



## MEMORANDUM

February 2, 2024

**TO:** MEMBERS, PORT COMMISSION  
Hon. Kimberly Brandon, President  
Hon. Gail Gilman, Vice President  
Hon. Willie Adams  
Hon. Ed Harrington  
Hon. Steven Lee

**FROM:** Elaine Forbes  
Executive Director 

**SUBJECT:** Informational presentation on the San Francisco Waterfront Coastal Flood Study Draft Integrated Feasibility Report and Environmental Impact Statement.

**DIRECTOR'S RECOMMENDATION:** Information Only – No Action Required

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### INTRODUCTION

The Port of San Francisco (Port) is engaging in an effort to defend one of the most densely developed and unique urban ports in the State of California against coastal flood risk and sea level rise. The Port's jurisdiction stretches from Heron's head park in the south to Hyde Street pier in the north. Defending the San Francisco waterfront from flooding is a citywide effort that includes a key federal partner, the United States Army Corps of Engineers (USACE). The goal of this work is to prepare for sea level rise while addressing current-day flood and seismic risks.

San Francisco's waterfront faces risks from coastal flooding today which will increase as sea levels rise due to climate change. Parts of San Francisco's waterfront currently flood at high tides and during storms. As climate change causes storms to become more extreme and sea levels to rise, flood risk will increase and affect the entire waterfront, causing damage and adverse impacts to buildings and open spaces, small businesses, light

industry, Port tenants, jobs, historic resources, disaster response facilities, transportation and utility networks, and Port maritime facilities.

USACE and the City of San Francisco (City), with the Port as the lead agency, are working to defend the City and its waterfront from flooding through the San Francisco Flood Study (Flood Study). The Flood Study analyzes coastal flood risk and the effects of sea level rise on the San Francisco waterfront along the Port's 7½ mile jurisdiction over the period through 2140.

In 2018, the Port was awarded a new start authorization (New Start) for USACE to conduct a general investigation of coastal flood risk along the City's Bay waterfront. San Francisco's Congressional delegation, including Speaker Emerita Pelosi, Senator Feinstein, Senator Harris, and Senator Padilla have played a critical role in advancing the Flood Study with USACE. See Exhibit A.

Through the Flood Study, USACE and the City have developed a Draft Integrated Feasibility Report and Environmental Impact Statement (Draft Report) to defend the 7½ miles of waterfront from flood risks from Heron's Head Park to Aquatic Park.

The Draft Report describes the Draft Plan for coastal flood defenses, cost and benefit analysis, the rationale for choosing the Draft Plan, analysis of environmental impacts under the National Environmental Policy Act (NEPA), and supporting information. The Draft Report was released to the public on January 26, 2024, starting a 60-day formal public comment period. The 60-day comment period runs from January 26 through March 29, 2024. During this period, USACE and the City will be conducting robust public outreach and engagement activities to get feedback on the Flood Study and Draft Plan.

The Draft Plan proposes a \$13.5 billion investment in a safer and more resilient San Francisco. Funding to implement the Draft Plan, if approved by U.S. Congress, will be cost-shared with the federal government with a 65% federal share and 35% local share, representing potentially billions of dollars in federal investment for San Francisco's waterfront resilience. State, regional, and local sources will be required to match federal investment. The Draft Plan will inform subsequent stages of funding and design to develop targeted construction projects. As further described in this report, the Flood Study team is developing phasing concepts to implement the plan over time based on risk reduction, equitable investment, and related factors including other planned investments along the waterfront.

The Flood Study is one part of the Port's activities to increase the Port's resilience to waterfront hazards including earthquakes, coastal flooding, and sea level rise. The Port is engaged on multiple fronts to reduce risks to the waterfront and Port assets. On-going Port efforts including Early Projects and public-private development partnerships to adapt piers, wharves, and seawall lots.

**Early Projects:** Using funding from the Proposition A Seawall Bond and other sources, the Port is advancing the Embarcadero and Southern Waterfront Early Projects (Early

Projects)<sup>1</sup>. The Early Projects are an important step to reduce the most critical and immediate seismic and flood risks.

**Pier Adaptation and Development:** Public-private partnerships have been the Port's primary means of attracting large investment in the waterfront to address resilience and other capital needs. The Port is pursuing this strategy with the Mission Rock, Pier 70, Piers 30-32, and Seawall Lot 330 development projects.

The Draft Plan is a crucial piece of the Port's resilience puzzle with the potential for significant federal funding for waterfront resilience. The Draft Plan must be coordinated with the Port's other resilience, economic development, capital improvement, historic preservation stewardship, and maintenance activities.

Similar to other plans, the Draft Plan will require choices and trade-offs including costs and effects on historic preservation, environmental conditions, maritime operations, economics, transportation, and the public realm among others. This will require the Port and USACE to work with a variety of stakeholders to make certain a balance of trade-offs is arrived at in order to develop and implement a final recommended plan (Recommended Plan).

Today's presentation will provide an update on the Flood Study, review the Draft Plan, outline opportunities for public comment on the Draft Report, and describe the next steps to reach a Recommended Plan for the Flood Study.

## **STRATEGIC OBJECTIVES**

The Port's Waterfront Resilience Program (WRP) and Flood Study support the Port's Strategic Plan goals as follows:

### Engagement:

By leading an inclusive stakeholder process to develop a shared vision, principles, and goals for the WRP and Flood Study and using multiple avenues for public involvement in the development and evaluation of the draft waterfront adaptation strategies released for public review in 2022<sup>2</sup> (Draft Strategies) and review of the Draft Plan towards a final Recommended Plan.

### Equity:

By evaluating Draft Strategies and the Draft Plan through an equity lens to ensure that benefits accrue to, and burdens are minimized for Black, Indigenous, and People of Color (BIPOC) communities. The Flood Study analyzes social impacts and disproportionate impacts on vulnerable communities in the evaluation of the Draft Strategies and development, selection, and refinement of the Draft Plan.

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<sup>1</sup> <https://sfport.com/wrp/embarcadero-early-projects>

<sup>2</sup> [https://sfport.com/files/2022-10/10112022\\_item\\_11a\\_draft\\_waterfront\\_adaptation\\_strategies\\_final.pdf](https://sfport.com/files/2022-10/10112022_item_11a_draft_waterfront_adaptation_strategies_final.pdf)

Resiliency:

By leading the City's efforts to develop waterfront resilience strategies that address threats from earthquakes, coastal flooding, and sea level rise. The Draft Plan would result in coastal flood defenses to increase the City's resilience to coastal flooding and sea level rise, along with associated seismic and inland drainage improvements.

Evolution:

By developing adaptation options with a long time horizon as well as near-term actions, envisioning strategies to adapt the waterfront and its uses over time, and recognizing that decisions made today influence the options available to future generations who will be addressing different environmental and social conditions. The Flood Study is a multi-phase effort that will be built over many decades, even as the Port continues to invest in resilience along the waterfront through other efforts as well.

Sustainability:

By incorporating nature-based features into the Draft Strategies to enhance the quality of the San Francisco Bay water and habitat with the improvements and conducting an environmental quality analysis that considers environmental benefits and impacts in the evaluation of the Draft Strategies and development and selection of a Draft Plan.

Productivity and Economic Recovery:

Through the wise investment of Proposition A Seawall Earthquake Safety Bonds and other Port and public funding sources, and by developing strategies to defend or floodproof Port maritime and industrial facilities and leasable assets to extend their useful life and reduce the risk of coastal flooding and sea level rise.

## **WATERFRONT HAZARDS**

San Francisco faces earthquake and coastal flood risks today. These risks will increase as sea levels rise and extreme storms become more frequent, threatening buildings, small businesses, popular attractions and open spaces, jobs, and critical services such as the Bay Area Rapid Transit (BART) system, San Francisco Municipal Transportation Agency (SFMTA), and the San Francisco Public Utilities Commission (SFPUC) wastewater system. To defend San Francisco from current and future flood risks, there is a need to adapt the shoreline to address up to 7 feet of sea level rise by 2100.

In addition to coastal flooding, waterfront, and inland areas also face stormwater and emergent groundwater hazards that threaten public buildings and infrastructure and private homes and businesses.

San Francisco is also susceptible to seismic hazards. A major earthquake can strike at any time. Aging infrastructure along the waterfront is susceptible to ground shaking, liquefaction, and lateral spreading, which could impact life safety and cause significant damage to buildings and infrastructure, both significant concerns for Port leadership.

## **SAN FRANCISCO WATERFRONT COASTAL FLOOD STUDY**

USACE and the City are collaborating on the San Francisco Flood Study<sup>3</sup> (Flood Study), a general investigation of flood risks to the Port's entire 7½ mile jurisdiction. The study will identify vulnerabilities and recommend strategies to reduce current and future flood risks for consideration for federal investment and implementation along the Port's entire 7½ mile jurisdiction.

The Flood Study is a planning-level feasibility study that analyzes coastal flood risk from 2040 through 2140, identifies and evaluates adaptation strategies, and conducts robust public engagement to inform the development of a Draft Plan. After refining the Draft Plan to address public and technical comments, the Flood Study team will endeavor to complete a Recommended Plan by late 2025, with a goal of a recommendation by the USACE Chief of Engineers to Congress (Chief's Report) by 2026.

The Flood Study is crafted to better understand current and future flood risks, identify flood protection solutions, engage the public to identify priorities and create opportunities for funding for flood risk reduction projects. The Flood Study assesses the benefits and costs of various alternatives to determine the best plan, considering economic, social, and environmental benefits and impacts.

A significant part of federal funding for flood risk mitigation is administered through USACE, making it an important partner for local and regional resilience planning. General investigations are the tool that USACE uses to determine where to invest in federal flood risk reduction funding authorized through the Water Resources Development Act<sup>4</sup> and appropriated by Congress through Energy and Water appropriations.

### **FLOOD STUDY PROCESS**

USACE has established a schedule with key milestones. This aggressive schedule could allow Congress to consider and potentially authorize a flood risk reduction project for the San Francisco shoreline in 2026.

Under this schedule, the USACE and City team has released the Draft Report and is working towards a Recommended Plan and Final Report to Congress by the end of 2025, through the following steps.

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<sup>3</sup> The formal name of the USACE study is the San Francisco Waterfront Coastal Flood Study. The study is focused on 7½ miles of Bay waterfront – not the Pacific Coast. To avoid confusion, the name will be abbreviated to Flood Study during public outreach.

<sup>4</sup> The Water Resources Development Act is biennial legislation that provides for the conservation and development of water and related resources. It authorizes the Secretary of the Army, through the Assistant Secretary of the Army for Civil Works, to conduct studies, construct projects and conduct research activities that can lead to the improvement of rivers and harbors of the United States.

1. **Draft Strategies (Spring – October 2022):** Develop Draft Strategies to solicit public and stakeholder feedback in Fall 2022 – *completed*.
2. **Draft Plan (October 2022 – January 2024):** Conduct robust public outreach and engagement to solicit public feedback on the Draft Strategies. Evaluate the Draft Strategies through qualitative and quantitative tools. Based on public feedback and technical evaluation, develop a Draft Plan, Feasibility Report, and Environmental Impact Statement to bring to public and stakeholder engagement in early 2024 – *completed*.
3. **Recommended Plan (January 2024 – Winter 2025):** Conduct robust and inclusive public outreach and engagement on the Draft Plan, including formal comments on the Draft Report. Following the Draft Plan public release and public outreach, the USACE and City team will revise the Draft Plan based on local and federal reviews with the potential of a Recommended Plan by Winter 2025. The Recommended Plan will include more information on the priority for design and construction of recommended actions in various areas of the waterfront and an initial draft of a phasing plan to guide implementation – *in progress*.
4. **Final Report to U.S. Congress (end of 2025):** USACE will endeavor to present the Final Report and Recommended Plan to the U.S. Congress for potential federal funding as early as late 2025. The Recommended Plan must meet federal requirements that the plan's benefits justify its costs. If Congress approves the Recommended Plan, the federal government will fund up to 65% of the resulting project, providing potentially billions of dollars in federal investment in coastal flood defenses and related benefits along San Francisco's waterfront.

