



RECOMMENDED PLAN HIGHLIGHTS



SAN FRANCISCO WATERFRONT FLOOD STUDY
AUGUST 2026



US Army Corps
of Engineers®

U.S. Army Corps
of Engineers



Port of San Francisco
Pier 1
The Embarcadero
San Francisco, CA

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CMG Landscape Architecture

Pathways Climate Institute

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August 2026

Land Acknowledgment:

The Port of San Francisco acknowledges that we are on the unceded ancestral homeland of the Ramaytush Ohlone who are the original inhabitants of the San Francisco Peninsula.

As the indigenous stewards of this land and in accordance with their traditions, the Ramaytush Ohlone have never ceded, lost nor forgotten their responsibilities as the caretakers of this place, as well as for all peoples who reside in their traditional territory.

As guests, we recognize that we benefit from living and working on their traditional homeland.

We wish to pay our respects by acknowledging the Ancestors, Elders and Relatives of the Ramaytush Community and by affirming their sovereign rights as First Peoples.

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Official Term

U.S. Army Corps of
Engineers or USACE

San Francisco Waterfront
Coastal Flood Study, CA

Draft Integrated Feasibility
Report and Environmental
Impact Statement

Tentatively Selected Plan

Final Integrated Feasibility
Study and Environmental
Impact Statement

Shortened Term

USACE

**San Francisco Waterfront
Flood Study (The Flood Study)**

Draft Report

Draft Plan

Final Report

Image Credit: Port of San Francisco

An aerial photograph of San Francisco at sunset. The city's skyline is visible, with numerous skyscrapers and buildings illuminated by the warm light of the setting sun. The Golden Gate Bridge is visible in the foreground, spanning the water. The sky is filled with soft, colorful clouds in shades of orange, pink, and purple. The water in the foreground is dark and calm.

1 *Introduction*

1.1 DEFENDING SAN FRANCISCO AGAINST SEA LEVEL RISE AND EARTHQUAKES

The **San Francisco Waterfront Flood Study** is a multi-year effort led by the U.S. Army Corps of Engineers in collaboration with the City of San Francisco. USACE and the City have reached an important milestone - the release of the **Recommended Plan**, which proposes where, how high, and how expensive it will be to build coastal flood defenses that will manage sea level rise for the next century.

Image Credit: Port of San Francisco

What is the Recommended Plan?

The Recommended Plan is a proposal combining different flood defenses, such as floodproofing, seawalls, berms/levees, floodwalls, and nature-based features, which could be used to defend our waterfront and identify their proposed locations, typical engineering measures, benefits, costs, and impacts. The Recommended Plan evolved from the best ideas, approaches, and public input from the Draft Plan, released for public review in 2024. The proposed solutions are estimated to cost \$17.8 billion in 2026 dollars, and, if approved by Congress, the Federal government may pay up to 65% of the construction cost. The Recommended Plan includes an Implementation Strategy for how to build the project in phases over time and a Monitoring and Adaptation Plan to track evidence of changing hydrologic and meteorologic conditions that will trigger future adaptation actions. The Recommended Plan will inform subsequent stages of planning and design to develop targeted construction projects.



The Flood Study is led by USACE in collaboration with the City of San Francisco, with the Port as lead agency. The Port worked closely with other City agencies through ClimateSF to inform the Draft Plan.

Figure 1.1: Flood study collaboration

Why is this an important milestone?

Reflecting more than eight years of community engagement and public input, the Recommended Plan is a critical milestone in San Francisco’s ongoing, long-term efforts to defend our waterfront against coastal flood risk and sea level rise, while also enhancing the seismic stability of our waterfront’s flood management structures and complementing waterfront improvements. The Recommended Plan represents the last technical step in the USACE feasibility study process prior to signing by the USACE Chief of Engineers and authorization by Congress.



Figure 1.2: Character of San Francisco’s waterfront

What's at Risk: Potential Sea Level Rise by 2100

San Francisco's waterfront location makes it extremely **vulnerable to coastal flooding** due to **sea level rise**

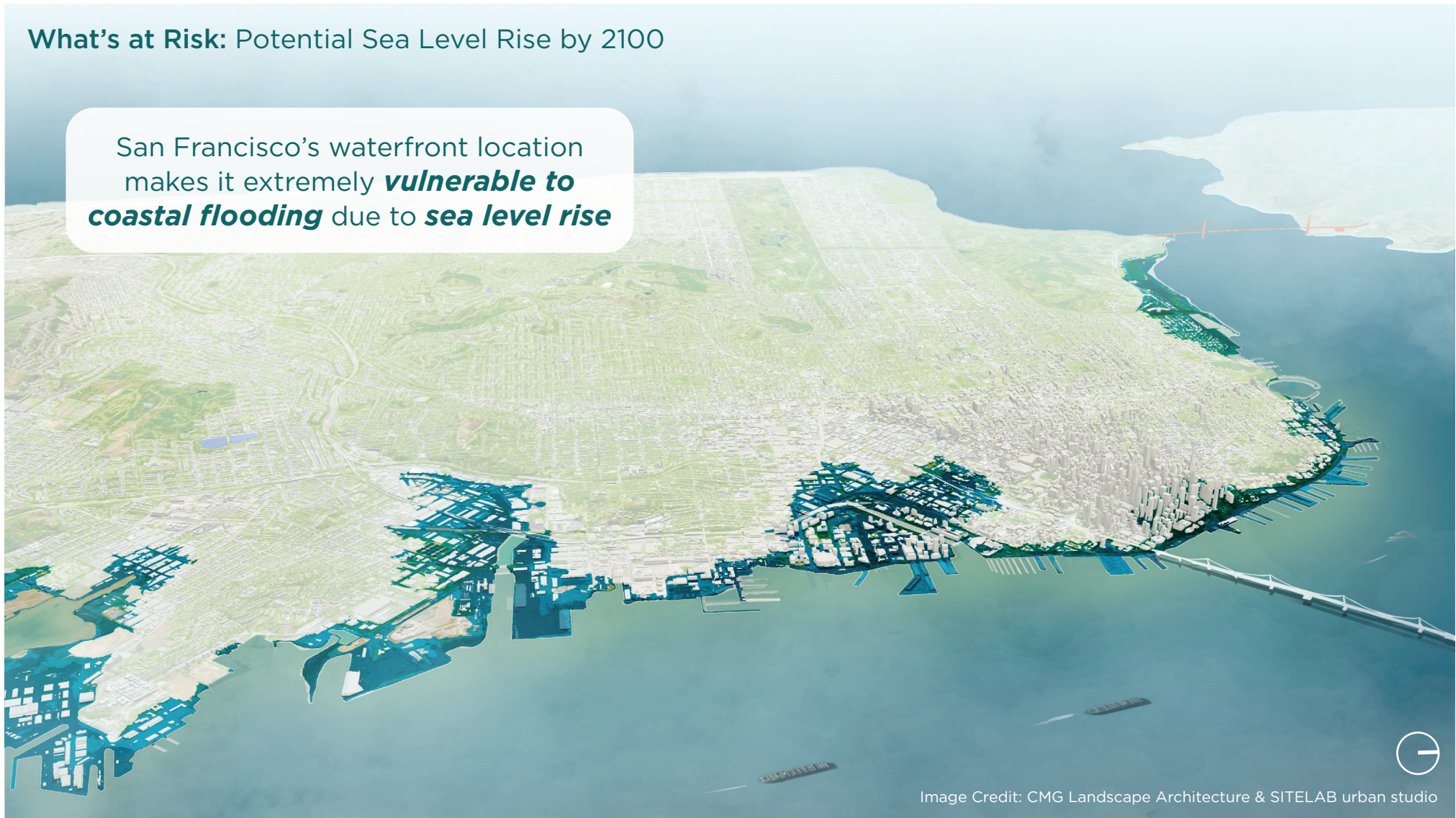


Figure 1.3: Potential sea level rise by 2100

- 1.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE
- 3.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE

1.2 WHAT'S AT RISK?

We are experiencing the impacts of global climate change around the world and here in the Bay Area. San Francisco faces coastal flood risks today. To defend San Francisco against current and future flood risk, as shown in Figure 1.3, there is a need to adapt shoreline elevations to withstand sea level rise.

These flood risks will increase in the future due to sea level rise and extreme storms, threatening buildings; housing; businesses and industries; jobs; parks and open space; water, gas, electric, and sewer infrastructure; and critical transit such as BART and Muni. Some low-lying areas already experience flooding during extreme storms today.

Model simulations suggest that, without Federal action, 100 to 500 structures and assets will be vulnerable to flooding by 2050. By 2140, cumulative flood damages and loss of waterfront property could exceed \$23 billion.

Without a federal action, by 2140, damages from coastal flooding could amount up to **\$23 billion**



Figure 1.4: Flooding in Islais Creek during a recent storm event



Figure 1.5: Flooding of Embarcadero during a recent storm event

1.3 HOW SAN FRANCISCO IS ADDRESSING THOSE RISKS

The Flood Study is one piece of the City's efforts to increase resilience to waterfront hazards, including earthquakes, coastal flooding, and sea level rise. The Port is engaged on multiple fronts to work towards a more resilient waterfront and improved Port assets. Ongoing Port efforts include [Projects](#) (near-term actions focused on improving life safety and citywide disaster response capabilities, and delivering initial Recommended Plan segments) and public-private development partnerships to adapt piers, wharves, and seawall lots. The Flood Study is a crucial piece of the Port's resilience puzzle with the potential for significant federal funding for waterfront resilience. It must be coordinated with the Port's other resilience, economic development, capital improvement, and maintenance activities.

Other San Francisco agencies are working to develop strategies to address coastal flood risk, as shown in Figure 1.6. Projects include the San Francisco Shoreline Adaptation Plan, Yosemite Slough Adaptation Strategy, India Basin Shoreline Park, Ocean Beach Climate Change Adaptation Project, and public-private development projects such as Mission Rock, Pier 70, and Potrero Power Station.

