



DRAFT PLAN HIGHLIGHTS



SAN FRANCISCO WATERFRONT FLOOD STUDY
JANUARY 2024



U.S. Army Corps
of Engineers



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

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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

Shortened Term

U.S. Army Corps of Engineers or USACE	USACE
San Francisco Waterfront Coastal Flood Study, CA	San Francisco Waterfront Flood Study (The Flood Study)
Draft Integrated Feasibility Report and Environmental Impact Statement	Draft Report
Tentatively Selected Plan	Draft Plan
Plan Formulation	Adaptation Strategies
Final Integrated Feasibility Study and Environmental Impact Statement	Final Report



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 **Draft Plan**, which proposes approximately where to build coastal flood defenses and how much sea level rise the future coastal flood defenses will manage for the next century.

Image Credit: Port of San Francisco

What is the Draft Plan?

The Draft 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 also identifies their proposed locations. The Draft Plan evolved from the best ideas and approaches from the Draft Waterfront Adaptation Strategies released for public review in 2022. The proposed solutions are estimated to cost \$13 billion, and, if approved by Congress, the Federal government may pay up to 65% of the construction cost. Cost estimates are preliminary, high-level, and subject to change. The Draft Plan includes a Monitoring and Adaptation Plan to track evidence of sea level rise and global climate change to understand when future adaptation to plan actions will be required. The Draft Plan will inform subsequent stages of funding and design in order 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 six years of community engagement and public input, the Draft Plan is a critical milestone in San Francisco’s continued, long-term efforts to defend our waterfront against flood risk and sea level rise, while also enhancing the seismic stability of our waterfront’s flood management structures and complementing waterfront improvements.



