdiction over impacts to marine species protected under the Endangered Species Act. In addition, NMFS administers permits for incidental harassment or take under the Marine Mammal Protection Act

State of Washington

The following State agencies have developed guidance, policies, or programs related to SLR and/or issue permits for SLR-related projects:

- **Washington State Department of Ecology (WDOE):** issues water quality certifications and construction stormwater permits, manages and approves the Shoreline Master Program; led the development of the State's climate change response strategy. WDOE also provides Coastal Zone Management Act consistency certification.
- **Puget Sound Partnership:** leads the region's efforts to restore and protect Puget Sound.
- **Washington State Department of Fish and Wildlife (WDFW):** issues Hydraulic Project Approvals for work within "Waters of the State."
- **Washington State Department of Natural Resources (WDNR):** manages aquatic lands within Puget Sound. Work on land managed by WDNR requires Aquatic Use Authorizations or Leases.
- **Department of Enterprise Services:** owns and maintains Capitol Lake and dam

- **Washington State Department of Archaeology and Historic Preservation (DAHP):** issues permits for alteration to an archaeological site or historic resource. USACE also coordinates and consults with DAHP before issuing permits.

Local

Coastal or SLR-related projects may need authorization from the following organizations:

- **Olympia Planning and Building Department:** Most construction projects in Olympia will require permits in order to ensure they meet local, state, and national building and safety regulations. In addition, certain types of projects must also first go through a Land Use (Site Plan) review process. In coordination with the Planning Commission, the department oversees compliance with the Comprehensive Plan and Downtown Strategy. This department would also likely be the lead for State Environmental Policy Act (SEPA) compliance.
- **Port of Olympia:** The Port of Olympia Commission passes a Comprehensive Scheme of Harbor Improvements. This is the Port's primary planning document and is required by state law. All projects contained in the Capital Investment Plan (CIP) must first be contemplated in the Comprehensive Scheme of Harbor Improvements.
- **City of Olympia Public Works:** The Water Resources Department manages drinking water, wastewater, and stormwater. The Transportation Department manages the local street network.
- **LOTT Clean Water Alliance:** LOTT provides wastewater management services for the urban area of north Thurston County, including Lacey, Olympia, and Tumwater. LOTT maintains and operates the BITP, located within the downtown peninsula. Wastewater system improvement projects will need to be integrated into LOTT's CIP.

Existing Regulations and Policies

- **Shoreline Master Program (SMP):** a set of local policies and regulations adopted by the City under the State's Shoreline Management Act that generally applies to all major water bodies and lands within 200 feet of those waters. Olympia's SMP was approved in 2015 after a seven-year process with extensive public participation.
- **2010 Sea Level Rise Policy:** Olympia adopted a policy describing its commitment to protect Downtown from the impacts of SLR, seek to understand the implications of potential 100-year sea rise of 50 inches, incorporate adaptation and flexibility into both public and private infrastructure projects, and seek opportunities to maintain control of valuable shoreline.
- **2014 Comprehensive Plan:** The Comprehensive Plan describes the community's long-term vision and goals, which guide City budgets, master plan, development regulations, and other decisions.
- **Olympia Municipal Code:** The City's Flood Damage Prevention (16.70) and SLR Flood Damage Reduction (16.80) ordinances set development standards in areas exposed to flooding under current and future conditions (with SLR).

- **Port of Olympia Comprehensive Scheme of Harbor Improvements and Development Guidelines:** Required by state law, these documents include descriptions of the Port's Use Districts, anticipated future projects, and design standards for properties.

Coordination

Local Efforts

The SLR Response Plan will coordinate implementation with the following efforts:

- **Downtown Strategy:** Completed in 2017, this plan envisions downtown being a more vibrant and attractive place to live, work, and play. It identifies community priorities, outlines actions for the next five years, and guides City budget, work plans, and partnership development.
- **The Capital Facilities Plan:** This is the mechanism by which the City schedules the timing, location, projected cost, and revenue sources for capital improvements.
- **Comprehensive Emergency Management Plan:** An all-hazard approach to planning, coordinating, responding and recovering from emergencies or disasters within the city, including in Downtown.
- **Park Master Plan:** This plan identifies the locations of future parks and open space, and includes a capital investment strategy for improvements.
- **Transportation Plans:** There are a variety of transportation plans that currently guide investments and streetscape requirements.
- **Utility Master Plans:** The City owns and operates four utilities (water, waste, wastewater, storm & surface water), and has a master plan for each to ensure that utility services can be provided and maintained for existing and future planned land uses and populations.
- **Budd Inlet Treatment Plant Master Plan:** Completed in 2006, this plan is designed to ensure efficiency of plant operations, anticipated new levels of treatment regulation, and consider what will be necessary to achieve continued sustainability in a high profile, high-cost urban re-development area.

Regional Efforts

- **Thurston Climate Adaptation Plan:** Thurston Regional Planning Council is developing a watershed-based plan with adaptation actions that region's public and private sector stakeholders could take to reduce, prepare for, and cope with projected climate change impacts in the decades ahead.
- **Sustainable Thurston:** *Creating Places – Preserving Spaces: A Sustainable Development Plan for the Thurston Region* aims to integrate sustainable into all regional decision-making to achieve a healthy economy, society, and environment.
- **University of Washington Climate Impacts Group:** Supports the development of climate resilience by advancing understanding and awareness of climate risks and working closely with public and private entities to apply this information.

- **Floodplains by Design:** A public-private partnership led by Puget Sound Partnership, the Nature Conservancy, and Washington State Department of Ecology seeks to change the way we think about floodplains and put collaboration first.
- **Washington Coastal Hazards Resilience Network:** A network of hazards and climate change practitioners from federal and state government agencies, Tribes, academic institutions, consulting firms, and non-profit organizations that seeks to improve regional coordination, integration, and understand of coastal hazards and climate change impacts.

5. Community Engagement

The City, LOTT, and Port are currently developing a community engagement plan that will include multiple opportunities and venues for the public to provide input to the plan. Three community workshops will take place over the course of the SLR response planning process. Preliminary topics for each workshop are summarized below:

- **Community workshop #1:** During this workshop, the planning assumptions, results of the vulnerability assessment, and potential response actions and strategies will be shared and feedback on potential solutions will be gathered. The workshop will include a presentation, Q&A session, and Open House stations, gathering feedback in a variety of ways – from the group, one-on-one conversations, and comment sheets.
- **Community workshop #2:** During this workshop, initial adaptation scenarios focused on different values will be presented. The public will be asked to provide feedback on the preferred adaptation scenario features and strategies.
- **Community workshop #3:** The proposed comprehensive adaptation plan for downtown Olympia will be presented. The public will be asked to provide feedback on the plan's features and strategies.