How San Francisco is Addressing those Risks

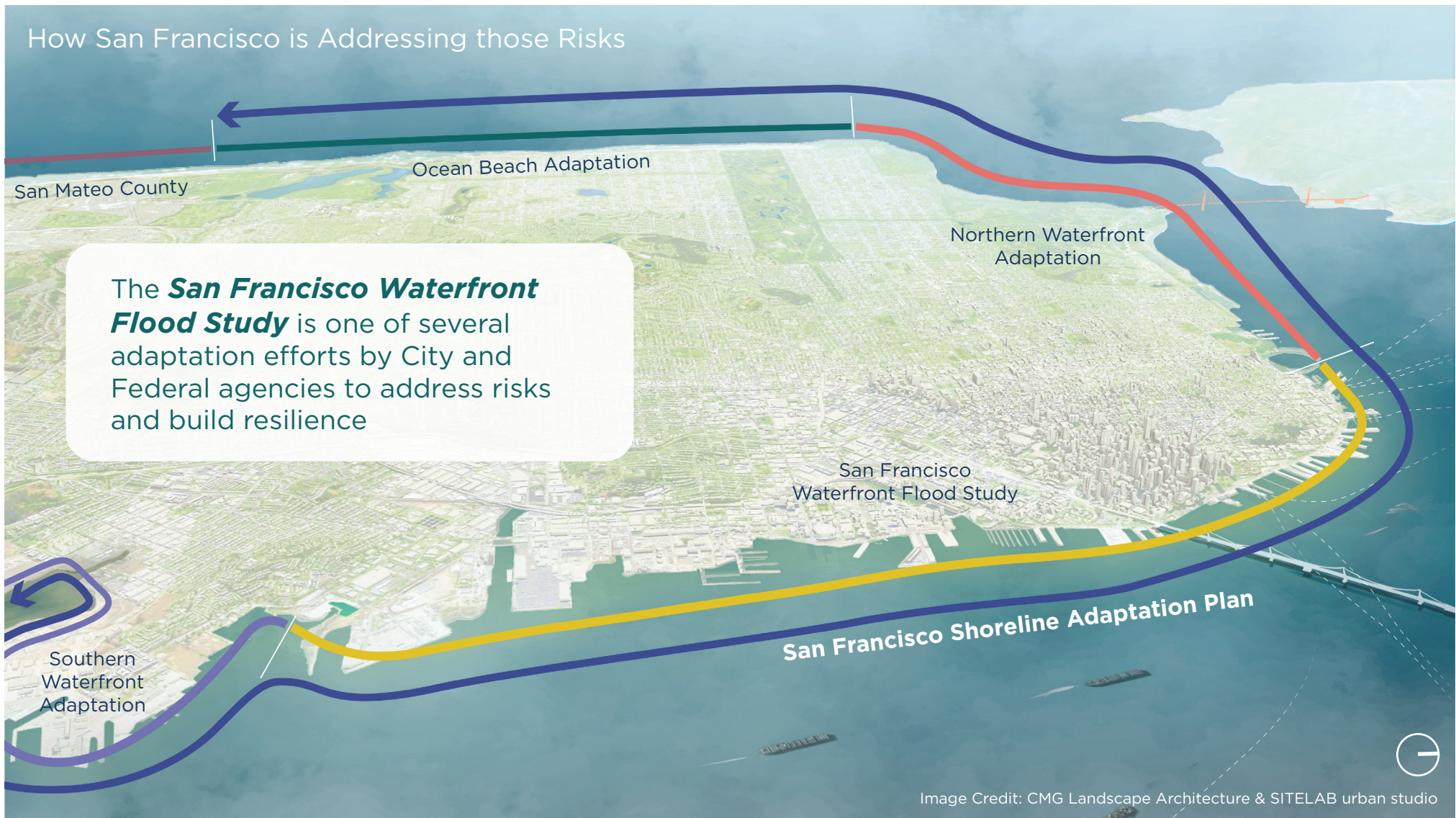


Figure 1.6: San Francisco adaptation efforts



2 *About the Flood Study*

2.1 THE SAN FRANCISCO WATERFRONT FLOOD STUDY

The Flood Study analyzes coastal flood risk and effects of sea level rise to the San Francisco waterfront along the Port's 7.5-mile jurisdiction over the next 100 years.

Image Credit: Port of San Francisco

2.2 WHERE ARE WE IN THE FLOOD STUDY PROCESS?

The Flood Study analyzes the coastal flood risk and effects of sea level rise within the Port of San Francisco’s jurisdiction, from Aquatic Park to Heron’s Head Park. On January 26, 2024, USACE and the City published the Draft Plan, followed by public outreach and comment.

Over the last two years, the Project Team refined the Draft Plan to incorporate comments and create a Recommended Plan. The Recommended Plan was published in the Federal Register with a public Notice of Availability on July 31, 2026. Following publication, the Project Team will continue to advance design and construction of the plan and individual plan segments.

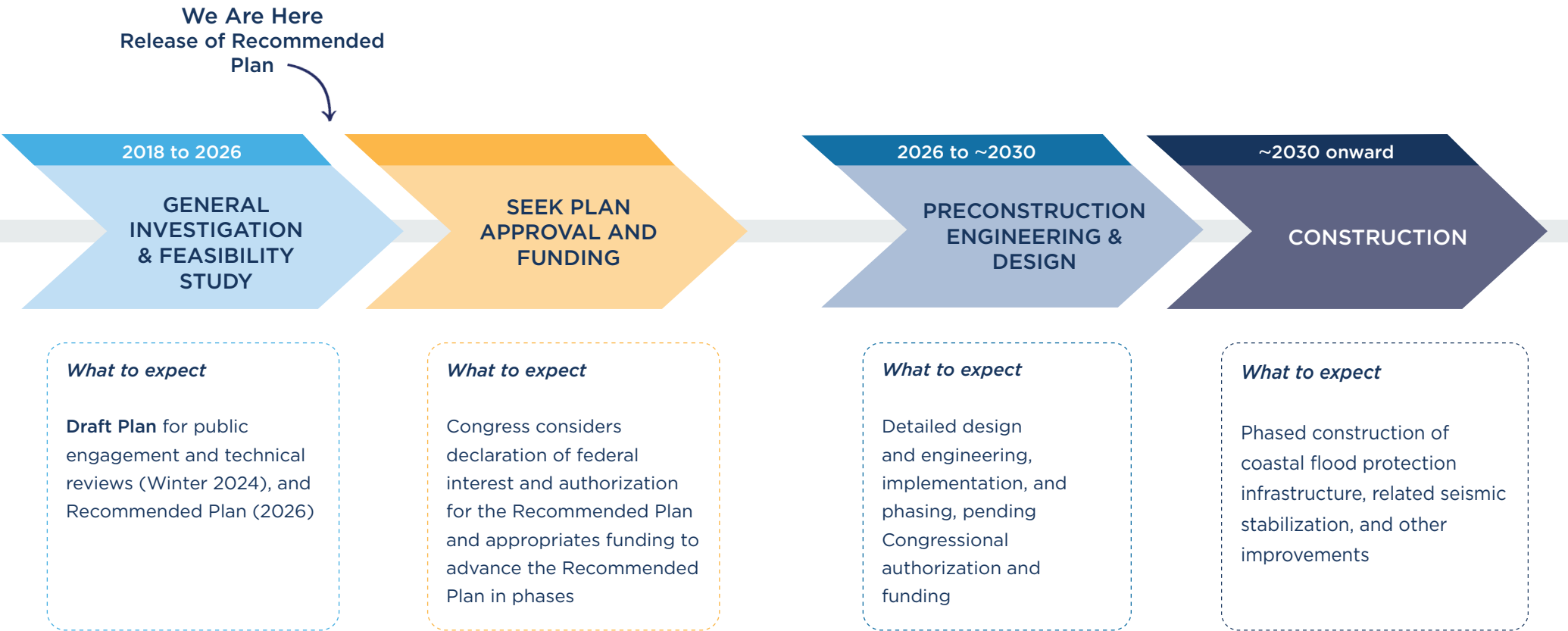


Figure 2.1: Flood study process

Note: Dates are approximate and subject to change. Projects will occur in phases.

2.3 WHAT'S INCLUDED IN THE RECOMMENDED PLAN?

The Flood Study's boundary includes the 7.5 miles of Port of San Francisco jurisdiction shoreline indicated - a substantial piece of our city's waterfront and home to some of our city's most beloved landmarks, public attractions, and open spaces. The waterfront is also integral to our city's economic activity, transportation networks like BART and Muni, critical drinking water and wastewater utilities, and disaster response facilities. What happens along the San Francisco waterfront will impact San Franciscans in every corner of the city and region.

The Recommended Plan is one component of the Flood Study and indicates approximately where to build flood defenses, how high to build flood defenses, how much space to use, typical engineering measures, as well as project benefits, costs, and impacts.

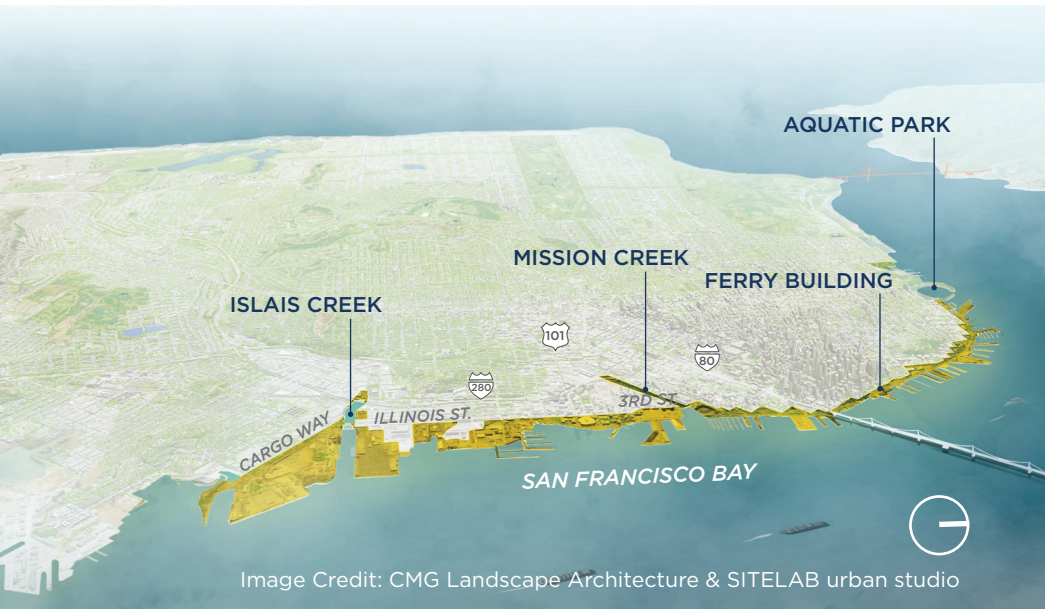
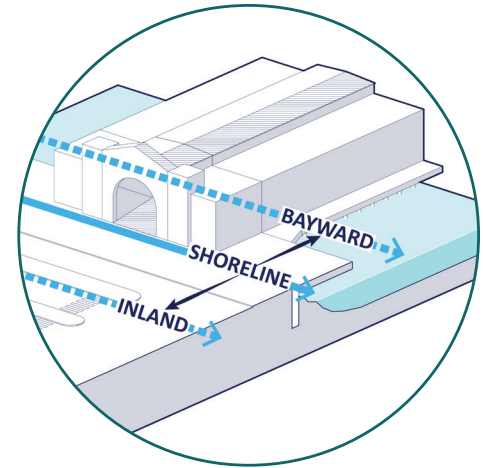


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 2.2: Port of San Francisco jurisdiction

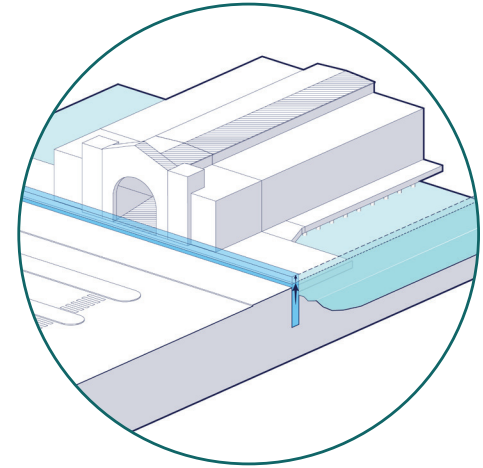
Where to build flood defenses?

Have we located the flood defense 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.

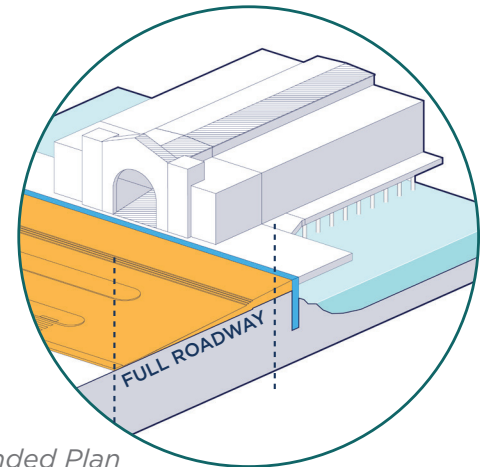


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 2.3: What is in the Recommended Plan

2.4 HOW DID WE DEVELOP THE RECOMMENDED PLAN?

The Recommended Plan is informed by understanding risks, opportunities and constraints, a detailed benefit-cost analysis, and public feedback. The Draft Plan was released for public review in 2024. Public feedback, additional technical analysis and review, and evaluation of benefit-cost trade-offs influenced the development of the Recommended Plan, the USACE/City proposal for how to defend the San Francisco waterfront from coastal flooding for the next 100 years.

Environmental consequences of the Recommended Plan have been assessed in the National Environmental Protection Act Environmental Impact Statement.