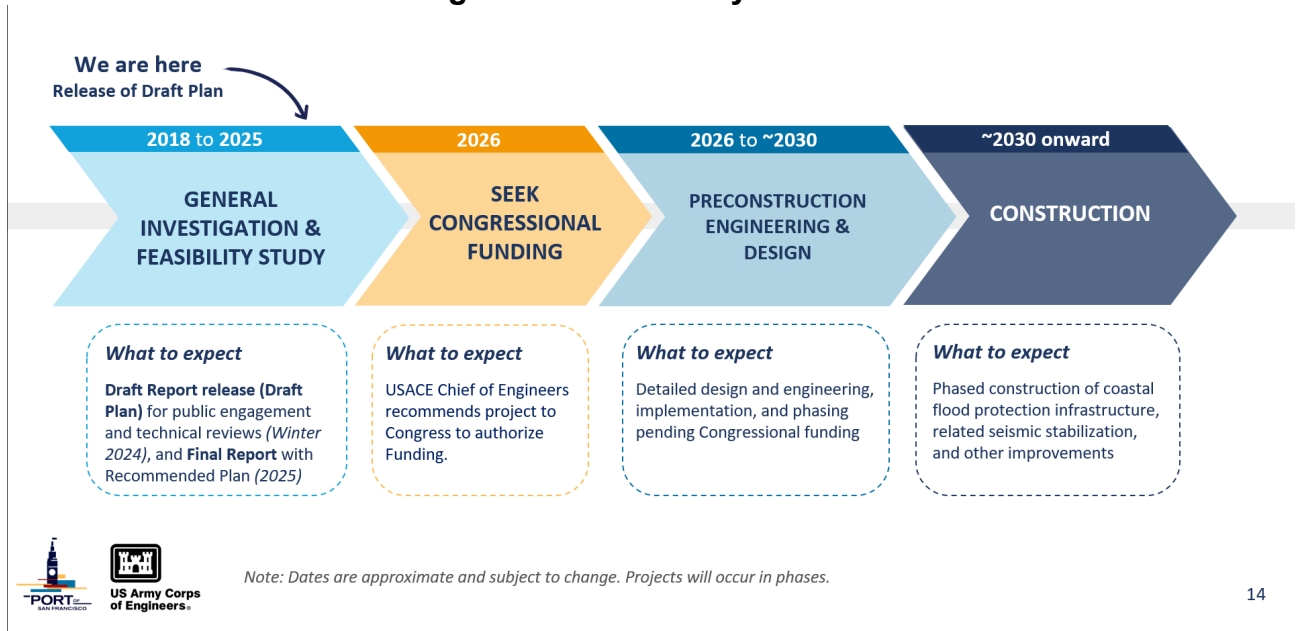
## KEY FLOOD STUDY MILESTONES

- November 2021: Updated Feasibility Cost Sharing Agreement – *completed*.
- October 2022: Draft Strategies public release – *completed*.
- January 2024: Draft Report public release – *completed*.
- Late 2024- Early 2025: Recommended Plan/City endorsement including Port Commission, Board of Supervisors, and Mayor.
- End of 2025: Final Report for submittal to Congress.

If Congress authorizes funding for the Recommended Plan, the Port would continue to partner with USACE to design and deliver the Recommended Plan through subsequent project phases. The Port and USACE would begin design work through the Pre-Construction Engineering and Design (PED) Phase, which would include detailed design, engineering, cost estimation, construction phasing (e.g., priority areas of the shoreline to reinforce and elevate), and implementation funding.

After the PED phase, the Port and USACE would begin to construct elements of the Recommended Plan per the approved phasing and implementation plan. This work would be delivered in phases over multiple decades. All such further work would be conditioned on approval of local and/or federal funding to advance design and construction in phases. See Figure 1 below.

**Figure 1: Flood Study Process**



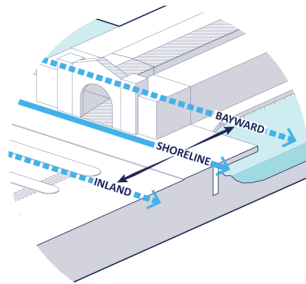
**THE DRAFT PLAN**

The Draft Plan proposes a \$13.5 billion investment in a safer and more resilient San Francisco. It will be implemented through multiple capital projects built in phases over multiple decades. This is an initial estimate; costs need to be refined as the study and further design work advances.

The Draft Plan (see Figure 2 below) establishes approximately where to build coastal flood defenses and how much sea level rise future coastal flood defenses will manage before they need to be adapted to higher water levels. The Draft Plan includes a monitoring and adaptation plan to track sea level rise and global climate change to understand when future sea level rise adaptations will be required.

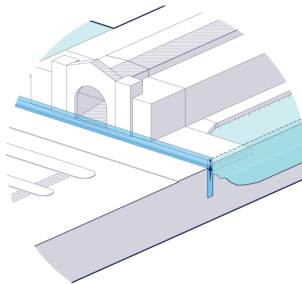
## Figure 2: What's in the Draft Plan

**Where** to build flood defenses



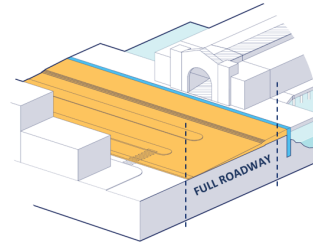
*Have we located the flood defenses in the right place?*

**How high** to build flood defenses



*Should we invest in higher levels of protection first, or adapt in multiple phases?*

**How much space** to use



*More space provides more flexibility but is associated with more disruption. Less space means more abrupt grade changes.*



*...and How flood defenses can be adapted in the future*

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The Draft Plan is not a design for the future waterfront or a plan for the Embarcadero Historic District, the Ferry Building public plazas and roadway, and creek and shoreline amenities. Project plans and implementation strategies will be developed that leverage other opportunities, align with other public and private projects, and reflect what the City can afford given other capital obligations. The Draft Plan does not include a funding plan for the City's required 35% local match. Further work will be conditioned on approval of local and/or federal funding to advance design and construction in phases.

The elements of the Draft Plan vary by each Study area, referred to by USACE as a "Reach" (see Figure 3 below). General elements include adapting and raising the shoreline with seismically sound structures, including seawalls, floodwalls, elevated wharves, berms, and nature-based features. The Draft Plan also includes floodproofing of select buildings (in Reach 1) and low floodwalls around the piers to extend their useful life. Key actions of the Draft Plan are summarized in Figure 3.



### Figure 3: Draft Plan Actions

#### 12 DRAFT PLAN ACTIONS

<p>Raise the shoreline with seismically sound structures</p>	<ol style="list-style-type: none"> <li>1. Raise the shoreline to defend against 1.5' to 3.5' of Sea Level Rise</li> <li>2. Seismic ground improvements to flood defenses</li> <li>3. Closure structures on the bridges/tie into existing bridge project</li> </ol>
<p>Adapt historic waterfront buildings and wharves</p>	<ol style="list-style-type: none"> <li>4. Elevate Historic Buildings like the Ferry Building and bulkhead buildings</li> <li>5. Replace existing wharves with new seismically-sound, elevated wharves</li> </ol>
<p>Floodproof piers and select buildings</p>	<ol style="list-style-type: none"> <li>6. Floodproof select buildings in Fisherman's Wharf</li> <li>7. Construct 2-foot-tall walls around perimeter of the piers</li> </ol>
<p>Incorporate nature based features</p>	<ol style="list-style-type: none"> <li>8. Construct living seawalls</li> <li>9. Build vegetated berms</li> <li>10. Expand wetlands</li> </ol>
<p>Stormwater management adaptation related to flood protection project</p>	<ol style="list-style-type: none"> <li>11. Adapt infrastructure to manage stormwater related to coastal flood defenses</li> <li>12. Build green infrastructure</li> </ol>



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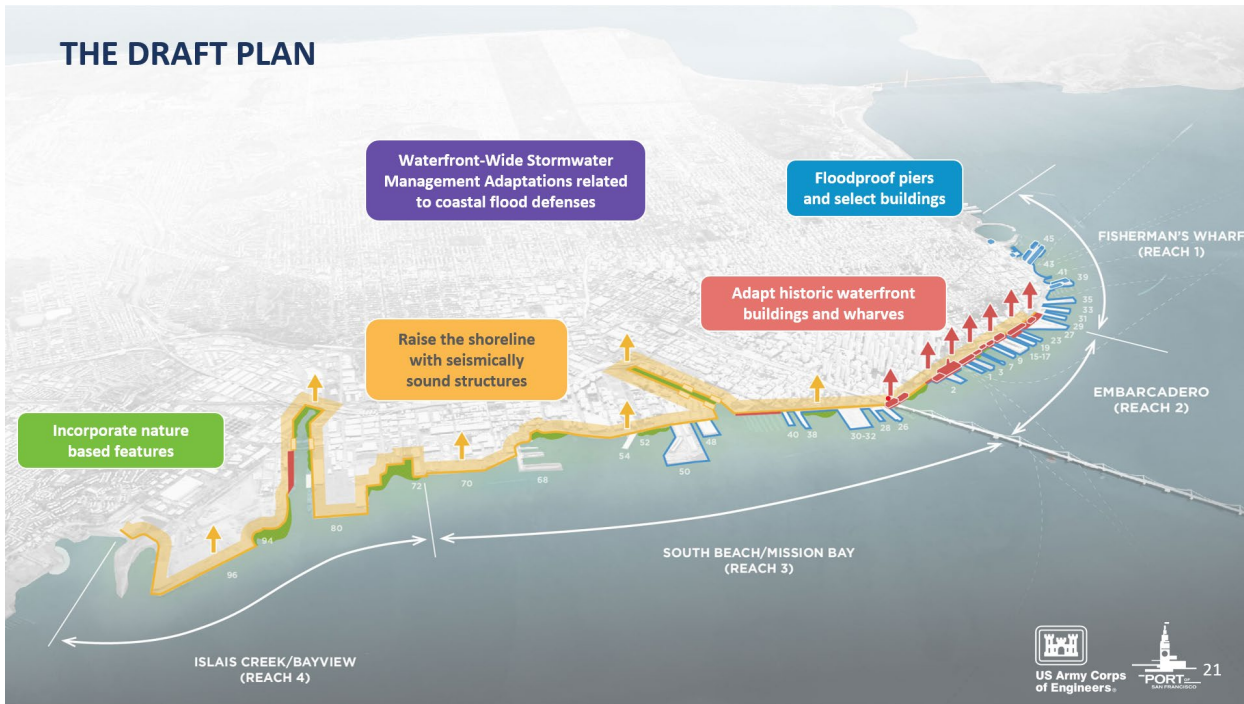


Exhibit B includes a more detailed description of the first actions in the Draft Plan.

#### PUBLIC OUTREACH AND ENGAGEMENT

The Draft Report was publicly released on January 26, 2024, starting a 60-day public comment period. The 60-day comment period runs from January 26 through March 29,

2024. During this period, the Port and USACE will be conducting robust public outreach and engagement activities.

The Draft Report is a Draft Integrated Feasibility Report and Environmental Impact Statement, combining both a description of the development of the Draft Plan and alternatives with an Environmental Impact Statement for environmental analysis under the National Environmental Policy Act (NEPA).

According to the U.S. Environmental Protection Agency, “[federal] agencies evaluate the environmental and related social and economic effects [i.e., impacts] of their proposed actions. Agencies also provide opportunities for public review and comment on those evaluations.”

During the 60-day comment period, the Port and USACE will host four in-person community workshops plus four walking tours, one walking tour per each Study Area (or Reach) to provide that opportunity for public review and comment:

1. Fisherman’s Wharf (Reach 1)
2. Embarcadero (Reach 2)
3. South Beach/Mission Bay (Reach 3)
4. Islais Creek/Bayview (Reach 4)

Staff is hosting two webinars for Port tenants and offering 1:1 briefings for Port tenants with significant waterfront investments. Staff is also contacting private property owners with shoreline properties to offer briefings and inform them of the Draft Plan and public comment options.