Image Credit (for all): Port of San Francisco

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**

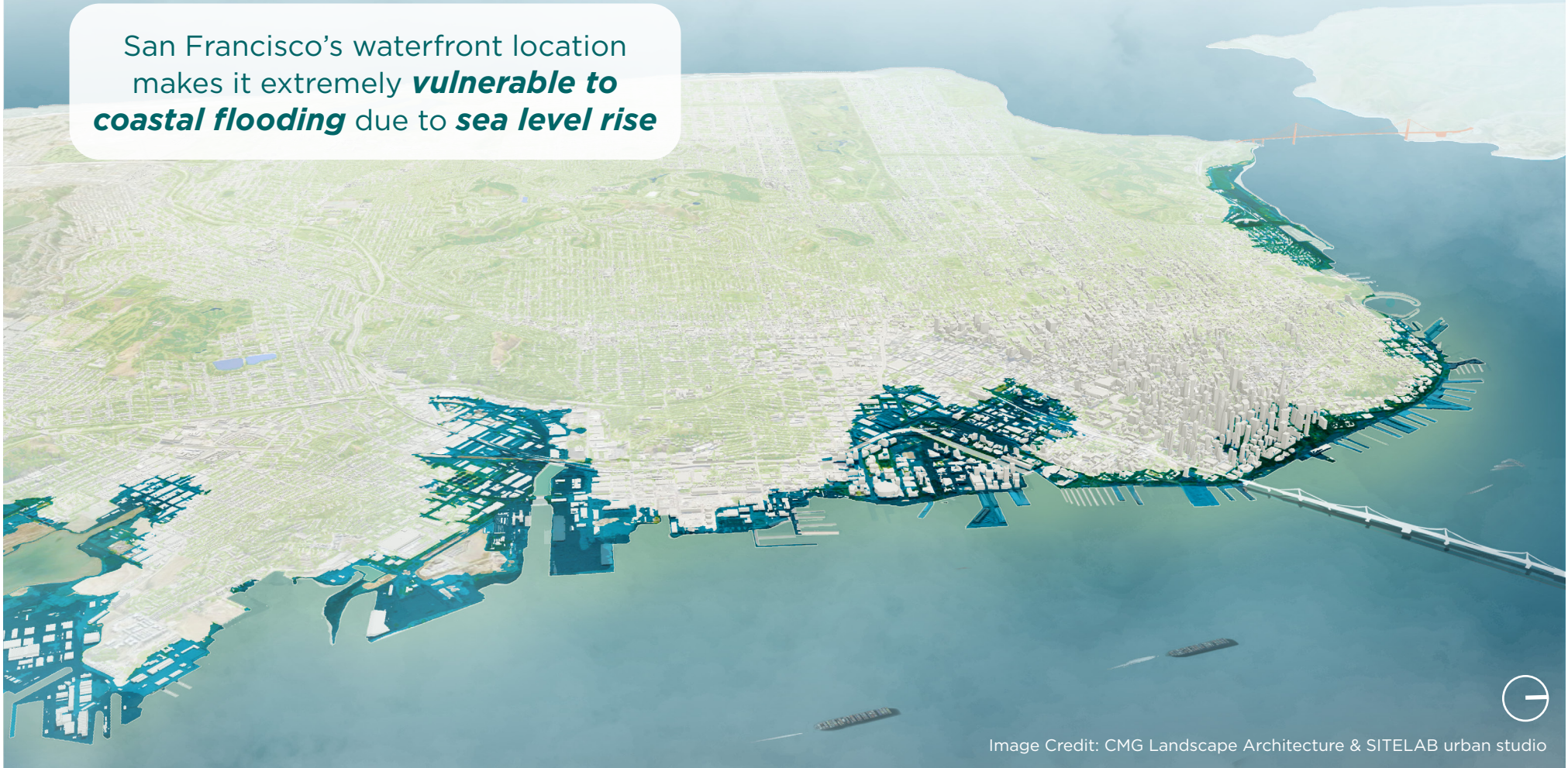


Image Credit: CMG Landscape Architecture & SITELAB urban studio

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 and earthquake risks today. To defend San Francisco from current and future flood risk shown in Figure 1.3, there is a need to strengthen the waterfront against urgent earthquake risks and adapt shoreline elevations to defend against 1.5 to 3.5 feet of 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 today during extreme storms.

Model simulations suggest that, without Federal action, 100 to 500 structures and assets will be vulnerable to flooding by 2050. By 2140, damages could be valued up to \$23 billion.

Up to **40,000 people** could be at risk on Port property if an earthquake occurs during the day



Image Credit: American Stock/
Getty Images

Figure 1.4: Earthquake damage from the San Francisco Earthquake of 1906

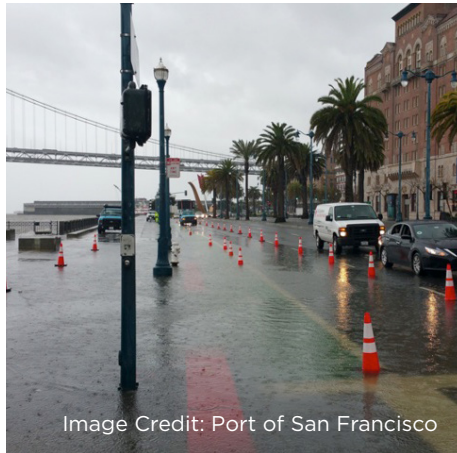


Image Credit: Port of San Francisco

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 activities 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 Port assets. On-going Port efforts include Early Projects (near-term actions, focused on improving life safety and citywide disaster response capabilities) 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 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