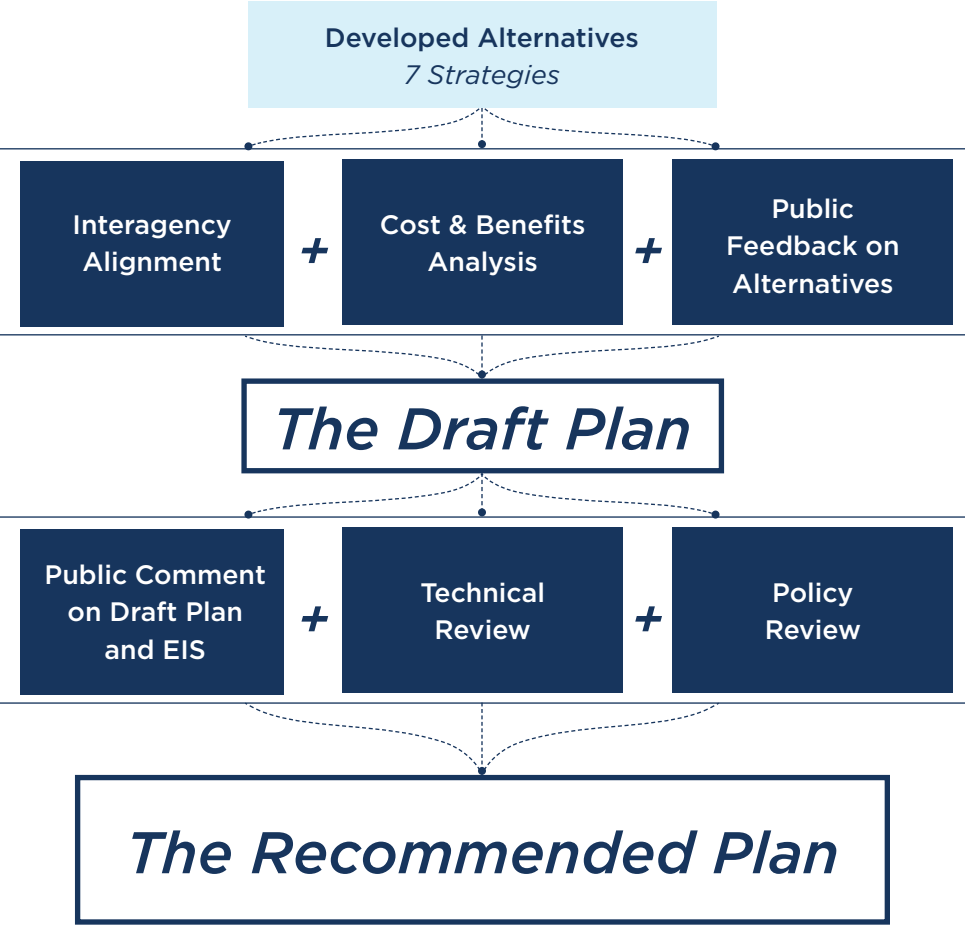


Figure 2.4: Recommended Plan development process

A Comprehensive Benefit-Cost Analysis

The Flood Study is the first USACE mega-study on the West Coast, making the Recommended Plan part of a landmark investment in the country’s large-scale resilience planning efforts. This work, places USACE and San Francisco as national leaders in resilience planning.

For the first time in a study like this, the Recommended Plan accounts for economic, social, and environmental benefits and impacts. These benefits are factored into the evaluation and selection of the coastal flood defense alternatives.

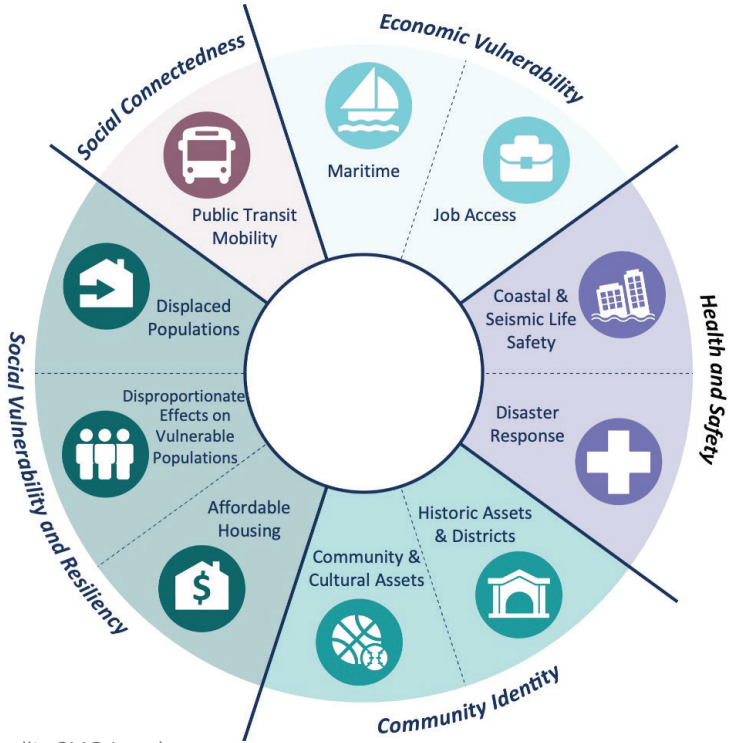


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 2.5: Other social effects (USACE Analysis) data included in the selection process

2.5 PHASED ACTIONS THAT ARE ADAPTABLE OVER TIME

If authorized and funded by Congress, the Recommended Plan will be designed and built in phases over multiple decades, building on additional waterfront improvements and investments, starting by addressing the areas of greatest flood risk.

The Recommended Plan includes an Implementation Strategy, which aims to deliver projects as efficiently as possible, minimize disruption, and maintain waterfront access. The Implementation Strategy includes a phasing approach, Early Resilience Actions, and a Monitoring and Adaptation Plan.

The phasing approach identifies subreaches that can be built over time and factors to consider how each area should be prioritized, driven by coastal flood risk and influenced by other factors such as construction disruption in a given area reach, age and condition of City assets, cost and engineering complexity, geographic distribution, and funding availability. Subreach boundaries will be refined in subsequent project phases.

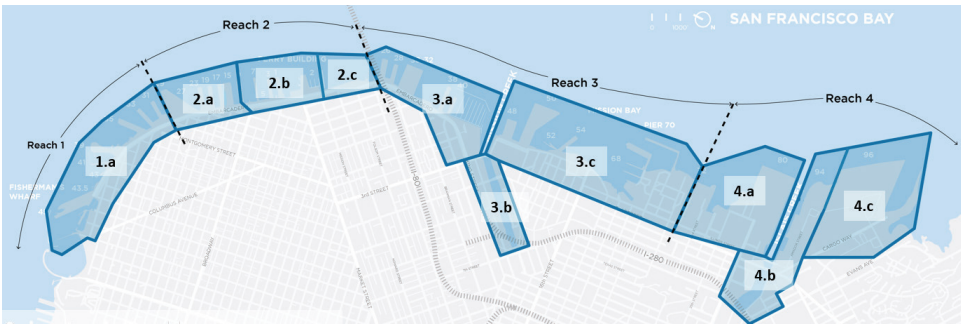


Figure 2.7: Subreaches

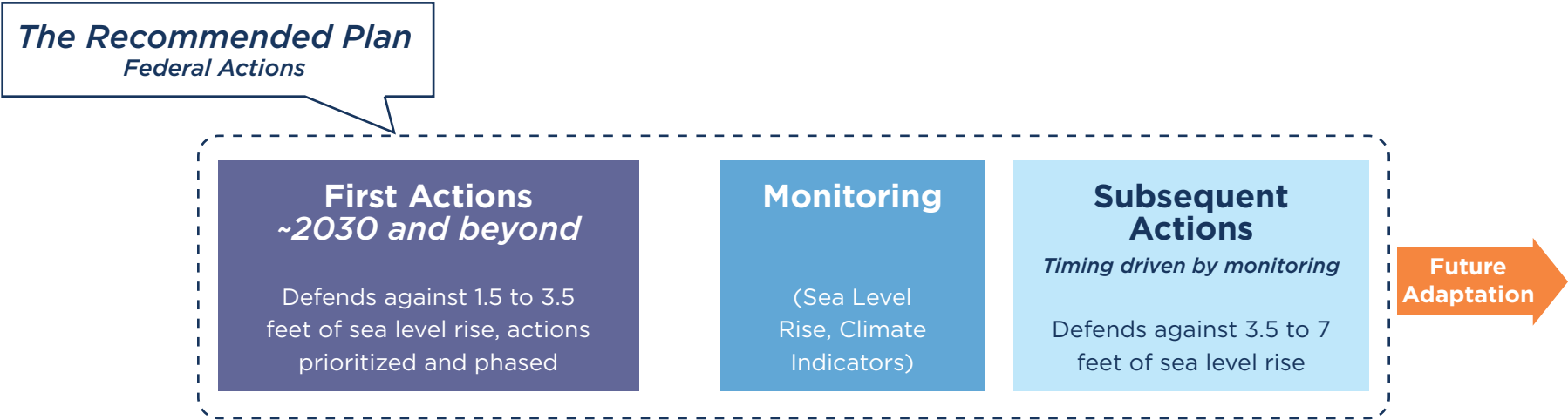


Figure 2.6: Adaptation phasing

Early Resilience Actions

The Recommended Plan identifies Early Resilience Actions, or areas to start construction based on near-term flood risk, including the area around Rincon Park and portions of the Mission Creek, Mission Bay, and Islais Creek shorelines. The Monitoring and Adaptation Plan proposes a process to track hydrologic and meteorologic indicators and sea level rise over time and recommend when later adaptations are needed to defend the city against higher sea levels.

2.6 WHAT IS NOT IN THE RECOMMENDED PLAN?

What's not being decided at this stage?

The Recommended Plan does not include the following:

- ▮ Detailed designs for flood defenses
- ▮ Designs for waterfront streets, open spaces, and infrastructure
- ▮ Timing and sequencing of construction
- ▮ Funding plan

These elements will be refined in subsequent phases.