Staff has reached out to over 100 community-based organizations to offer briefings and opportunities for feedback on the Draft Plan. Staff will also be hosting two in-person community workshops, one in Chinese and one in Spanish, to provide additional outreach to the Latine and Chinese-American communities, who have previously been underrepresented in WRP outreach efforts. The Port will also offer two webinars that will be open to everyone, as an additional alternative to engage with the plan.

Details and materials, including interactive StoryMaps, are available on the Waterfront Resilience Program website at [www.sfport.com/wrp](http://www.sfport.com/wrp).

A full copy of the Draft Report including appendices can be found at the following location (scroll down to San Francisco Waterfront Coastal Flood Study under Corps Studies): <https://www.swt.usace.army.mil/>

The Port and USACE are seeking public comment on the Draft Plan through March 29, 2024. Public comment on the Draft Plan can help the Port and USACE make decisions about how to prepare for coastal flood risks from sea level rise and more intense storms caused by climate change, and to consider the potential environmental impacts of building coastal flood defenses.

There are several ways that members of the public can comment:

- Join the Port and Army Corps for one of four upcoming community workshops being hosted along the waterfront. Comment cards and a comment recording station will be set up.
- Share written comments online by using the following form: [https://docs.google.com/forms/d/e/1FAIpQLSc0pRdrEYEhtkQcibbL7TrOTMW45hLPJekPoKg1ye51\\_ghnVQ/viewform](https://docs.google.com/forms/d/e/1FAIpQLSc0pRdrEYEhtkQcibbL7TrOTMW45hLPJekPoKg1ye51_ghnVQ/viewform).
- Follow links or QR codes from the online StoryMaps and other materials which can be found here: <https://sfport.com/wrp/draft-plan>.
- Emailing comments to USACE and the Port using this email address: [SFWFRS@usace.army.mil](mailto:SFWFRS@usace.army.mil).

The Flood Study team will be soliciting comments from other sources during this period, including:

- City policymakers, including the Port Commission, Board of Supervisors and the Mayor;
- City agencies including the City Administrator, the Port, the San Francisco Planning Department, SFMTA, SFPUC, and San Francisco Public Works;
- USACE policy reviewers;
- The California State Historic Preservation Officer (SHPO) and consulting parties; and
- Agencies participating in the Resource Agency Working Group, including the San Francisco Bay Conservation and Development Commission, the San Francisco Bay Regional Water Quality Control Board, the National Park Service, the U.S. Environmental Protection Agency, the National Marine Fisheries Service, U.S. Fish & Wildlife Service, the California State Lands Commission, California Fish & Game, and California State Parks.

## **KEY CONSIDERATIONS**

The Flood Study team will continue refining the Draft Plan through the remainder of the Study based on public feedback and technical feedback from USACE reviewers, regional, state, and federal agencies, and City policymakers and departments. A significant goal of this further refinement will be to examine opportunities to reduce the costs and environmental impacts of the Draft Plan and to increase Draft Plan benefits.

The following are key considerations that will inform future work on the Draft Plan:

Phasing:

The Flood Study team is developing phasing concepts to implement the plan over time based on risk reduction, equitable investment, and related factors. Phasing concepts will consider initial actions in some locations that are built to a lower cost and scale, and future actions that are more comprehensive and include seismic improvements and capital replacements of flood defenses such as seawalls, wharves, and berms.

The phasing plan will be designed to be flexible and adaptable to changing rates of sea level rise over time and planned infrastructure or development activities within the footprint of future flood defenses. A key goal of the phasing plan will be to keep the waterfront open for public enjoyment with approaches that minimize the impacts of construction on residents, visitors, and businesses.

Equity:

The Flood Study team will advance continuing work on the Draft Plan guided by federal policies and the Port's Racial Equity Action Plan, with the goal of:

- Centering the voices of communities of color, low-income communities, and disadvantaged and historically marginalized communities through robust, meaningful, and inclusive public outreach and engagement;
- Identifying, developing, and investing in resilience projects that reduce flood and seismic risk in and around disadvantaged and historically marginalized communities;
- Promoting equitable hiring and contracting practices and supporting the development of a diverse workforce to design and deliver projects associated with the Waterfront Resilience Program and the Draft Plan; and
- Collecting data on the equity impacts of the Waterfront Resilience Program's work and using this data to inform future decision-making.

A major concern expressed by City residents is the effect of sea level rise on mobilizing contamination and the potential health and environmental impacts of mobilizing these contaminants. As described in the Draft Report, the Waterfront Resilience Program has reviewed existing documentation on contaminated sites on Port property and the clean-up status of these sites. The Flood Study team will be pursuing further actions to assess environmental contamination in the project area and the potential mobilization impacts noted above, to protect public health and the environment.

Historic Preservation:

The Port is the steward of two historic districts listed on the National Register of Historic Places: the Embarcadero Historic District, including the Ferry Building, the Agriculture Buildings, the Fireboat House and the Port's historic finger piers, wharves and seawall,

and the Union Iron Works Historic District at Pier 70. The Study area includes numerous other locally or federally recognized historic resources, including the Northeast Waterfront Historic District described in Appendix D of Article 10 of the San Francisco Planning Code.

According to the Federal Advisory Council on Historic Preservation:

“Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to consider the effects on historic properties of projects they carry out, assist, fund, permit, license, or approve throughout the country. If a federal or federally-assisted project has the potential to affect historic properties, a Section 106 review will take place.”

The Flood Study team has convened a Historic Preservation Technical Advisory Committee (HPTAC) to guide the development of the Draft Plan and refinements to the Plan. The HP-TAC is comprised of historic preservation organizations, professionals, leaders, and advocates many of which assisted the Port to nominate the waterfront historic districts in 2006 and 2014. Under Section 106, USACE has invited consulting parties, including members of the HPTAC, local Native American tribal representatives, and the SHPO, to participate in the Section 106 consultation process, including the development of a programmatic agreement between the Port, USACE, and the SHPO to guide how the Draft Plan should approach resilience improvements that avoid, minimize, or mitigate effects on historic resources.

To address future flood risk, the Draft Plan proposes a number of significant investments in the Embarcadero Historic District, including:

- elevating the Ferry Building;
- strengthening and/or replacing the seawall from the Ballpark to Telegraph Hill
- temporarily relocating bulkhead buildings and replacing aging wharves with new wharves at a higher elevation from the Bay Bridge to Telegraph Hill; and
- installing short flood walls around existing piers (but keeping piers at their current elevation).

The Draft Plan also proposes the demolition of two historic resources at Pier 70 to allow for the construction of coastal flood defenses: Building 6 and Building 111 in the former shipyard. (Note: the City has requested consideration of future refinements to the Draft Plan to avoid these demolitions).

The Section 106 consultation process will examine these proposed actions and potential mitigation to reduce the impacts of these actions. The National Park Service has published Guidelines on Flood Adaptation for Rehabilitating Historic Properties to inform this analysis<sup>5</sup>.

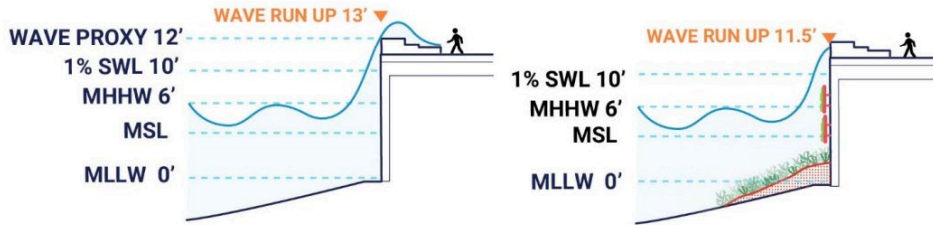
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<sup>5</sup> <https://www.nps.gov/orgs/1739/upload/flood-adaptation-guidelines-2021.pdf>

Engineering with Nature:

The Draft Report includes an Engineering with Nature appendix describing the work of the Flood Study team to incorporate nature-based adaptation in the Draft Strategies and the Draft Plan. Under USACE guidance, these features can continue to be added or considered as the design progresses for two major reasons: 1) the extent to which these features can manage flood risk, and 2) as potential mitigation for Draft Plan environmental impacts. Figure 4 below shows how nature-based features can manage flood risk:

**Figure 4: Wave Runup Reduction with Hybrid Green-Gray Measures**



The Engineering with Nature Appendix identifies five principal criteria that the Flood Study team will continue to use to evaluate the benefits of these features: flood storage, wave attenuation, carbon sequestration, intertidal habitat, and habitat connectivity.

The Port is funding the Living Seawall Pilot to better understand how these approaches can improve habitat along the City's shoreline.

Funding:

The local match requirement for the Draft Plan, assuming the current estimate of \$13.5 billion, would be \$4.6 billion. The Port Finance and Administration and Waterfront Resilience Program teams are studying how other jurisdictions have funded the local match for other large USACE projects. An emerging theme is the need for state funding. The Port team will be collaborating with the City Administrator, the City Controller, and other City finance leaders to develop a realistic plan to fund elements of the Draft Plan over time.

City Agency Comments:

The Draft Report includes a section for "Views of the Non-Federal Sponsor." The City of San Francisco, with Port as the lead agency, has already provided feedback on the Draft Report and ways that the City would like to see the Draft Plan modified after the public comment period to arrive at a Recommended Plan. The Views of the Non-Federal Sponsor contain City issues for further consideration.

More details on the Views of the Non-Federal Sponsor are described in Exhibit F: Draft Report Executive Summary.

## NEXT STEPS

During the public review period, the USACE and City team will receive public, agency, policy, and technical comments through formal public comment and from agency and USACE reviewers. These comments will be used to guide plan refinements. Plan refinements will be identified and described prior to an Agency Decision Milestone, scheduled for Summer 2024. The Agency Decision Milestone represents the USACE decision to prepare a recommendation for Congress on the Recommended Plan.

Following the Agency Decision Milestone, the USACE and City team will refine the plan to develop a Recommended Plan by early 2025, including updated supporting cost, benefit, and environmental analysis. This period will be the opportunity to seek formal City endorsement, including the Port Commission, Board of Supervisors, and Mayor's endorsement of the Recommended Plan. City review of the Recommended Plan may include the opportunity for the Port Commission, Board of Supervisors, and the Mayor to provide direction to the Flood Study team to consider further plan refinements during the design phase of the project, including potential "betterments" the City desires to include at its own expense. The Recommended Plan will then be reviewed by USACE leadership to arrive at a final Recommended Plan that will be presented to U.S. Congress as early as 2026.

Today, staff seeks to inform the Port Commission about the Flood Study and Draft Plan, describe the process for providing public feedback, and hear your initial feedback on the Draft Plan. We are excited to work with our City and Federal partners towards a Recommended Plan, to meet the Port Commission's goals under the Port's Strategic Plan, and to ensure the waterfront is resilient to flood and other hazards.

Prepared for: Brad Benson, Waterfront Resilience Director

Prepared by: Adam Varat, Waterfront Resilience Deputy Program Manager, Planning

Attachments: Exhibit A – Flood Study Timeline  
Exhibit B – Draft Plan First Actions  
Exhibit C – Waterfront Resilience Program Background and Work to Date  
Exhibit D – Draft Waterfront Adaptation Strategies  
Exhibit E – Flood Study Technical Evaluation  
Exhibit F – Summary of Public Outreach  
Exhibit G – Draft Report Executive Summary  
Exhibit H – Glossary of Terms

## **Exhibit A: USACE San Francisco Waterfront Flood Study Timeline**

- 2014 USACE San Francisco District undertakes a Federal Interest Determination for Continuing Authorities Program Section 103 (CAP103) study of flood risk in the Ferry Building area.
- 2016 The USACE San Francisco District issued a Draft Federal Interest Determination Report for the CAP 103 Study of the Ferry Building Area which recommends a full general investigation (feasibility study) for the San Francisco waterfront.
- 2018 With the support and leadership of Speaker Emerita Pelosi, Senator Feinstein, and Senator Harris, Congress appropriates \$500,000 to initiate the San Francisco Waterfront Coast Flood Study (Flood Study). USACE and the Port of San Francisco enter a cost-sharing agreement and start the Flood Study.

San Francisco voters approve Proposition A, Seawall Earthquake Safety Bond.

