



CHAPTER 8— COST OF ADAPTATION

COST OF ADAPTATION

The sections that follow present estimated costs to implement the physical adaptation strategies described in this Plan and discuss potential funding and financing sources to fund implementation.

COST TO PROTECT OLYMPIA

The costs to protect downtown Olympia from flooding and sea level rise will be substantial; however, the cost of inaction will be far greater. Costs to implement the strategies identified in the Plan will be spread out over many decades and shared by the Project Partners and our community. High level costs for the physical strategies presented in Chapter 6 are provided in Table 9. The costs are presented by focus area. A detailed breakdown of costs for individual strategies within each focus area is provided in Chapter 9. Costs are provided in 2018 dollars and have not been escalated to future dollars.

IMPORTANCE OF PARTNERSHIPS

“Whenever feasible, adaptation planning efforts should be long term, comprehensive, and integrated across entities. Closely coordinating adaptation planning efforts and pooling resources can help to tap into efficiencies of scale and can support the design of multi-function projects that can qualify for a wider range of funding sources.”

Source: Paying for Climate Adaptation in California: A Primer for Practitioners, October 2018, AECOM

Table 9: Estimated Costs of Sea Level Rise Adaptation in Olympia

Area / Strategy	Near-Term (0-5 years) Sea Level Rise: up to 6 inches	Mid-Term (5-30 years) Sea Level Rise: up to 24 inches	Long-term (30+ years) Sea Level Rise: up to 68 inches
Capitol Lake / Lower Deschutes Watershed	\$0.2M	\$3M to \$6M	\$3M to \$118M
Percival Landing and Isthmus	-	\$11M to \$13.5M	\$85M to \$105M
Budd Inlet Treatment Plant	-	\$1 to \$6M	\$12.5M to \$15M
Port of Olympia Peninsula	\$20K	\$0.5M to \$1M	\$8M to \$9.5M
Stormwater System	\$1M	-	\$82.5M to \$100.5M
Total	\$1.25M	\$16M to \$26M	\$190M to \$350M

Costs represent a preliminary opinion of probable costs to construct the identified physical sea level rise adaptations strategies. Costs include the following components:

- **Direct Costs:** This includes all labor, equipment usage, permanent and temporary materials, erosion / water pollution control, and spill prevention plans
- **Mobilization:** Part of the direct cost and includes cost allowances for mobilization / demobilization to the project site and setup temporary facilities and utilities. This is assumed to be 10% of the direct costs.
- **Contractor's Markup:** This includes costs for site general conditions, job supervision, contractor's office overhead, profit, and bonds. This is assumed to be at 25% of the direct cost.
- **Design Engineering and Permit Fees:** This includes a 15% allowance for the engineering design fee and environmental permitting and clearance requirements
- **Design Contingency:** This includes a 25% allowance for project design development during the design and construction phases of the project as more current and updated information for the project and site conditions are obtained
- **Construction Contingency:** This includes a 10% allowance for changes during the construction phase for possible unforeseen conditions, schedule delays, and project change orders
- **Contract Administration:** This includes a 30% allowance for contract administration and Project Partner staff time to oversee the design, permitting, and construction phases
- **Escalation:** Not included at this time

The estimated costs include many of the physical and operational strategies identified in Chapter 6 with the following exclusions within each focus area:

- **Capitol Lake / Lower Deschutes Watershed:**
 - No exclusions identified
- **Percival Landing and Isthmus:**
 - Acquire waterfront leases if and when they become available
 - Over water boardwalks and buildings
- **Budd Inlet Treatment Plant:**
 - Upsize north outfall pipe
 - Increase flood storage and pumping capacity

- **Port of Olympia Peninsula:**
 - Rebuild and raise marine terminal, shipping berths, and rail
 - Retrofit and rebuild marina docks and gangways
- **Stormwater System:**
 - Stormwater outfall consolidation along Capitol Lake shoreline

In addition, costs do not include environmental mitigation or land acquisition. Land acquisition costs are assumed to be small due to alignment of flood protection strategies within the public right-of-way.

POTENTIAL FUNDING AND FINANCING SOURCES

In Olympia, as in much of the country, existing public finance and governance models do not match the scale required to meet the anticipated needs of sea level rise adaptation. In order to maintain public safety, protection of investments, and business continuity of our downtown during existing and future climate conditions, the Project Partners will be challenged with identifying and accessing capital for project development, such as the adaptation strategies outlined in this Plan.

Various types of funding will need to be pursued. As discussed in the governance strategies section (Chapter 7), the Plan recommends creation of a sea level rise finance group. The finance group would be responsible for developing, investigating, and pursuing funding opportunities for sea level rise adaptation projects. The Project Partners will monitor potential grant opportunities, in addition to funding allocated in annual operating budgets or for capital improvement projects. Currently, there is a range of potential funding

REGIONAL EMERGENCY PLANNING AND FUNDING

The Hazards Mitigation Plan for the Thurston Region provides a general strategy to reduce the risks of the most destructive hazards that threaten the region. It addresses various types of risks including earthquakes, severe storms, flooding, volcanoes, and sea level rise. The Hazards Mitigation Plan serves as a tool to prioritize risks and potentially secure funding for solutions.

opportunities that are provided by federal, State, and local government. Table 10 below highlights several of these programs that support the implementation of climate resilience strategies. However, substantial

additional funds will in all probability be needed. Future State and federal funding could be helpful, but those funding sources lack the high level of certainty necessary for our flood protection work.

Table 10: Potential Funding Sources for Sea Level Rise Adaptation Project Implementation

Federal	State	County	City
U.S. Army Corps of Engineers	Department of Ecology	Flood Control Zone District	- Interlocal Agreements
- Civil Works Program	- Flood Control Assistance Account Program	- Property taxes	- Utility Funds
FEMA	- Floodplains by Design	- Rates and fees	- General Fund
- Pre-Disaster Mitigation Program	- Clean Water State Revolving Fund	- Local Improvement Districts	- Local Improvement Districts
- Flood Mitigation Assistance Program		- General Obligation Bonds	
NOAA			
- Coastal Resilience Grant Program			

Source: FCS Group, *Funding Approaches to Address Sea Level, Issue Paper #1 for City of Olympia (June 2017)*