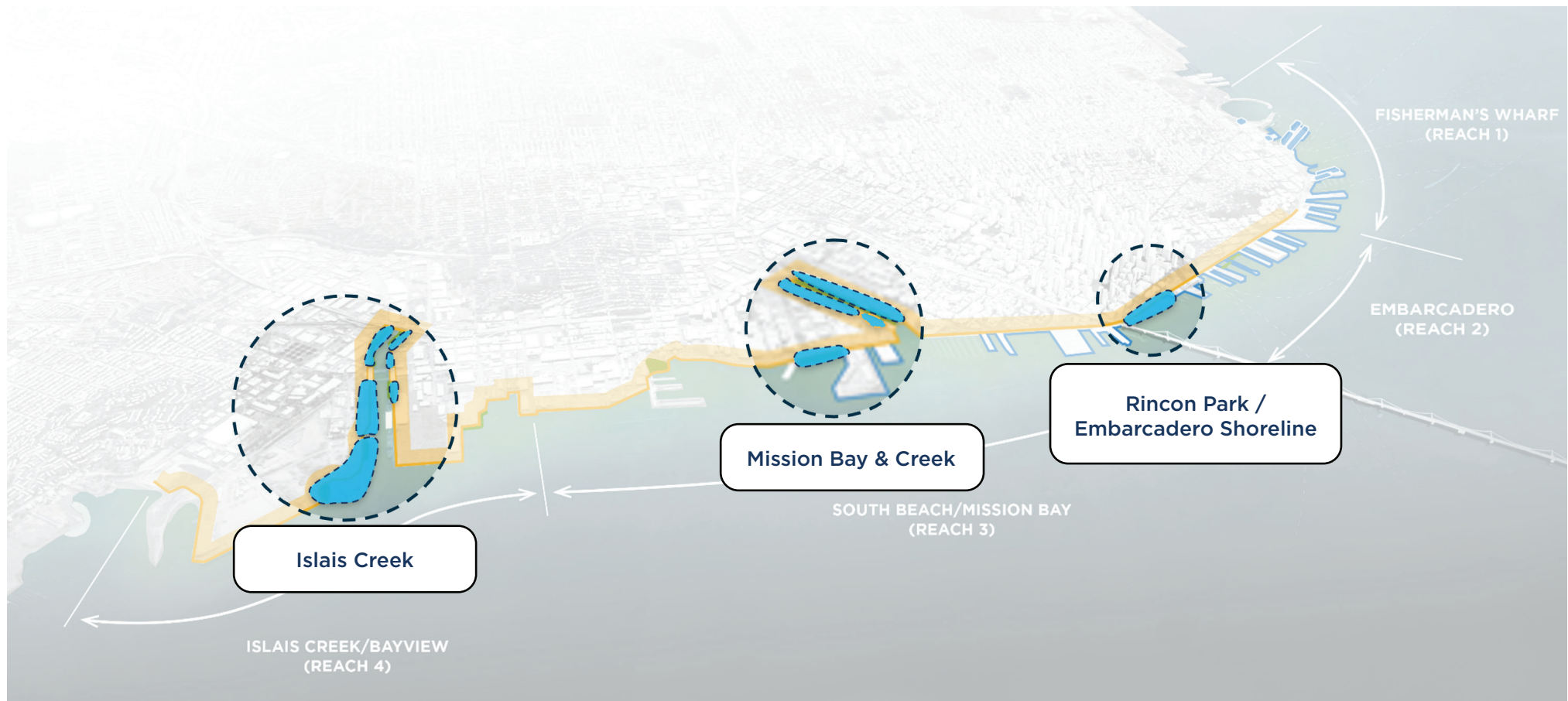


Figure 2.8: Areas of Higher Near-Term Flood Hazard and Candidate ERAs



Image Credit: Port of San Francisco

A CATALYST FOR A MORE RESILIENT SAN FRANCISCO

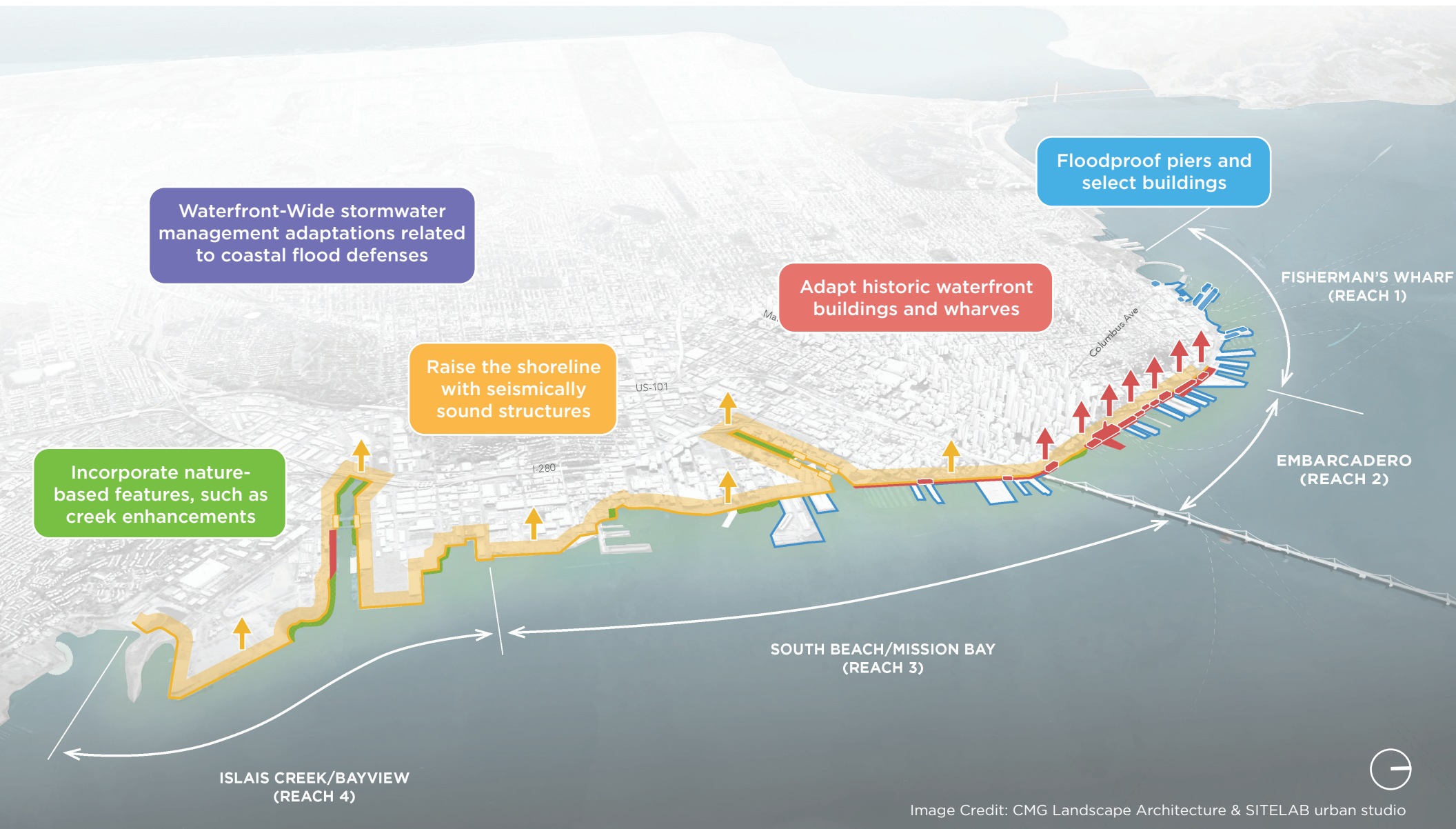


Figure 3.1: The Recommended Plan

3.1 A CATALYST FOR A MORE RESILIENT SAN FRANCISCO

The Recommended Plan is a once-in-a-century opportunity to:

- Defend communities, assets, and infrastructure against coastal flooding
- Stabilize the shoreline to improve earthquake safety of coastal flood defenses
- Invest in a great public waterfront along with flood defense projects
- Safeguard resilient transit and utility networks
- Secure funding through collaboration with the Federal government
- Adapt historic and cultural resources to climate change

3.2 THE RECOMMENDED PLAN

The Recommended Plan consists of **five broad categories of actions**, totaling **13 actions**, applied across the waterfront.

13 Recommended Plan Actions

Raise the shoreline with seismically sound structures

1. Raise the shoreline to defend against 1.5' to 3.5' of sea level rise
2. Stabilize the shoreline with ground improvements to ensure coastal flood defenses perform as required during an earthquake
3. Construct closure structures on the bridges/tie into the existing bridge project

Adapt historic waterfront buildings and wharves

4. Elevate historic buildings like the Ferry Building and bulkhead buildings
5. Replace existing wharves with new seismically-resilient, elevated wharves

Floodproof piers and select buildings

6. Floodproof select buildings in Fisherman's Wharf
7. Construct 2-foot-tall walls around the perimeter of the piers

Incorporate nature-based features

8. Incorporate living seawall concepts into newly constructed seawalls
9. Create coarse beaches and rocky intertidal habitat
10. Build vegetated berms/levees
11. Preserve and enhance wetlands

Stormwater management adaptation related to coastal flood defenses

12. Adapt infrastructure to manage stormwater related to coastal flood defenses
13. Build green infrastructure

Figure 3.2: 13 Recommended Plan actions

3.3 PUBLIC FEEDBACK

The development of the Recommended Plan incorporated over eight years of public input and rigorous technical analysis. The Port has connected with tens of thousands of community members through over 250+ events to understand community priorities and concerns. The release of the Recommended Plan marks a major milestone in the Waterfront Resilience Program. Below are some of the highlights that we heard from the community, prior to, during, and after the release of the draft plan that helped to shape the Recommended Plan:

Put people first, prioritize assets and services



Defends all housing and jobs - 23,000 residents and 3,000 jobs at risk in the project area

Defends critical services people depend on, such as utilities and transportation

Preserves nearly 80 cultural and community assets

Considers mitigation to minimize construction impacts and disruption to the community, including Port tenants, businesses, and surrounding neighborhoods

Image Credit (for all): Port of San Francisco

Consider Vulnerable Communities

Sea level rise risks disproportionately impact historically underserved communities, and the Port is working to ensure that the Recommended Plan creates opportunities for these communities to engage in decision-making and benefit directly through inclusive public engagement, job opportunities, and neighborhood improvements.

Community members emphasized a desire for the City to develop plans and projects to protect the whole San Francisco shoreline, including areas north and south of the Recommended Plan area. In response to these comments, the City of San Francisco has completed the Yosemite Slough Neighborhood Adaptation Strategy and begun work on the San Francisco Shoreline Adaptation Plan, which will develop the citywide approach to shoreline adaptation across all San Francisco neighborhoods.

Focus on life safety and emergency response



Proposes 7.5 miles of integrated flood defenses

Upgraded flood defenses will be able to withstand a major earthquake

Reduces damages to disaster recovery facilities

Image Credit (for all): Port of San Francisco

Maintain, expand, and create new connections between the city and the waterfront



Maintains visual and physical connections to the Bay



Enables future opportunities to improve the public realm



Creates opportunities for water recreation and access

Image Credit (for all): Port of San Francisco

Prioritize nature and healing the Bay



Includes options for nature-based features like living seawalls, intertidal habitats, coarse beaches, and vegetated berms.

Creates opportunities to expand habitat in future iterations of the plan



Preserves and enhances existing wetlands

Addresses contamination on sites where the coastal flood defenses would be built (local responsibility)



Creates opportunities for multiple benefits, such as access to new open spaces

Image Credit (for all): Port of San Francisco

3.4 WHAT CHANGED FROM THE DRAFT PLAN?

The Flood Study team refined the Draft Plan based on public comment and technical review. Major changes from the Draft to the Recommended Plan include:

- ▶ Integration of natural features such as living seawalls, rocky intertidal habitat, coarse beaches, vegetated berms, and enhanced wetlands
- ▶ Temporary closure structures to close potential flood pathways at the end of the project
- ▶ Adjusted alignment to avoid impacts to historic resources
- ▶ Additional raised and rebuilt wharves at the Ferry Building and South Beach
- ▶ Additional floodproofing of buildings and infrastructure
- ▶ Changes to buildings that will be moved, elevated, or demolished, particularly at Islais Creek and Port maritime facilities

In addition to the changes in the project scope, the project team better defined the project with greater engineering detail, constructability consideration, and cost estimating to arrive at a 20% level of design. The updated cost estimate is \$17.8B (2026 dollars), which has received a Conditional Cost Certification by USACE.



Image Credit: Port of San Francisco

3.5 ACTIONS BY NEIGHBORHOOD

The flood defenses outlined in the Recommended Plan are based on the different conditions and risks of four neighborhood areas of the waterfront, also known as “Reaches.”

Defining these Reaches makes it easier to combine strategies in ways that meet the unique conditions and different flood risks of the waterfront while providing continuous coastal flood defenses.