- 2020 The Port releases the results of the Proposition A-funded Embarcadero Seawall Multi-Hazard Risk Assessment.

Speaker Pelosi, Senator Padilla, and Senator Feinstein author Water Resources Development Section 152 requiring fair treatment of seismically active areas for purposes of USACE benefit-cost analysis.

- 2021 Speaker Pelosi secures the final \$5 million in federal funding to complete the Flood Study through the Infrastructure Investment and Jobs Act.

USACE issues new guidance for the Flood Study requiring the Tulsa District mega-study team to use a comprehensive benefits approach to the Study and analysis of multi-hazard plans to adapt to sea level rise.

- 2022 Speaker Pelosi amends Water Resources Development Section 152 requiring fair treatment of seismically active areas for purposes of USACE benefit cost analysis.

Representative Speier authors Water Resources Development Section 203 authorizing USACE to examine tidal flooding with Speaker Pelosi's support.

- 2024 USACE and the Port release the San Francisco Waterfront Coastal Flood Study with the Draft Plan for public review and comment.



## Exhibit B: Description of Draft Plan (First Actions)

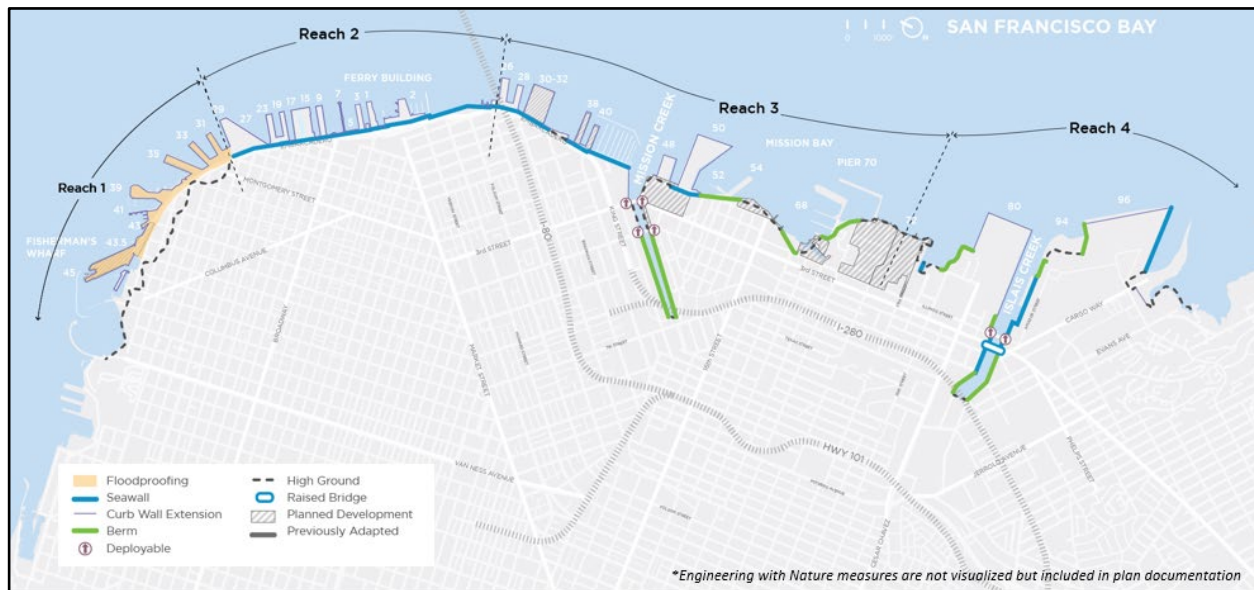
*Note: This description of the Draft Plan first actions is excerpted from the Flood Study, Appendix A: Plan Formulation. The term Draft Plan is used here in place of the USACE term “Tentatively Selected Plan.” For a description of subsequent actions, please see the Flood Study Report, Appendix A: Plan Formulation.*

The Draft Plan with seismic ground improvements is identified as the Tentatively Selected Plan because it is responsive to the study guidance and creates a resiliency strategy that maximizes effectiveness across a broad array of future risk scenarios.

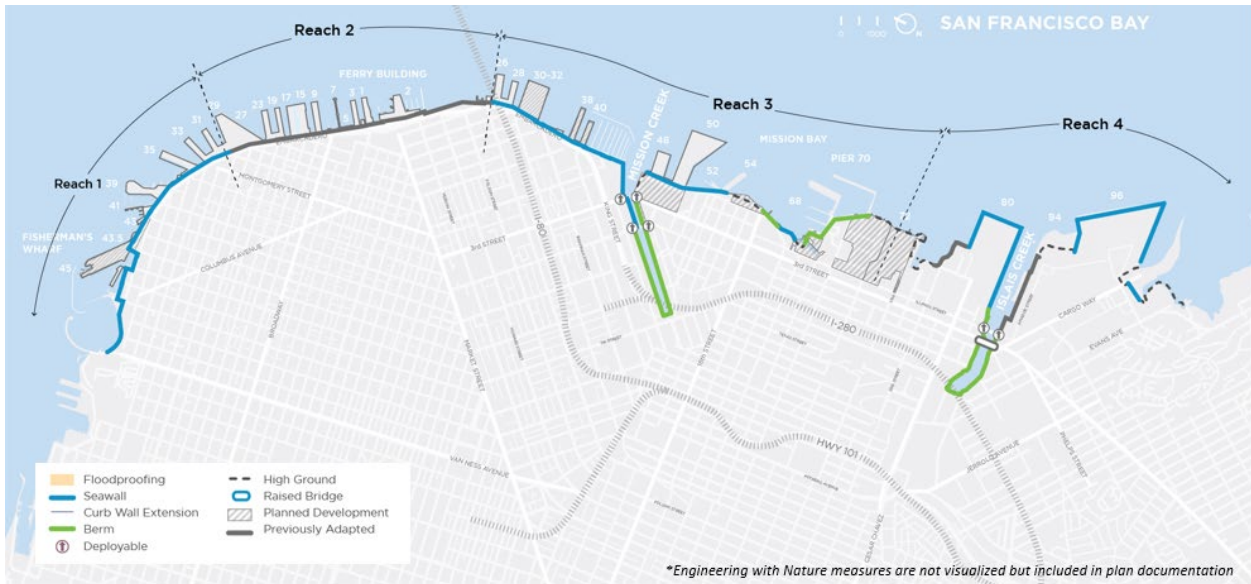
The Draft Plan as described here follows the planning assumptions required for analysis, using 2040 and 2090 as approximate first and subsequent action years. However, the PDT recognizes that the Draft Plan subsequent actions will be reconsidered over time based on monitoring SLR and other changing conditions, as described in *Appendix G: Monitoring and Adaptation Plan*.

The Draft Plan includes natural and nature-based features (NNBFs) for coastal flood risk reduction, and it can be further optimized for NNBFs by reviewing the full range of NNBFs across all alternatives, selecting the best NNBFs to maximize coastal flood risk reduction and net benefits (*Appendix I: Engineering with Nature*), and incorporating them as part of future plan refinements.

The Draft Plan is a cost-effective, hybridized plan that combines retreat and defends measures, scaled to perform under the lowest initial risk and to adapt to the risk of a higher rate of regional sea level change (RSLC) as a potential subsequent action. Initial actions (**Figure A-1**) are proposed to align expenditures and subsequent actions (**Figure A-2**) that add height or adapt measures with the arrival of increased risk in later years.



**Figure A-1: Proposed First Actions for the Draft Plan**



**Figure A-2: Proposed Second Actions for the Draft Plan**

The features of the Draft Plan by reach for initial actions are described below.

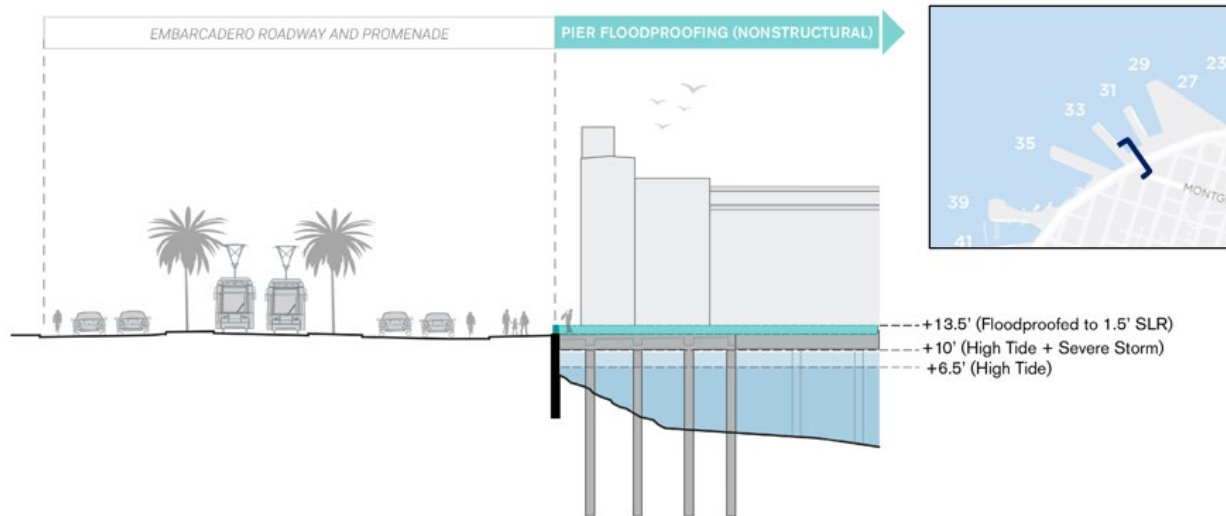
### **Fisherman’s Wharf to Telegraph Hill (Reach 1)**

In Fisherman’s Wharf, the Draft Plan initially relies on floodproofing buildings and later elevates the shoreline with floodwalls. Along the Embarcadero, the Draft Plan elevates the shoreline in place by raising and reconstructing the bulkhead walls and pile-supported wharves north of the Bay Bridge while gradually transitioning down from the new shoreline elevation back to the existing city grade to retain visual and physical access to the waterfront. The plan includes reconstruction and redesign of the Embarcadero roadway – the surface design of the Embarcadero roadway and promenade will be determined in future project phases. The Ferry Building and bulkhead buildings are raised in place. Piers are floodproofed with concrete curbs around the perimeter to reduce flood risk.

The Draft Plan in Reach 1 includes the following **initial actions** (*Gray and black represent existing conditions; teal represents Draft Plan first actions*).

**Figure A-3):**

- Floodproof a subset of buildings in Fisherman’s Wharf, such as the Dolphin Club and buildings at Pier 45, Pier 39, and Pier 31.
- Consider removing or floodproofing select additional buildings in Fisherman's Wharf based on risk profile, age, condition, and historic status.