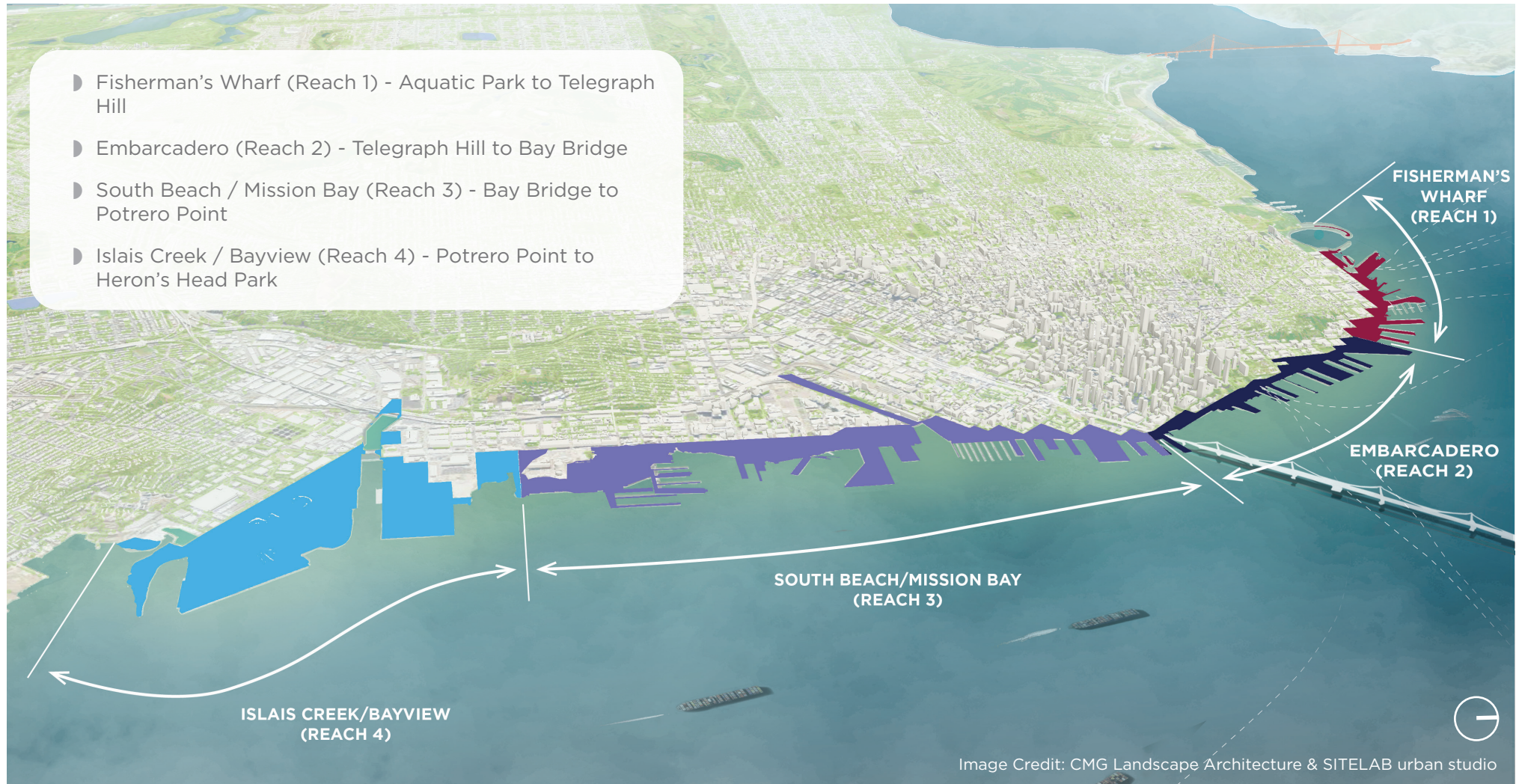


Figure 3.3: Waterfront wide reach boundaries

Fisherman's Wharf

Fisherman's Wharf is located in a higher, more protected area that will encounter lower flood damage than other areas of the waterfront. The Recommended Plan in Fisherman's Wharf takes advantage of the existing higher ground and recommends floodproofing and short floodwalls on piers and wharves as first actions to reduce damage to lower-lying buildings and assets.

Floodproofing is a more targeted approach. It focuses on reducing damage in the near-term to a particular asset or building. Floodwalls often extend above the ground surface - up to 3 feet.

Floodproofing is recommended because it:

- Minimizes disruption from construction, especially to public transit and businesses, until higher flood risks are evident
- Provides a more cost-efficient way to reduce near-term damages where there are lower flood risks based on sea level rise modeling
- Defends and preserves historic and maritime resources
- Ensures public access to the waterfront and historic places and an inviting waterfront for all
- Enhances and sustains economic opportunities

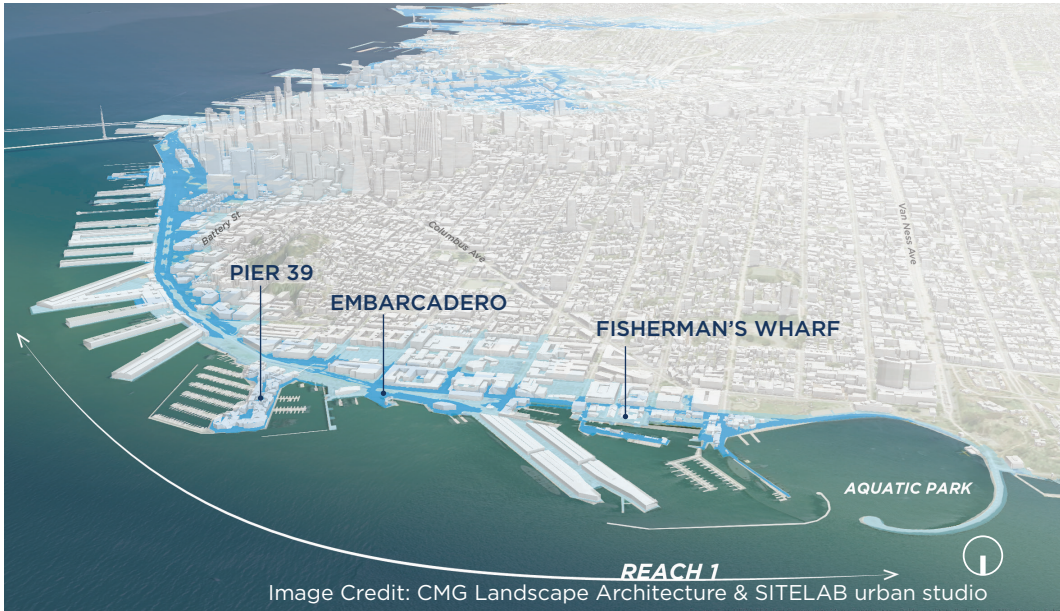


Figure 3.4: Fisherman's Wharf potential sea level rise by 2100

- 1.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE
- 3.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE

First Actions

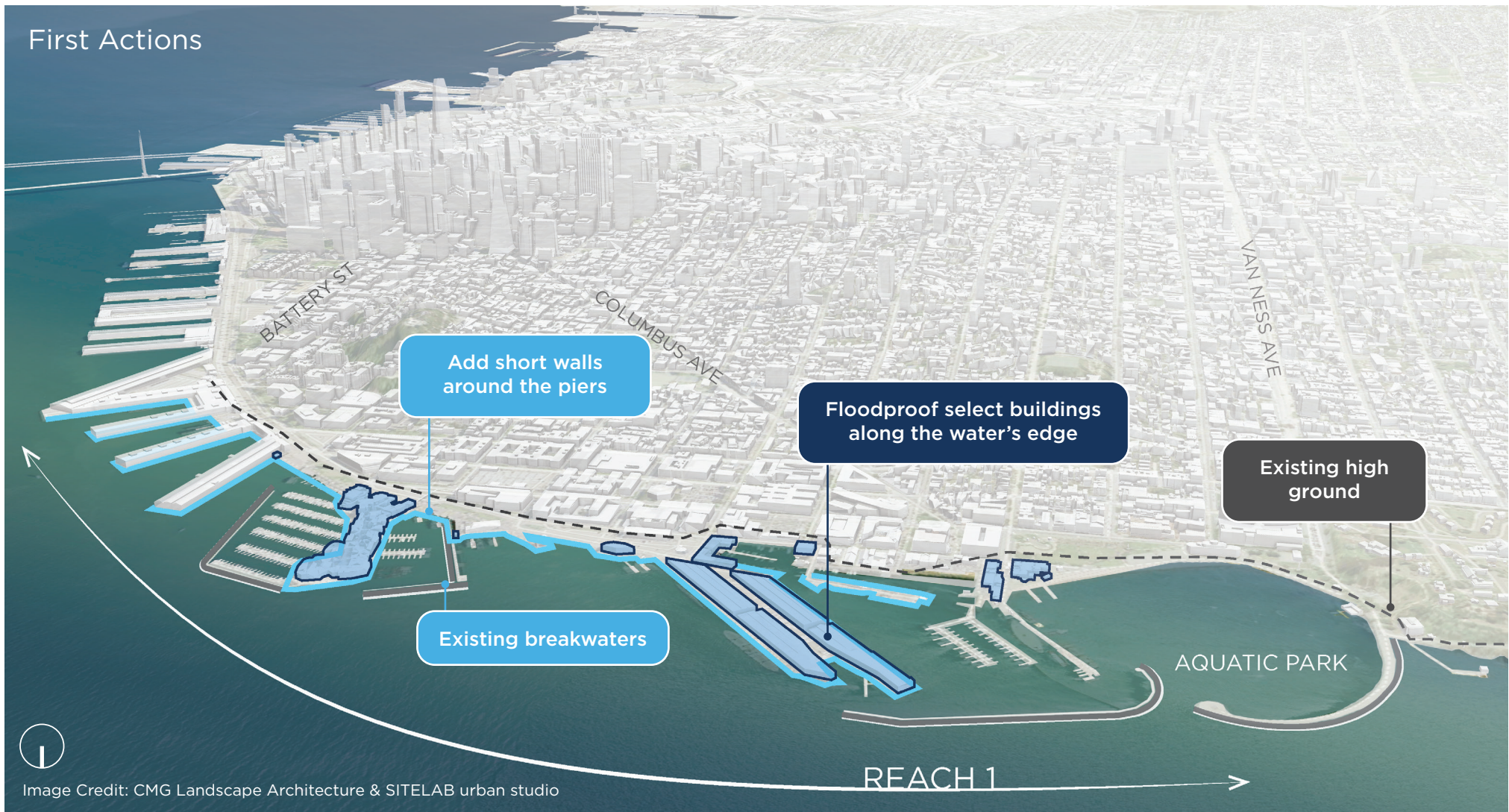


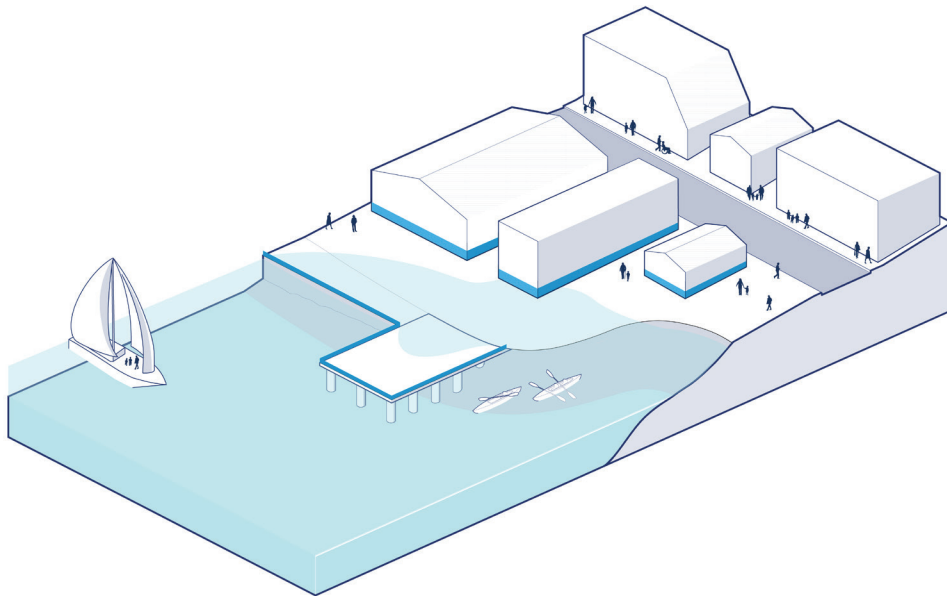
Figure 3.5: Fisherman's Wharf Recommended Plan

Floodproof select buildings

Some facilities can be modified to keep water out entirely, while others can be modified on the inside to allow water to enter and exit the facility, causing little or no lasting damage.

Add Short Walls Around Piers

Build up to two-foot walls around piers to manage flood risks & defend against intermittent high water.



- FLOODWALL
- ASSET LEVEL FLOOD PROOFING

Figure 3.6: Fisherman's Wharf action explanation

1ST ACTIONS

Sea Level Rise Protection



Floodproofing to withstand **near-term** flood risk

Seismic Improvements



Not included in the Recommended Plan - partially addressed through other projects

Connection to the Waterfront



Visual and physical connections **maintained**, with 2' walls along piers

Asset and System Protection



At-risk buildings are protected. Transit and utility networks do not have near term risk

Nature-Based Features



No feasible options that also maintain maritime function in this geography

FISHERMAN'S WHARF FORWARD (not included in Flood Study)

Fisherman's Wharf Forward will create a new destination at the heart of Fisherman's Wharf and reconnect visitors to the Inner Lagoon. Long-term efforts will strengthen or replace the seawall and wharves. This project is not included in the Recommended Plan.

SUBSEQUENT ACTIONS (dependent on monitoring)

- Elevate the shoreline, wharves, and historic buildings
- Seismic ground improvements associated with coastal flood defenses
- Protect utility/transportation networks

The Embarcadero

The Recommended Plan in this section of the waterfront focuses on raising the seawall at the shoreline edge to defend against 3.5 feet of sea level rise. Seawalls are hardened structures placed along the shoreline. There would be a gradual transition, coupled with seismic ground improvements related to the flood defense project, to connect the shoreline to the existing city elevation across the Embarcadero, maintaining the city's connection to the waterfront. Design details for how this transition would work, as well as the design of the promenade and roadway, will be developed in later project phases.

The proposed elevation of the shoreline is higher in the Embarcadero because the dense concentration of city-serving and regional infrastructure - including critical disaster response assets and services - makes it more difficult to phase in coastal flood defenses incrementally.

The Recommended Plan proposes to raise buildings along the water's edge, including the Ferry Building and historic bulkhead buildings, and the Embarcadero roadway, and gradually transition them back to the existing city elevation to retain access to the Bay. The Recommended Plan includes natural features such as living seawalls and rocky intertidal habitat.

This approach is recommended because it:

- Prioritizes life safety and emergency response by defending the Ferry Building and the Embarcadero roadway, a key thoroughfare for delivering emergency supplies, staff, and services
- Defends and preserves historic and maritime resources
- Ensures public access to the waterfront and historic places and an inviting waterfront for all, including future opportunities to increase the connection between the Ferry Building, waterfront, and Market Street
- Includes nature-based infrastructure that enhances habitat.



Image Credit: Port of San Francisco



Image Credit: Port of San Francisco

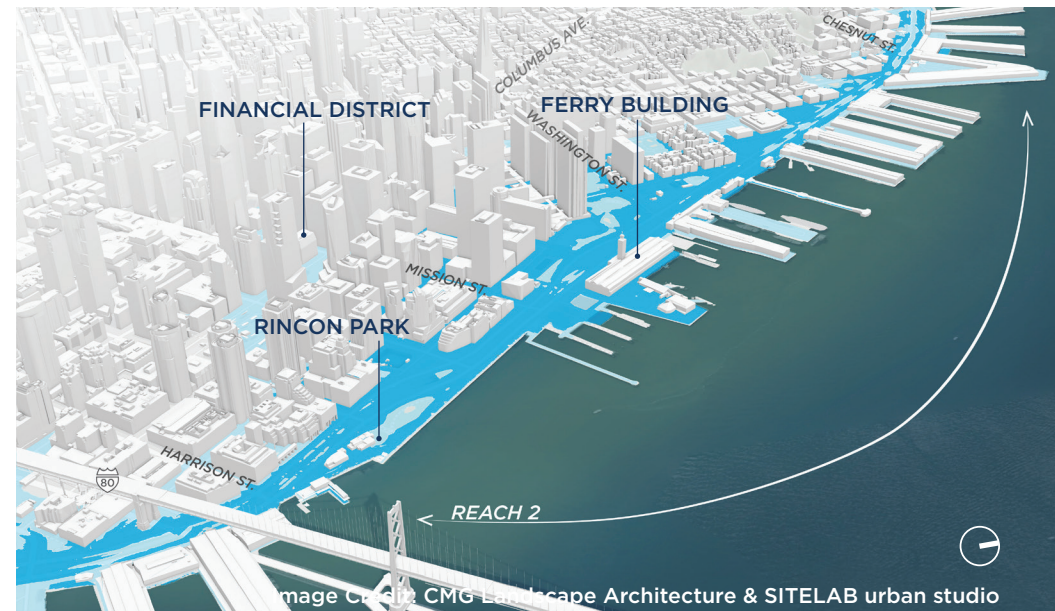


Figure 3.7: Embarcadero's potential sea level rise by 2100

- 1.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE
- 3.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE

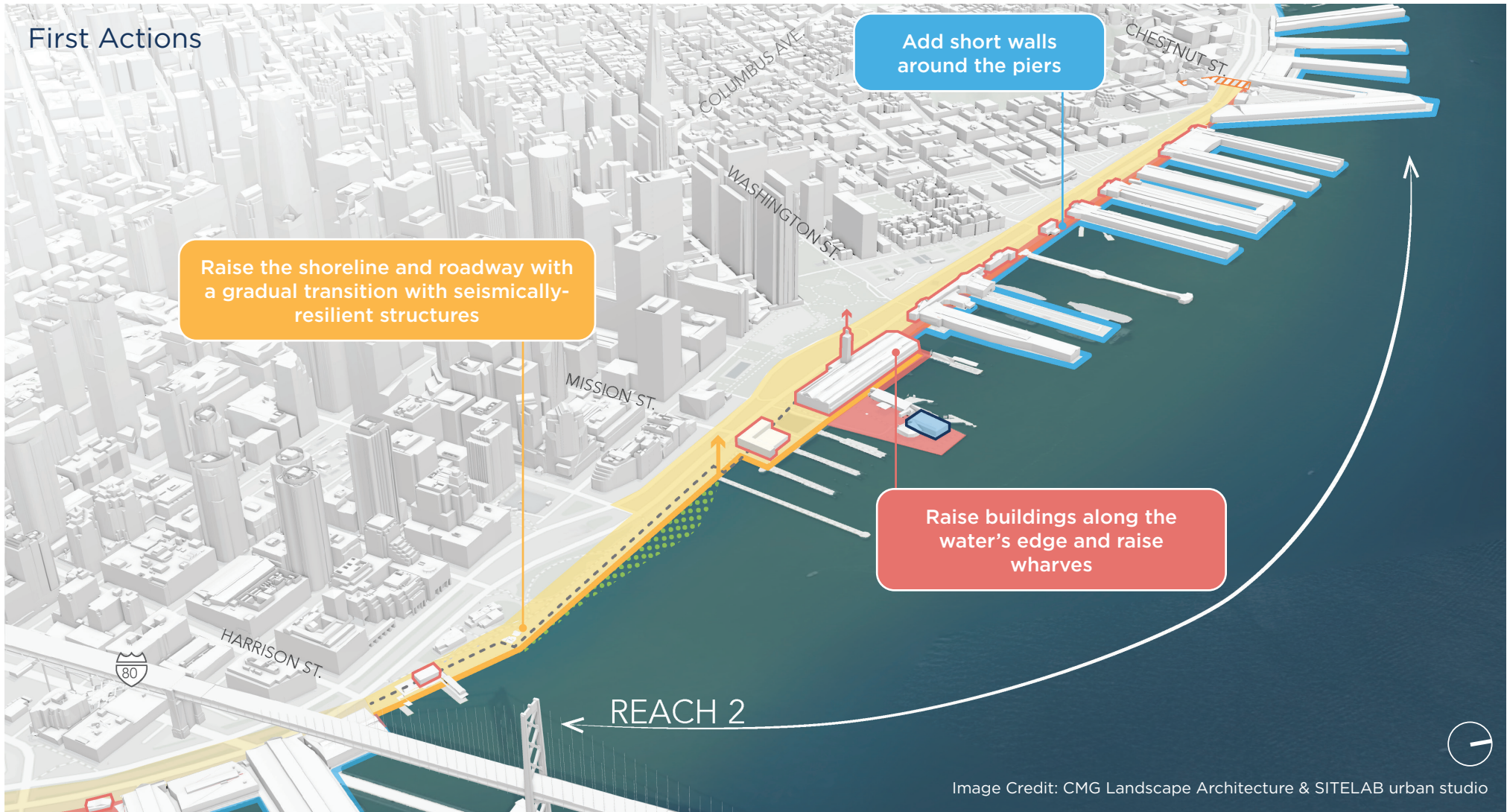


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 3.8: Embarcadero Recommended Plan

Raise Shoreline

This action will elevate the shoreline at the roadway edge and gradually slope back to existing city elevation. The action includes seismic improvements under the roadway to reduce seismic damages to flood defenses.

Elevating the shoreline presents an opportunity for new waterfront public spaces. Design details will be developed at later project phases.

Elevate Buildings and Wharves

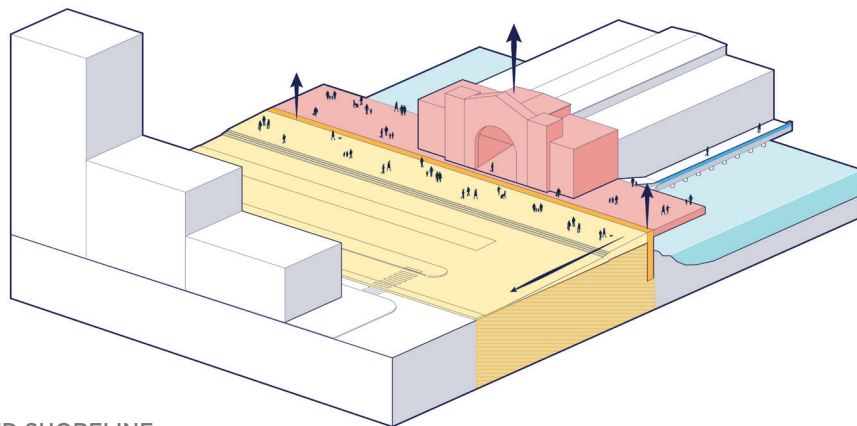
Elevate buildings and wharves along the water's edge, and rebuild with seismically-resilient structures, including the Ferry Building and historic bulkhead buildings.

Add Short Walls Around Piers

Build up to two-foot walls around piers to manage flood risks and defend against intermittent high water.

Nature-Based Features

Add living seawalls and a rocky intertidal habitat at Rincon Park.



- RAISED SHORELINE
- GROUND IMPROVEMENTS
- ELEVATED BUILDING + WHARF
- FLOODWALL

Figure 3.9: Embarcadero action explanation

1ST ACTIONS

Sea Level Rise Protection



Elevated shoreline to withstand **3.5'** of Sea Level Rise

Seismic Improvements



Ground improvements under **roadway** and **structural improvements** on wharf and bulkhead buildings

Connection to the Waterfront



Visual and physical connections **maintained**, with 2' walls along piers

Asset and System Protection



Transit and utility networks are **defended**

Nature-Based Features



Includes **living seawalls** and **rocky intertidal habitats**

DOWNTOWN COASTAL RESILIENCE PROJECT (included in Flood Study)

Downtown Coastal Resilience Project will improve flood defenses, reconstruct the seawall, and provide habitat and public amenities in the Ferry Building area, south to the Bay Bridge, where flood risk exists today.

SUBSEQUENT ACTIONS (dependent on monitoring)

- No subsequent action currently anticipated to be needed to withstand 3.5' of sea level rise, but subject to change depending on actual rate of sea level rise.

South Beach / Mission Bay

The Recommended Plan proposes shoreline improvements in this part of the waterfront to defend against 1.5 feet of sea level rise. This area generally has sufficient space available to adapt in phases without disrupting major utility or transportation systems and includes areas of existing and planned higher ground that proposed flood infrastructure will connect to. The Recommended Plan proposes a combination of berms/levees, seawalls, nature-based features such as vegetated berms and coarse beaches, and closure structures for the bridges. In addition, the Plan proposes adding short floodwalls on piers in this area.