*Gray and black represent existing conditions; teal represents Draft Plan first actions.*

**Figure A-3: Draft Plan First Actions: Fisherman's Wharf to Telegraph Hill (Reach 1), Typical Cross Section within Embarcadero Historic District**

## Telegraph Hill to Bay Bridge (Reach 2)

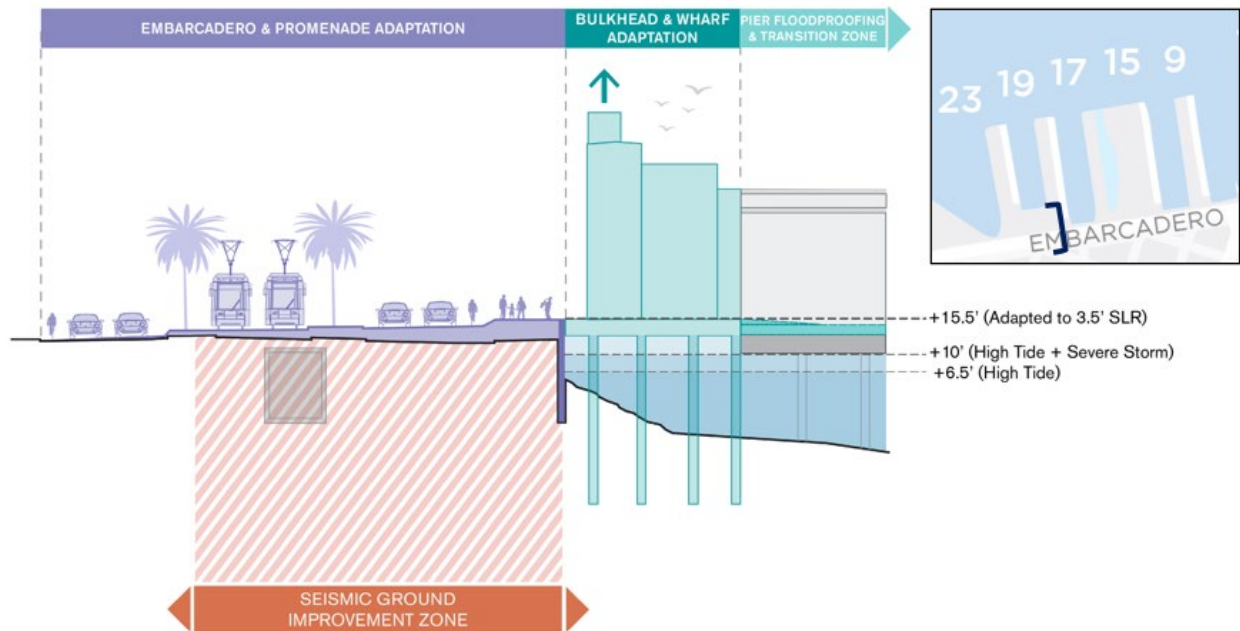
Along the Embarcadero, the Draft Plan elevates the shoreline in place by raising and reconstructing the bulkhead walls and pile-supported wharves north of the Bay Bridge while gradually transitioning down from the new shoreline elevation back to the existing city grade to retain visual and physical access to the waterfront. The plan includes reconstruction and redesign of the Embarcadero roadway – the surface design of the Embarcadero roadway and promenade will be determined in future project phases. The Ferry Building and bulkhead buildings are raised in place. Piers are floodproofed with concrete curbs around the perimeter to reduce flood risk.

The Draft Plan in Reach 2 includes the following **initial actions** (*Gray and black represent existing conditions; teal represents Draft Plan first actions.*

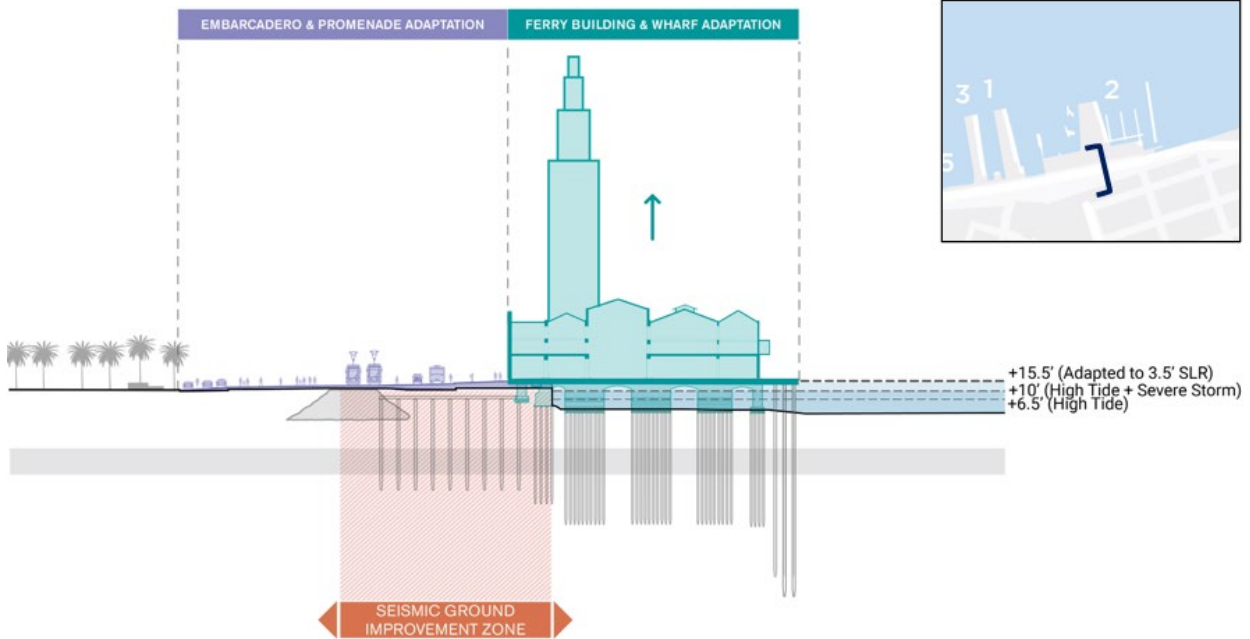
**Figure A-3):**

- From Pier 27-29 to the Bay Bridge, raise the shoreline along the Embarcadero by 3.5 to 7.5 feet to defend against 3.5 feet of SLR (finish elevation of 15.5 feet NAVD88) using raised and rebuilt bulkhead walls and wharves, approximately aligned with the location of the existing structures. Provide Embarcadero Promenade and Bay Trail access atop and adjacent to the raised ground and wharves.
- Perform ground improvement to reduce lateral spreading and liquefaction risk along the coastal flood defense alignment to ensure desired seismic performance.
- Construct a 2-foot-tall concrete curb around the perimeter of piers from Pier 47 to Pier 24.

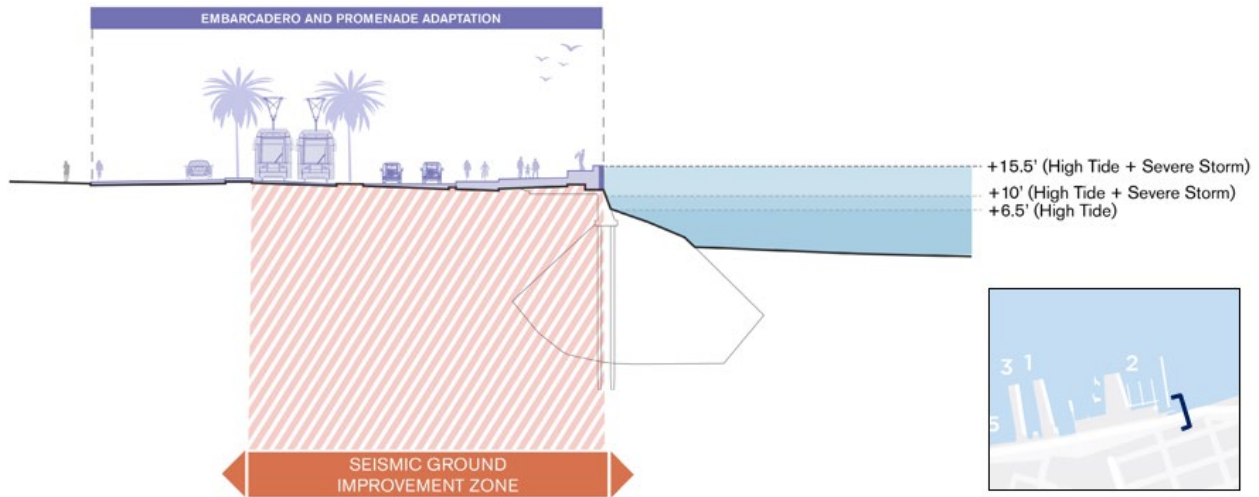
- Replace existing wharves with new ductile concrete wharves with deck elevation to match the top of the new bulkhead seawall. Transition grade from raised wharf and bulkhead building to existing pier elevation.
- Raising the shoreline in place requires reconstruction of the full Embarcadero roadway and results in a likely reduction of the overall roadway width. Design of the mobility corridor and specific utilization of the available space will be done during the pre-construction, engineering, and design (PED) phase.
- Elevate buildings on wharves north of the Bay Bridge, including the Ferry Building, Agriculture Building, bulkhead buildings, and more.
- Build infrastructure to manage stormwater. Coordinate with SFPUC, San Francisco Public Works, and other stakeholders on changes to the combined sewer system, expanded green corridors, and other features to reduce inland flood risk exacerbated by the coastal flood defense structures.



Gray and black represent existing conditions; orange, purple, and teal represent Draft Plan first actions.  
**Figure A-4: Draft Plan First Actions: Telegraph Hill to Bay Bridge (Reach 2), Typical Cross Section within Embarcadero Historic District**



Gray and black represent existing conditions; orange, purple, and teal represent Draft Plan first actions.  
**Figure A-5: Draft Plan First Actions: Telegraph Hill to Bay Bridge (Reach 2), Ferry Building**



Gray and black represent existing conditions; orange and purple represent Draft Plan first actions.  
**Figure A-6: Draft Plan First Actions: Telegraph Hill to Bay Bridge (Reach 2), Rincon Park**

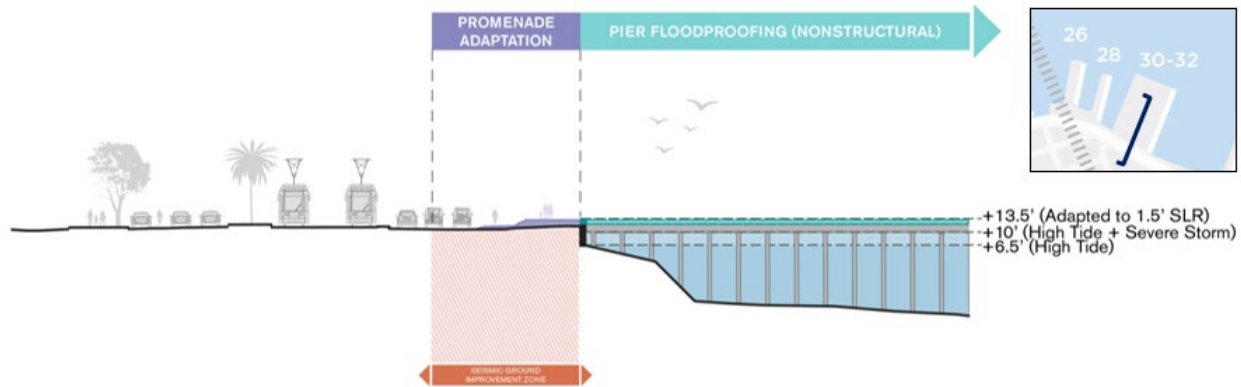
In the Mission Creek/Mission Bay geography, the Draft Plan defends existing city and community assets in place by elevating the creek and Bay shorelines with levees, floodwalls, and raised and rebuilt bulkhead walls and wharves. The coastal defense will tie into existing and planned high ground at Bayfront, Agua Vista, and Crane Cove Parks, and the Mission Rock and Pier 70 development areas. The plan also includes partial reconstruction and redesign of the Embarcadero roadway south of the Bay Bridge.

The Draft Plan in Reach 3 includes the following **initial actions** (Figure A-7 to Figure A-9):

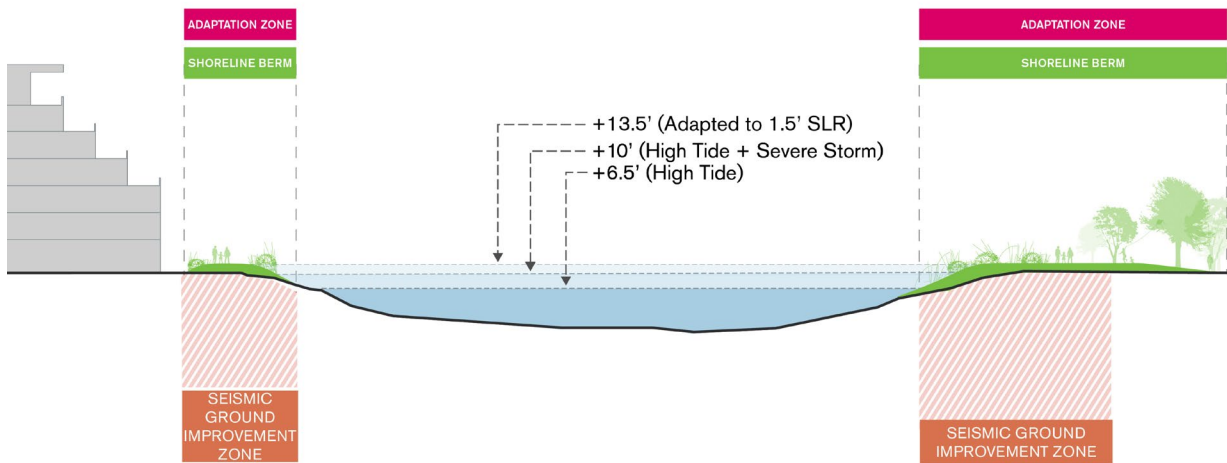
- Raise the Bay and creek shorelines to defend against 1.5 feet of SLR (13.5 feet NAVD88) using a combination of 1.5- to 4.5-foot-tall walls, levees, and raised and rebuilt bulkhead walls and wharves, depending on existing shoreline elevations. Provide Bay Trail access atop and adjacent to bayside levees and wharves.
- Install 2-foot-tall concrete curbs around the perimeters of piers from Pier 26 to Pier 50.
- Perform ground improvement to reduce lateral spreading and liquefaction risk along the coastal flood defense alignment to ensure desired seismic performance.
- Install deployable closure structures at the northern and southern abutments of 3<sup>rd</sup> and 4<sup>th</sup> Street bridges over the creek to defend landward buildings and infrastructure from flood damage. Service across bridges will be disrupted for hours to days during high water events. The likelihood of closure is anticipated to be approximately one closure on average every 25-200 years (0.5-4% annual chance) by 2060.<sup>6</sup>
- Tie measures into existing high ground and planned development projects at Bayfront, Agua Vista, and Crane Cove Parks, and the Mission Rock and Pier 70 development areas.
- Enhance wildlife habitat on levees along the shoreline using NNBFs.
- Remove select buildings at Pier 68/70 shipyard for construction of coastal levee or adjust the alignment of coastal levee features to avoid historic resources where the structures have ground floor elevations that are above 13.5 feet NAVD88.
- Build infrastructure to manage stormwater. Coordinate with SFPUC, San Francisco Public Works, and other stakeholders on changes to the combined sewer system, expanded green corridors, and other features to reduce inland flood risk exacerbated by the coastal flood defense structures.

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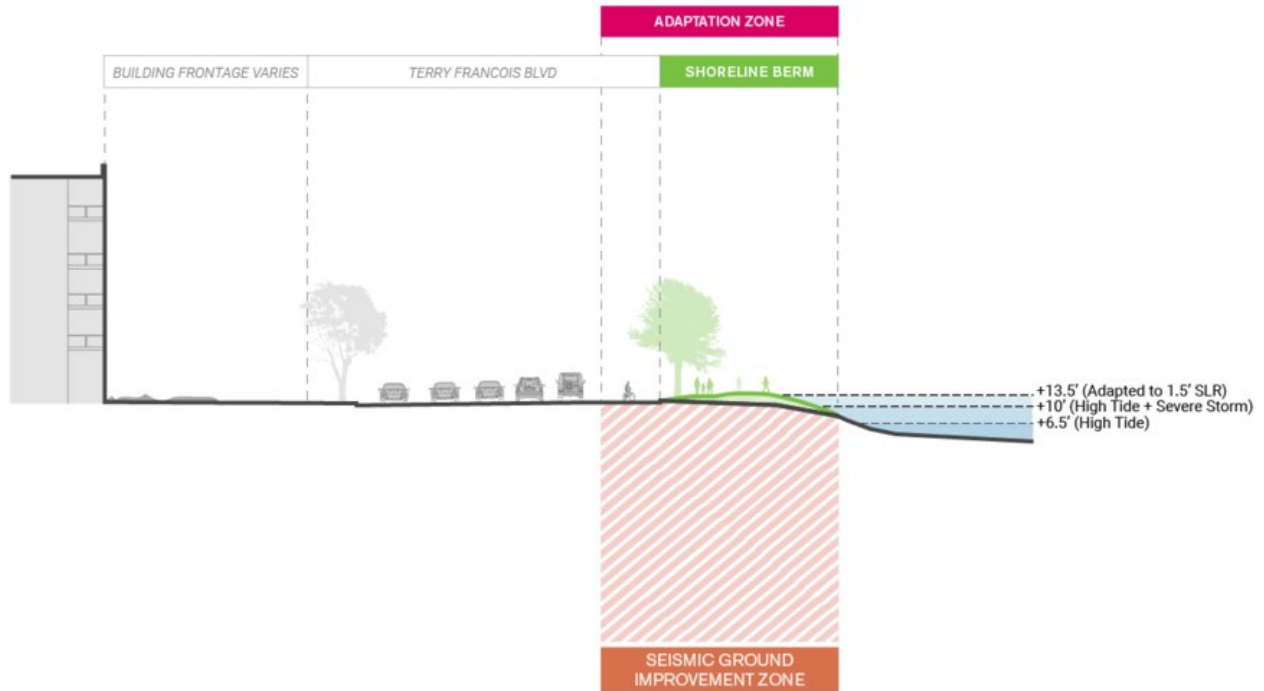
<sup>6</sup> Based on USACE intermediate and high regional sea level change (RSLC).



Gray and black represent existing conditions; orange, purple, and teal represent Draft Plan first actions.  
**Figure A-7: Draft Plan First Actions: Bay Bridge to Potrero Point (Reach 3), Pier 30/32**



Gray and black represent existing conditions; orange, pink, and green represent Draft Plan first actions.  
**Figure A-8: Draft Plan First Actions: Bay Bridge to Potrero Point (Reach 3), Mission Creek**



Gray and black represent existing conditions; orange, pink, and green represent Draft Plan first actions.  
**Figure A-9: Draft Plan First Actions: Bay Bridge to Potrero Point (Reach 3), Terry Francois Boulevard**

#### **Islais Creek/Bayview (Reach 4)**

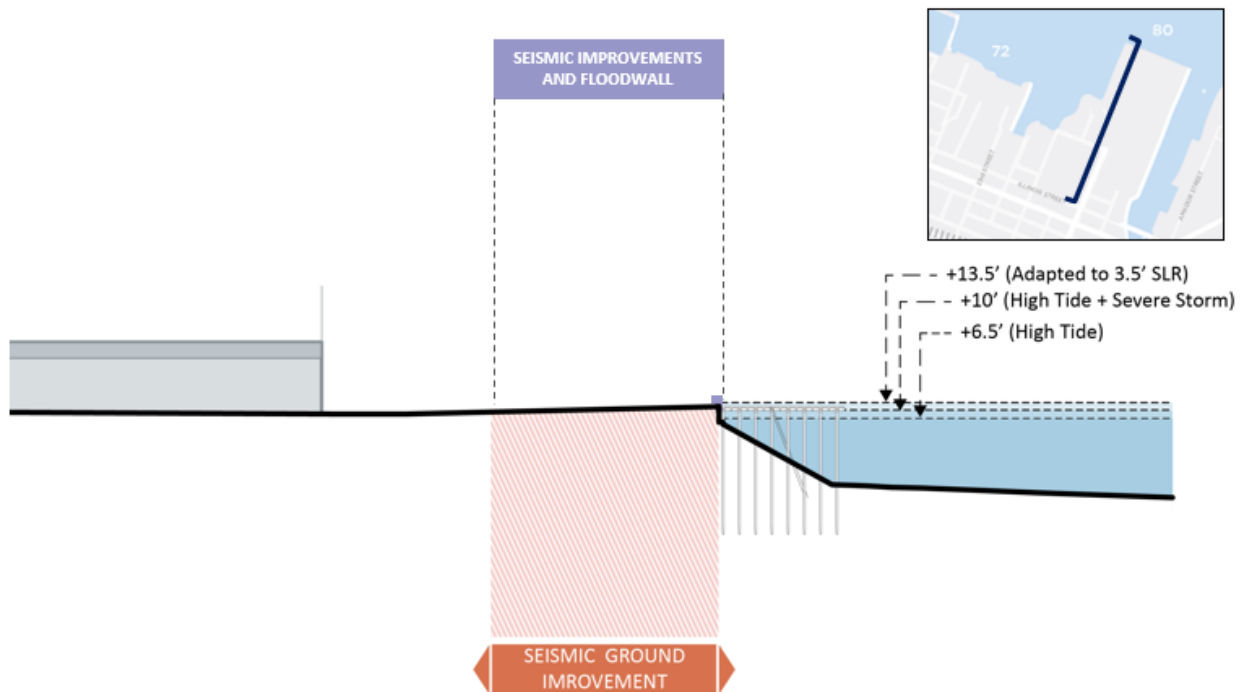
In the Islais Creek/Bayview geography, the Draft Plan defends the existing shoreline to retain residential and commercial land uses in place, including POSF land uses and maritime facilities. The flood defenses consist of raising the shoreline using levees and bulkhead walls, raising and rebuilding marginal wharves and deployable closure structures, and tying into existing or planned high ground near Potrero Power Station and behind the Pier 94 Wetlands (Port backlands). This area of the waterfront contains large parcels independent of the combined sewer system, such that the elevated shoreline will require modification to handle stormwater in a safe and effective manner.

The Draft Plan in Reach 4 includes the following **initial actions** (Figure A-10 to Figure A-12):

- Elevate the bay and creek shorelines using a combination of 2.5- to 5.5-foot-tall levees, floodwalls, and curb extensions to defend against 1.5 feet of SLR (13.5 feet NAVD88). Defenses tie into high ground at Warm Water Cove, the western end of Islais Creek, Pier 94 Wetlands, Heron's Head Park, and near the southern boundary of the study area.
- Install a 2-foot-tall concrete curb at the edge of Pier 80 and Pier 94-96 to provide coastal flood protection while maintaining function for maritime uses.
- Perform ground improvement to reduce lateral spreading and liquefaction risk along the coastal flood defense alignment to ensure desired seismic performance.

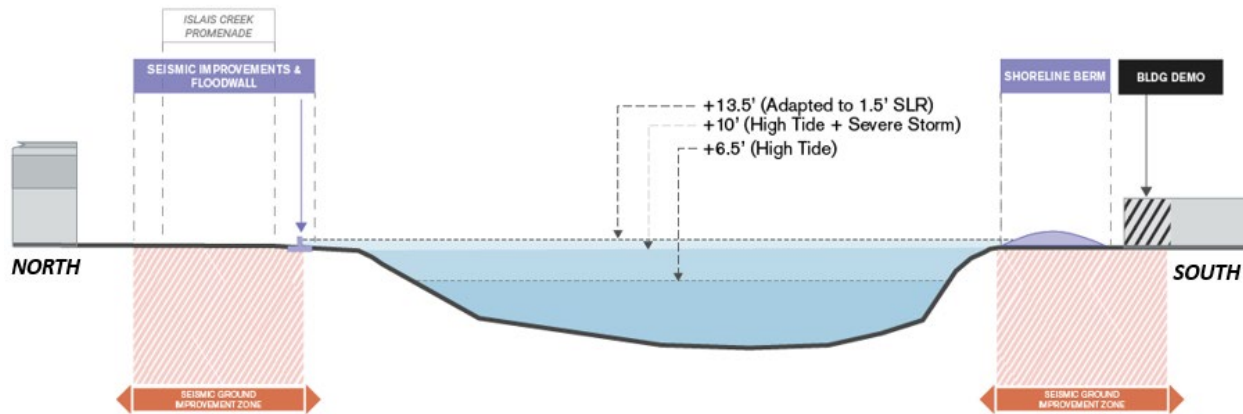


- Incorporate NNBFs into Warm Water Cove, at the interface of Pier 94 Wetlands and Pier 96, and along portions of the Islais Creek bank.
- Install deployable closure structures at the north and south abutments of Illinois Street Bridge to be activated in advance of a coastal storm.
- 3rd Street Bridge will be rebuilt at a higher elevation<sup>7</sup> per the San Francisco Public Works existing project, outside of the Flood Study (FWOP condition).
- Reconstruct Pier 90 and 92 wharves at 13.5 feet NAVD88 elevation and incorporate them into the coastal defense system.
- Consider removing portions of warehouses near the south banks of Islais Creek and west of the bridges to make room for levee features, as well as portions of the Pier 96 building that extends south of the pier edge, and one building straddling the wharf edge at Pier 90.
- Build infrastructure to manage stormwater. Coordinate with SFPUC, San Francisco Public Works, and other stakeholders on changes to the combined sewer system, expanded green corridors, and other features to reduce inland flood risk exacerbated by the coastal flood defense structures.