Seawalls at the shoreline edge, elevated wharves, and gradual transitions to existing city elevation will be built along the South Beach portion of this geography, as in other areas of the Embarcadero. Seawalls are hardened structures placed along the shoreline. Design details for how this transition would work and the design of the promenade and roadway will be developed in later project phases.

Berms/levees are areas of raised ground that can help prevent flooding while maintaining waterfront access and are proposed on both banks of Mission Creek and at Terry Francois Boulevard. Seismic ground improvements are proposed for both banks of Mission Creek and along the Bay shoreline where berms/levees are located.

The closure structures at each end of the bridges would defend the surrounding neighborhoods from flooding entering across the bridges. These closures would be highly infrequent and only used in anticipation of an extreme storm or tidal event.

This approach is recommended because it:

- Prioritizes life safety and emergency response by defending the Embarcadero roadway, a key thoroughfare for delivering emergency supplies, staff, and services
- Defends and preserves historic and maritime resources
- Ensures public access to the waterfront and historic places and an inviting waterfront for all
- Safeguards public transit to keep connections throughout the city
- Includes nature-based infrastructure that enhances habitat



Image Credit: Port of San Francisco



Image Credit: Port of San Francisco

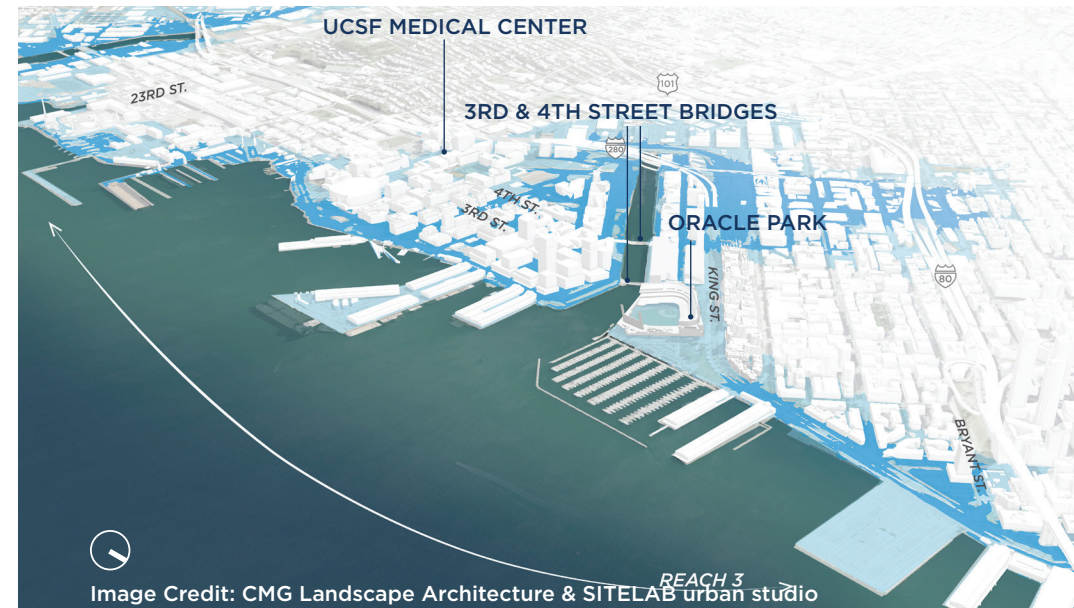


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 3.10: South Beach / Mission Bay potential sea level rise by 2100

- 1.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE
- 3.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE

First Actions

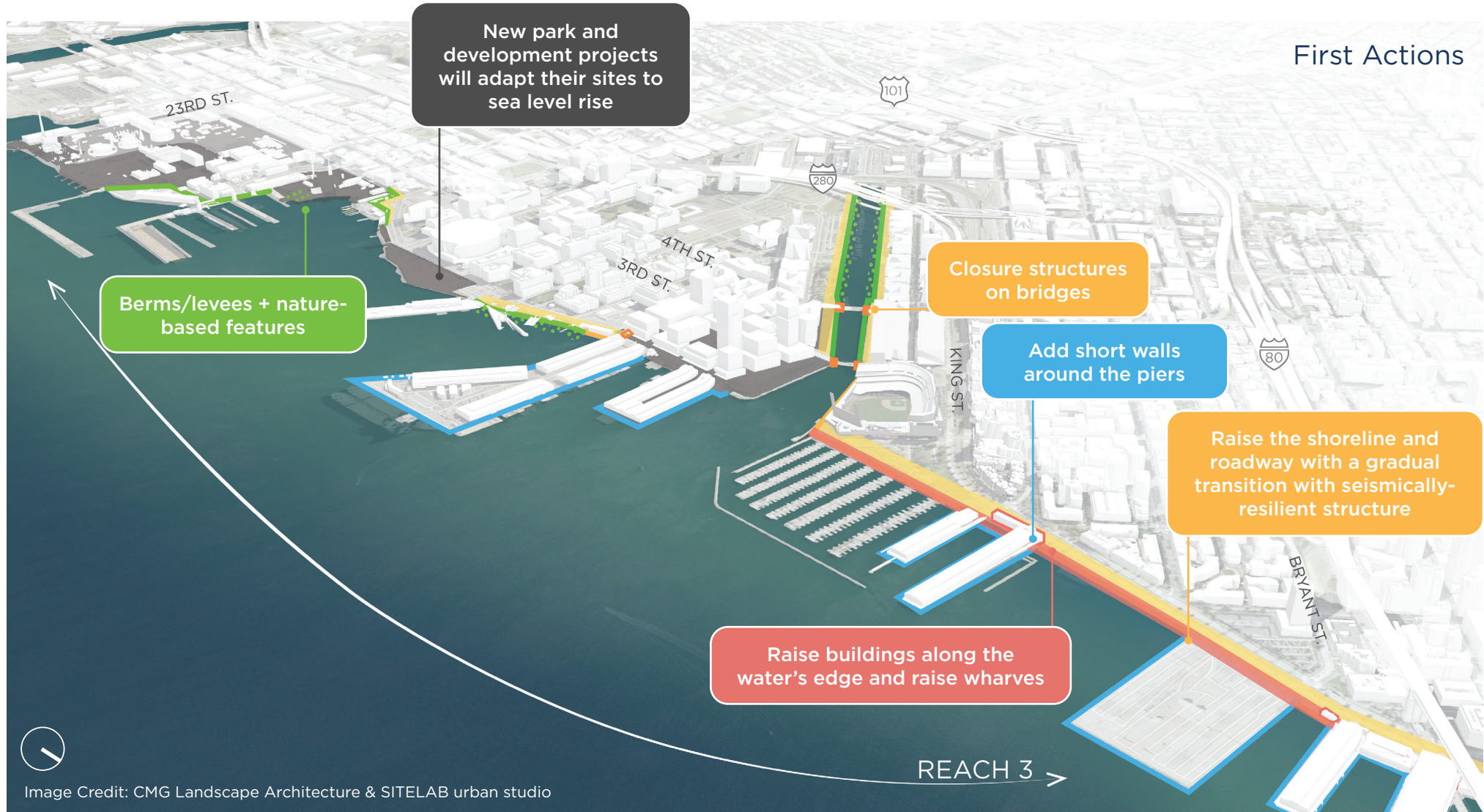


Figure 3.11: South Beach / Mission Bay Recommended Plan



Elevate Buildings and Wharves

Elevate seawall and wharves along the water’s edge with seismically-resilient structures.



Closure Structure on Bridges

Closure structures on Third and Fourth Street Bridges close gaps in the elevated shoreline to prevent flooding. It is anticipated that these closures would be infrequent (less than once a year) and used in anticipation of a large storm or tide event.



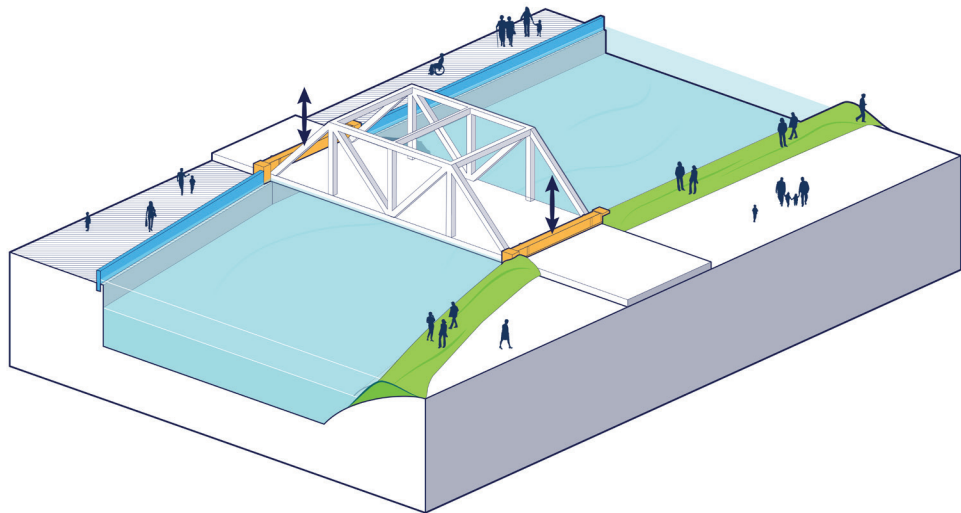
Berms/Levees + Nature-Based Features

Berms/levees are areas of raised ground that can help prevent flooding while maintaining waterfront access. They can include public space, such as walking or biking paths, and incorporate vegetation that support habitats.



Add Short Walls Around Piers

Build up to two-foot walls around piers to manage flood risks and defend against intermittent high water.



- CLOSURE STRUCTURE
- BERM/LEVEE
- FLOODWALL

Figure 3.12: South Beach / Mission Bay action explanation

1ST ACTIONS

Sea Level Rise Protection	✓	Elevated shoreline to withstand 1.5’ of Sea Level Rise
Seismic Improvements	✓	Ground improvements under roadways, shoreline promenades, and open space
Connection to the Waterfront	✓	Visual and physical connections maintained , opportunities to access water on berms/levees
Asset and System Protection	✓	Transit and utility networks are defended , bridges remain in place
Nature-Based Features	✓	Vegetated berms/levees along Mission Creek and Mission Bay, and nature-based features at Crane Cove Park

EARLY PROJECT (included in Flood Study)

The South Beach Coastal Resilience Project will replace the seawall and wharves along a half-mile stretch of The Embarcadero between Harrison and Townsend Streets. The new structures will be earthquake-stable, raised to protect the waterfront from sea level rise, and adaptable to even more sea level rise in the future.

SUBSEQUENT ACTIONS (dependent on monitoring)

- Elevate shoreline to withstand **3.5’ of Sea Level Rise**
- Incorporate additional nature-based features along the creek and Bay shoreline

Islais Creek / Bayview

The Recommended Plan proposes shoreline improvements in this part of the waterfront to defend against 1.5 feet of sea level rise. This area has sufficient space available to adapt in phases without disrupting major utility or transportation systems. The Recommended Plan proposes a combination of seawalls, berms/levees, nature-based features such as vegetated berms, coarse beaches, and wetland preservation, and closure structures for the bridges.

The closure structures at each end of the Illinois Street Bridge would defend the surrounding neighborhoods from flooding entering across the bridge. It is anticipated that these closures would be infrequent (less than once a year) and used only in anticipation of a large storm or tide event.

Citywide Muni facilities would be defended by a berm/levee connected to a floodwall along the north side of Islais Creek. A berm/levee would be placed on the south side of the creek, raising the shoreline while maintaining waterfront access. Port cargo facilities would be adapted with seawalls and seismic ground improvements.