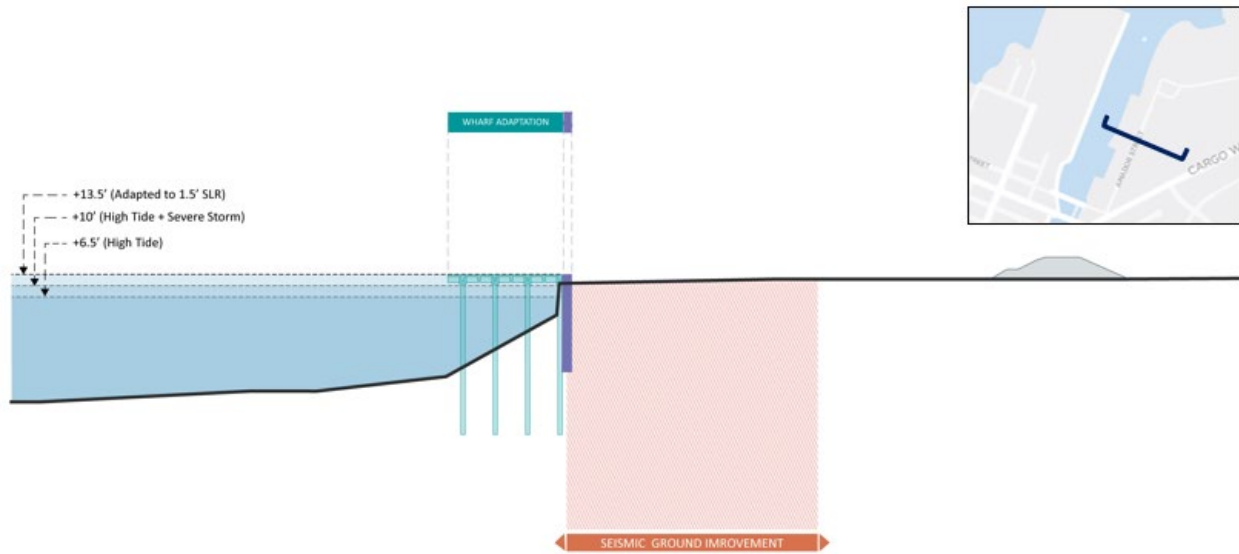


*Gray and black represent existing conditions; orange and purple represent Draft Plan first actions.*  
**Figure A-10: Draft Plan First Actions: Potrero Point to Heron's Head Park (Reach 4), Pier 80**

<sup>7</sup> Rebuilding of 3<sup>rd</sup> Street Bridge at higher elevation is external to the Flood Study project (i.e., it is part of the FWOP condition).



Gray and black represent existing conditions; orange and purple represent Draft Plan first actions.  
**Figure A-11: Draft Plan First Actions: Potrero Point to Heron's Head Park (Reach 4), Islais Creek**



Gray and black represent existing conditions; orange, purple, and teal represent Draft Plan first actions.  
**Figure A-12: Draft Plan First Actions: Potrero Point to Heron's Head Park (Reach 4), Pier 92**

## **Exhibit C: Waterfront Resilience Program Background and Work to Date**

The Port of San Francisco's treasured waterfront is vulnerable to hazards, including urgent seismic risk and increasing flood risks from sea level rise. To protect this resource - from the iconic landmarks, cultural and art destinations, and beautiful open spaces connected to the Bay, to the diverse maritime industries and businesses, and key emergency, transportation, and utility infrastructure, the Port has established the Waterfront Resilience Program (WRP). The Program works to ensure the waterfront, and its critical regional and citywide assets, are resilient to hazards - and increasingly accessible to everyone it serves.

In 2018, the San Francisco Board of Supervisors proposed Proposition A Seawall Earthquake Safety Bonds. San Francisco voters approved this bond with a margin of 83-17% at the November 6, 2018 election. At the time, the Port and the City acknowledged that Proposition A was a vital down payment to address seismic and flood risks along the waterfront.

In 2020, the Port released the results of the Embarcadero Seawall Multi-Hazard Risk Assessment (MHRA) to examine the impacts on Port, City, regional, and privately-owned assets and infrastructure from a variety of potential seismic and flood events for the 3 miles of Embarcadero Seawall, from Fisherman's Wharf to Mission Creek. The MHRA was presented to the Port Commission on September 22, 2020<sup>8</sup>.

The WRP has developed 23 early projects to address the most urgent earthquake safety, disaster response, and coastal flood risks within the Embarcadero Seawall portion of the waterfront. The program team presented these early projects to the Port Commission on December 14, 2021<sup>9</sup>. These early projects are near-term investments such as seismic retrofits, improvements to disaster response facilities, shoreline stability, and near-term flood risk reduction projects. Early projects can be delivered with Proposition A funding, federal and state grants, investments by long-term tenants or through public-private partnerships, City agencies' capital programs, and the Port through its Capital Improvement Program.

WRP staff presented an update on Embarcadero Early Projects at the September 13, 2022, Port Commission meeting. Six projects have completed Needs Assessment Reports and are starting Alternatives Analysis, the second of three pre-design steps used in the Program. The first Embarcadero Early Projects are entering detailed design in 2024 and

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<sup>8</sup> September 22, 2020 Staff Report:  
<https://sfport.com/meetings/san-francisco-port-commission-september-22-2020>

<sup>9</sup> December 14, 2021 Staff Report:  
<https://sfport.com/meetings/san-francisco-port-commission-december-14-2021>

construction on at least one Embarcadero Early Project is expected to start before the end of 2024.

The Port completed an Initial Southern Waterfront Earthquake Assessment, which compiled existing information, highlighted information gaps, and identified potential seismic hazards and vulnerabilities based upon limited analysis and professional judgment. The findings of the Initial Southern Waterfront Earthquake Assessment were presented to the Port Commission in September 2022, along with the next steps which include two projects that begin to address seismic hazards in the southern waterfront. Findings from this assessment have also informed the development of Adaptation Strategies on the southern waterfront.

In Fall 2022, the Port and USACE publicly released the Draft Waterfront Adaptation Strategies (Draft Strategies). See Exhibit D.

## Exhibit D: Draft Waterfront Adaptation Strategies

The USACE and City Flood Study team developed seven Draft Strategies based on over five years of public engagement. The team presented the Draft Strategies at the October 11, 2022, Port Commission hearing, followed by three months of robust and inclusive public outreach and engagement on the Draft Strategies.

The Draft Strategies are different ways for the City to reduce flood risk along the Port's entire waterfront jurisdiction, from Heron's Head Park to Fisherman's Wharf. The Draft Strategies guide decisions about:

- Where, when, and how high to build flood defenses
- How and when to adapt key buildings and infrastructure to ensure continued operations of City services
- How to incorporate nature-based and ecological features

The Draft Strategies include a combination of coastal flood defense measures (such as seawalls, levees, berms, and natural features) to build a continuous coastal flood defense system along the Port shoreline. They also include adaptations to buildings and infrastructure in the coastal flood zone (such as floodproofing or relocating structures).

Each strategy varies in how it is applied to different parts of the waterfront. Each strategy was formulated for a mid-century adaptation (2040) and an end-of-century adaptation (2090). The team will develop a more nuanced phasing strategy as the Study progresses.

The Draft Strategies include:

- **Strategy A NO ACTION:** Takes no actions to reduce flood risks beyond projects that are already approved.
- **Strategy B NONSTRUCTURAL OPTION:** Moves people and assets away from the risk, uses nonstructural measures (such as floodproofing) to reduce risks, and allows water to go where it wants rather than constructing traditional structural solutions.
- **Strategy C LOWER SEA LEVEL RISE:** Adapt the shoreline to withstand 1.5' of sea level rise by 2040 using a combination of structural and nonstructural measures.
- **Strategy D LOWER SEA LEVEL RISE - ADAPTABLE:** Adapts the shoreline to withstand 1.5' of sea level rise by 2040, with the possibility of building higher by 2090.
- **Strategy E HOLD THE LINE:** Preserves a waterfront that looks and functions much as it does today by adapting the shoreline.

- **Strategy F MANAGE THE WATER:** Creates an active system for managing flooding by heavily relying on machinery.
- **Strategy G ALIGN WITH WATERSHEDS:** Advances shoreline adaptation while working with natural inland flooding patterns to floodproof some buildings and infrastructure and move others away from highest-risk areas.

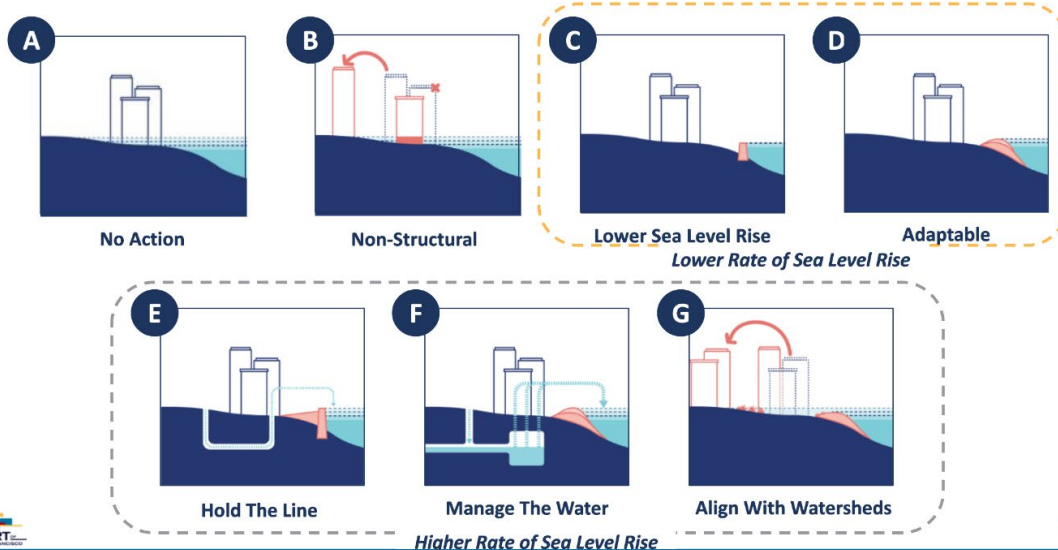
See the Port’s Waterfront Resilience Program website for full descriptions of the Draft Strategies<sup>10</sup>.

**Figure D-1. Sea Level Rise Adaptation Level by Strategy**

Strategies		Sea Level Rise (SLR) Level		
		+1.5'	+3.5'	+7'
Strategy A	No Action			
Strategy B	Nonstructural Option	✓	✓	✓
Strategy C	Lower Projected Sea Level Rise	✓		
Strategy D		✓	✓	
Strategy E	Higher Projected Sea Level Rise	✓	✓	✓
Strategy F		✓	✓	✓
Strategy G		✓	✓	✓

**Figure D-2. Draft Waterfront Adaptation Strategies**

**DRAFT WATERFRONT ADAPTATION STRATEGIES**



<sup>10</sup> <https://sfport.com/wrp/waterfront-adaptation>

## Exhibit E: Flood Study Technical Evaluation

The USACE and Port Flood Study team evaluated the Draft Strategies using four benefits categories, including:

- National Economic Development (NED)
- Regional Economic Development (RED)
- Other Social Effects (OSE), and
- Environmental Quality (EQ)

Each benefit category evaluates several metrics, as shown in Figure C-1.

**Figure E-1. Flood Study Benefit Categories**

National Economic Development (NED)	Regional Economic Development (RED)	Other Social Effects (OSE)	Environmental Quality (EQ)
<p>Total Project Cost</p> <p>Physical Damages</p> <ul style="list-style-type: none"> <li>• Structure Damage</li> <li>• Content Damage</li> <li>• Asset Condemnation Loss</li> <li>• Critical Infrastructure Damage</li> </ul> <p>Non-Physical Damages</p> <ul style="list-style-type: none"> <li>• Land Loss (Intensification)</li> <li>• Critical Service Disruptions</li> <li>• Recreation Value Loss</li> <li>• Transportation Delay Loss</li> <li>• Recovery and Cleanup Costs after Disaster</li> </ul>	<p>Business Economic Disruptions</p> <ul style="list-style-type: none"> <li>• Changes in production / expenditures by producers / consumers</li> <li>• Changes in B 2 B purchases in supply chains</li> <li>• Downstream change in household spending</li> </ul> <p>Population Economic Impacts</p> <ul style="list-style-type: none"> <li>• Labor employment loss</li> <li>• Revenue Impacts</li> <li>• Recology, BART, SFMTA, SFBR, Ferry, SFPUC, etc.</li> </ul>	<p>Health and Safety</p> <ul style="list-style-type: none"> <li>• Life Safety Risk</li> <li>• Exposed Population</li> <li>• Evacuation Routes</li> <li>• Contaminated Sites</li> <li>• Displaced Population</li> <li>• Shelter Needs</li> <li>• Utility Health Impacts</li> </ul> <p>Economic Vitality</p> <ul style="list-style-type: none"> <li>• Home Ownership vs Renter</li> <li>• Housing Affordability</li> </ul> <p>Social Connectedness</p> <ul style="list-style-type: none"> <li>• Transit corridor and recreation exposure</li> <li>• Mental Stress and Anxiety</li> <li>• Lost Productivity</li> </ul> <p>Community Identity</p> <ul style="list-style-type: none"> <li>• Community Services</li> <li>• Cultural / Historic Assets</li> <li>• Community Access to Services</li> </ul> <p>Social Vulnerability and Resilience</p> <ul style="list-style-type: none"> <li>• Underserved communities</li> </ul> <p>Disproportionate effects</p>	<p>Physical Environment</p> <ul style="list-style-type: none"> <li>• Sediment beneficial reuse</li> <li>• Flood storage</li> <li>• HTRW (contaminated sites)</li> <li>• Water Quality</li> <li>• Wave Attenuation</li> <li>• Carbon Sequestration</li> </ul> <p>Biological Environment</p> <ul style="list-style-type: none"> <li>• Subtidal Habitat</li> <li>• Intertidal Habitat / Wetlands</li> <li>• Habitat Connectivity</li> <li>• Threatened and Endangered Species</li> </ul>

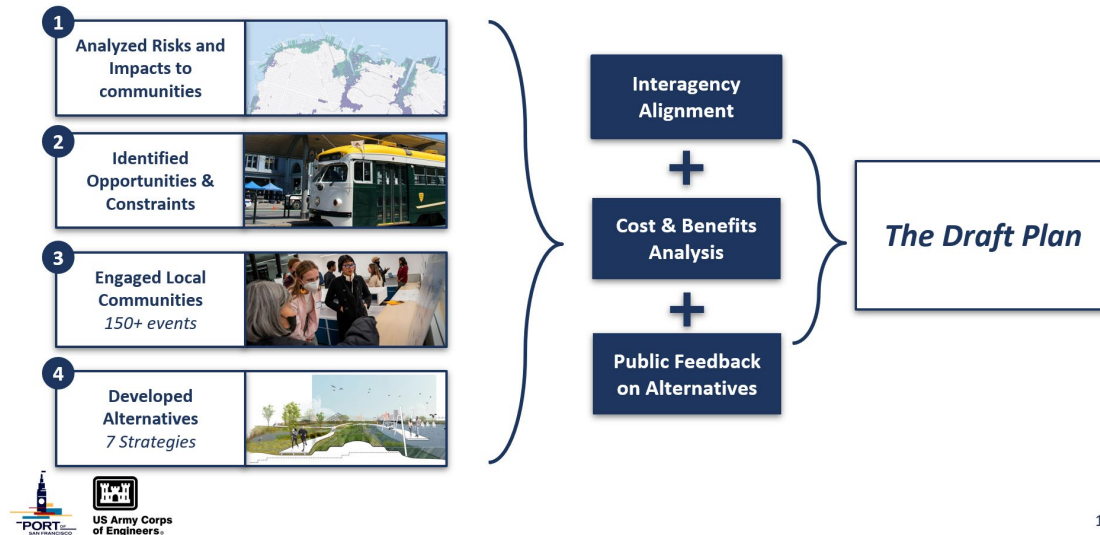
The USACE and City team developed high-level cost estimates and evaluated benefits using the metrics listed above. Using this information, the team selected a National

Economic Development (NED) Plan for a low, medium, and high sea level rise scenario. The NED Plan is the plan that maximizes the federal interest from a national economic development standpoint. That is, the NED plan has the highest ratio of NED benefits to costs.

Per USACE guidance, the Project Team also developed a Total Net Benefits Plan (TNBP). The Total Net Benefits Plan seeks to maximize benefits across the four USACE evaluation accounts, including the National Economic Development (NED), Regional Economic Development (RED), Other Social Effects (OSE), and Environmental Quality (EQ) accounts. For the Flood Study, the Total Net Benefits Plan was selected as the Draft Plan.

The Draft Report describes and analyzes the NED plans and TNBP (Draft Plan) and presents them for public review and discussion. The Draft Plan will be refined based on public and technical comments on the Draft Report. See Figure C-2: Process to Develop the Draft Plan.

**Figure E-2: Process to Develop the Draft Plan**





## **Exhibit F: Summary of Community Engagement**

The process of developing the Draft Plan builds off 5+ years of public outreach and engagement. Since 2017, the WRP has connected with tens of thousands of San Franciscans through community meetings, event tabling, waterfront boats, bike, and walking tours, mixers, online engagement like surveys and mapping exercises, and much more. Community input has helped the WRP develop its guiding vision, principles, goals, and evaluation criteria. The community has also shared what waterfront assets are key priorities as the WRP takes action to reduce seismic and flood risks.

Community feedback has strongly affirmed the Port's key focus on life safety and disaster response. The WRP heard "put people first" loud and clear. The assets and services most prioritized are housing, disaster recovery facilities, utilities, and businesses. Community members also shared a key focus on protecting transportation assets.

Public outreach and engagement on the Draft Waterfront Adaptation Strategies were conducted from mid-October to early December 2022. This outreach introduced the Draft Strategies, shared how they were informed by previous community feedback, and sought to understand public sentiment and priorities in response to the Draft Strategies.

Engagement and outreach included eight online community meetings, two in-person events in the Southern Waterfront, a series of walking tours in each waterfront geography (Embarcadero, Mission Bay/Mission Creek, and Islais Creek/Bayview), focus groups, presentations to targeted Community Based Organizations, and presentations to Community Advisory Committees. There was a total of 16 public engagement events with over 500 participants, 3,000 webpage views, and over 170,000 people who viewed content related to the Draft Strategies, including social media ads.

### **DEMOGRAPHIC BREAKDOWN OF COMMUNITY ENGAGEMENT**

Outreach focused on ensuring Southern Waterfront residents were aware of and in attendance at events. In addition to the two virtual community meetings and two walking tours that were hosted in each geography, the Port hosted two in-person events in the Southern Waterfront providing additional engagement opportunities for community members in this geography. This is reflected by the higher percentage of registered participants from the Southern Waterfront (24%) as compared to the Central and Northern Waterfront combined (17%).

Broad citywide outreach was effective, resulting in 41% of registered participants to events coming from non-Port-waterfront adjacent neighborhoods throughout San Francisco. A large percentage of registered participants (18%) live outside the City despite no dedicated outreach to these areas. This indicates an interest in the WRP from the broader Bay Area, likely due to working or frequently visiting the San Francisco waterfront.

Phase B outreach for events resulted in higher percentages of engagement from some priority populations than in the previous round of engagement for the Program (Phase A

Summer Survey). People identifying as Black/African American represented 14% of registered participants and people identifying as Asian/Pacific Islander represented 18%. The percentage of people identifying as Latino/a who registered for events (3%) was lower than engagement in previous rounds but higher for interest in participating in focus groups (16%).

The data below is pulled from Eventbrite registration data. It shows who registered to attend events, not necessarily who attended. It does not include participants who attended events without registering or attendees at non-public facing events (Focus Groups, CBO share-out presentations, CAC meetings).

**Figure F-1. Demographic Breakdown of Registered Participants to Public Events**

<b>What Neighborhood Do You Live In?</b>			
	<b>Count</b>	<b>Total</b>	
Northern Waterfront	46	548	8%
Southern Waterfront	141	548	24%
Central Waterfront	49	548	9%
Other SF Neighborhoods	216	548	41%
East Bay, North Bay, Peninsula	96	548	18%

What Is Your Race or Ethnicity?					
	Count	Total	Phase B Events	Phase B Focus Group Interest	Phase A Survey (Summer 2022)
American Indian/Native Alaskan	2	548	< 1%	<1%	<1%
Asian/Pacific Islander	97	548	18%	26%	16%
Black/African American	76	548	14%	10%	3%
Latino/a	19	548	3%	16%	6%
White/Caucasian	218	548	40%	34%	63%
Multiple Ethnicities	34	548	6%	5%	4%
Other/Prefer Not to Say	102	548	19%	<1%	7%

## WHAT WE HEARD

We heard the following general comments and feedback:

- Waterfront-wide, community members indicated that flooding around where they live and work, impacts to community safety, and disruption to transportation or waterfront access are their top sea level rise-related concerns.
- Community members support a strategy that defends against higher projected rates of sea level rise.
- Nature-based approaches and improved public access to the waterfront remain a high priority for community members, no matter the strategy.
- Overall, there was no strong preference for any one strategy over another among the strategies that address a higher rate of sea level rise, though participants identified pros and cons for each of the strategies.
- Community members raised many concerns in response to the draft strategies. Common concerns included concerns about equity and environmental justice, technical practicalities, and questions about cost and feasibility.

## Exhibit G: Draft Report Executive Summary

## Exhibit H: Glossary of Terms

**Draft Integrated Feasibility Report and EIS (Draft Report):** Report that will be released for public feedback that will describe the TSP, project costs, project benefits, and environmental impacts

**Draft Waterfront Adaptation Strategies (Draft Strategies):** Alternatives that describe different approaches to adapting the San Francisco waterfront to coastal and inland flooding and seismic hazards. Will be used to develop and identify the Draft Waterfront Adaptation Plan.

**Early Projects:** Early actions to address the areas of highest earthquake and sea level rise risks along the Embarcadero and Southern Waterfront. They are near-term actions, focused on improving life safety and citywide disaster response capabilities, and are the first step toward building long-term, waterfront-wide resilience.

**Environmental Impact Statement (EIS):** Document that analyzes environmental impacts under NEPA.

**National Economic Development Plan (NED):** The NED Plan is the plan that maximizes the federal interest from a national economic development standpoint. That is, the NED plan has the highest ratio of NED benefits to costs.

**National Economic Policy Act (NEPA):** Federal law that requires federal environmental review.

**Pre-Construction Engineering and Design (PED):** Project phase that includes detailed design and engineering, implementation, and phasing.

**Tentatively Selected Plan (TSP or Draft Plan):** USACE term for the Draft Waterfront Adaptation Plan that would be the basis of congressional funding request – may be selected from the NED Plan, TNBP, or LPP.

**Total Net Benefits Plan (TNBP):** The Total Net Benefits Plan seeks to maximize benefits across the four USACE evaluation accounts, including the National Economic Development (NED), Regional Economic Development (RED), Other Social Effects (OSE), and Environmental Quality (EQ) accounts.

**United States Army Corps of Engineers (USACE):** Federal agency responsible for flood management projects.

**Waterfront Resilience Program (WRP):** The Port of San Francisco program to take action to address actions to reduce seismic and climate change risks that support a safe, equitable, sustainable, and vibrant waterfront.

**San Francisco Flood Study (Flood Study):** A partnership between USACE and the City of San Francisco, with the Port as the lead agency, to develop a feasibility analysis of flood hazards and potential actions to address flood and seismic damages, which will result in a recommendation for funding to U.S. Congress.