This approach is recommended because it:

- ▮ Prioritizes life safety and emergency response by defending key staging sites
- ▮ Defends and preserves jobs and maritime resources
- ▮ Safeguards public transit to keep connections from Bayview to the rest of the city
- ▮ Ensures public access to the waterfront and important historic and cultural places and an inviting waterfront for all
- ▮ Includes nature-based infrastructure that enhances habitat



Image Credit: Port of San Francisco

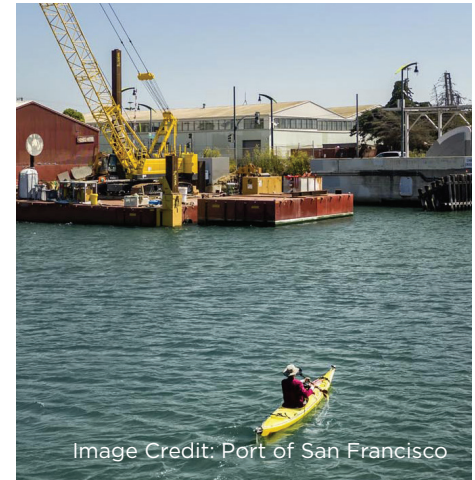


Image Credit: Port of San Francisco

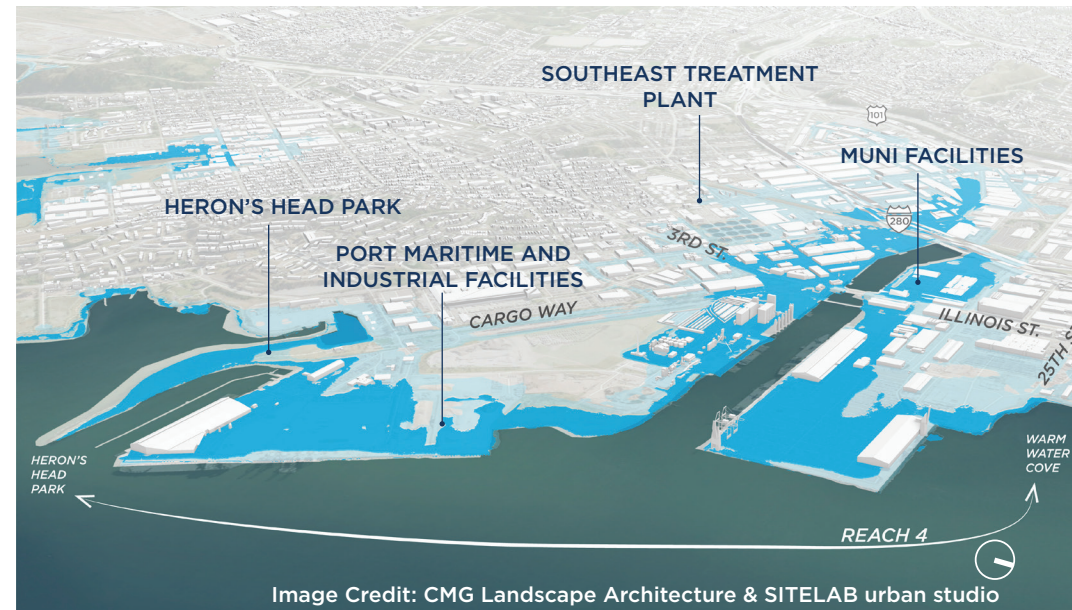


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 3.13: Islais Creek / Bayview potential sea level rise by 2100

- 1.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE
- 3.5 FEET SEA LEVEL RISE + EXTREME HIGH TIDE

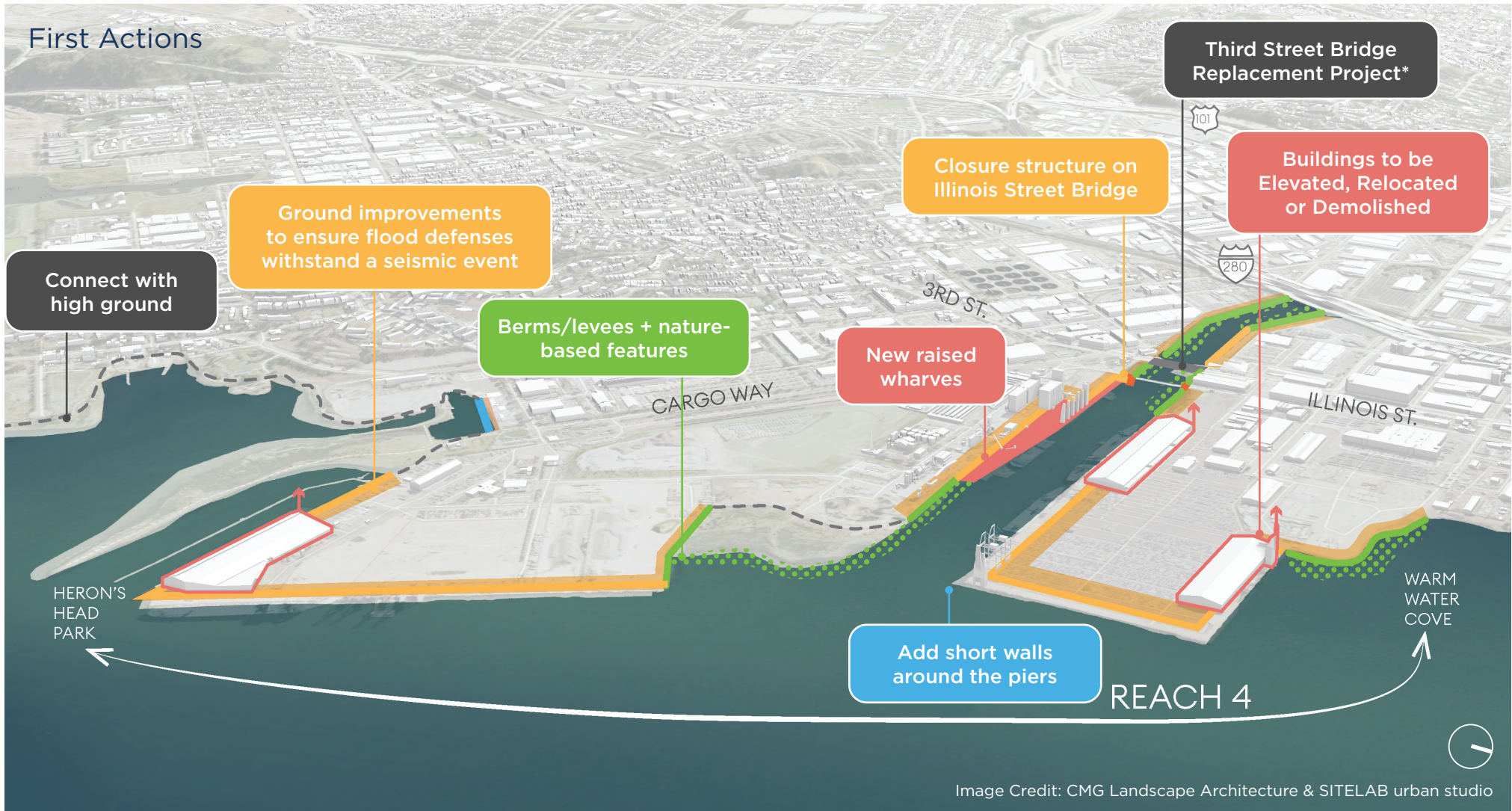


Figure 3.14: Islais Creek / Bayview Recommended Plan

*non- Federal action

Closure Structure on Bridges

Closure structures on Illinois Street Bridges close gaps in the elevated shoreline to prevent flooding.

It is anticipated that these closures would be infrequent (less than once a year) and used in anticipation of a large storm or tide event.

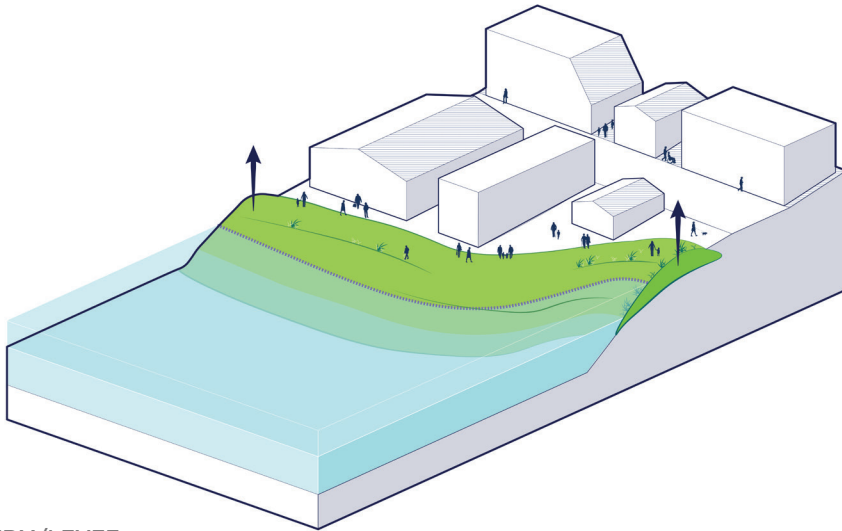
Add Short Walls Around Piers

Build up to two-foot walls around piers to manage flood risks and defend against intermittent high water.

Berms/Levees + Nature-Based Features

Berms/levees are areas of raised ground that can help prevent flooding while maintaining waterfront access.

They can include public space, such as walking or biking paths, and incorporate vegetation that support habitats.



● BERM/LEVEE

Figure 3.15: Islais Creek / Bayview action explanation

1ST ACTIONS

Sea Level Rise Protection



Elevated shoreline to withstand **1.5'** of Sea Level Rise

Seismic Improvements



Ground improvements under roadways and shoreline promenades/open space

Connection to the Waterfront



Visual and physical connections **maintained**, opportunities to access water on berms/levees

Asset and System Protection



Transit and utility networks are **defended**, bridges remain in place

Nature-Based Features



Habitat enhancements along Islais Creek, Pier 94 wetlands, and Warm Water Cove

EARLY PROJECT (not included in Flood Study)

SF Public Works Third Street Bridge elevation.

The Regionally Advancing Living Shorelines project will develop living shorelines approaches at Pier 94 to protect and enhance existing wetlands.

SUBSEQUENT ACTIONS (dependent on monitoring)

- Elevate shoreline to withstand **3.5'** of Sea Level Rise
- Incorporate additional nature-based features along the creek and Bay shoreline



4 Notice of Public Availability

Image Credit: Port of San Francisco

The Recommended Plan is available on the USACE website at:

<https://www.swt.usace.army.mil/Library/Docs-and-Comms/>

Find “San Francisco Waterfront Coastal Flood Study” under “Final Reports”, click on “+” sign to access links to documents.



District Commander Findings

“ I find that the San Francisco waterfront is at risk of flooding during coastal storms, extreme tides, and due to future relative sea level change. Flooding along the waterfront would cause extensive damage to public infrastructure and private property, potential loss of life, deterioration of public health and safety, degradation of the natural environment, and adverse changes to the social and economic character of the waterfront communities. These risks and their consequences are expected to increase over time as water levels rise in the bay. Additionally, the study area is in a high seismic hazard region and flood risk measures should be designed in accordance with USACE seismic criteria.

In accordance with the NEPA, a diligent effort was made to coordinate and collaborate with resource agencies, local industry, and community and environmental interests in formulating alternatives and developing the Recommended Plan. Environmental resources concerns were addressed through the study process to ensure that adverse impacts were avoided to the maximum extent practicable. To ensure the Recommended Plan complies with all applicable laws and policies and is acceptable to the public, the draft IFR-EIS had undergone public, policy, and technical review. The study team has addressed any outstanding issues raised during the review and confirmed the analysis in this final IFR-EIS.

USACE policy precludes advancing the Recommended Plan for Congressional authorization until it or separable elements of the plan achieve 35% design maturity and the cost estimate is validated. Moving forward, the NFS may undertake additional design, updated cost estimates, and other implementation actions for elements of the Recommended Plan with oversight from USACE where possible and advance those for consideration by the Chief of Engineers to support a future recommendation for Congressional authorization.



4.1 WHERE TO FIND MORE AND THE LATEST INFORMATION?

Visit the following Waterfront Resilience Program website: sfport.com/wrp

To stay in touch, please sign up for the WRP’s eNewsletter and mailing list by visiting www.SFport.com/signup and selecting Waterfront Resilience Program from the list in the form provided.