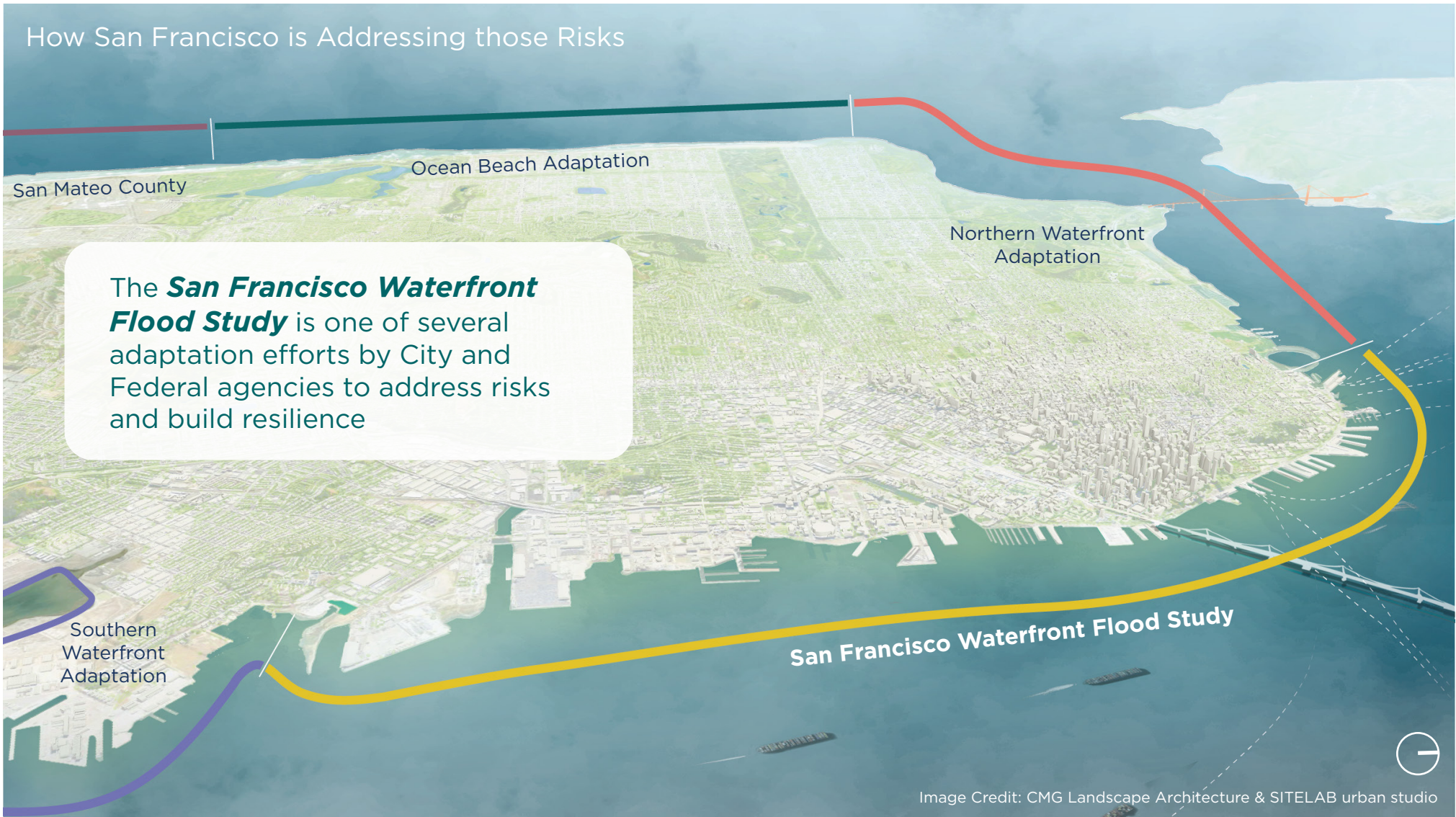


Figure 1.6: San Francisco adaptation efforts



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?

On January 26, 2024, USACE and the City published the Draft Plan. The Draft Plan is part of the Flood Study, which 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. The Flood Study team will continue to refine the Draft Plan and Environmental Review to incorporate comments. The Flood Study team will develop a

Recommended Plan, to be approved/endorsed by USACE leadership and then recommended for congressional authorization in 2026. Congress must authorize the final Recommended Plan for the plan to move forward.

We Are Here
Release of Draft Plan

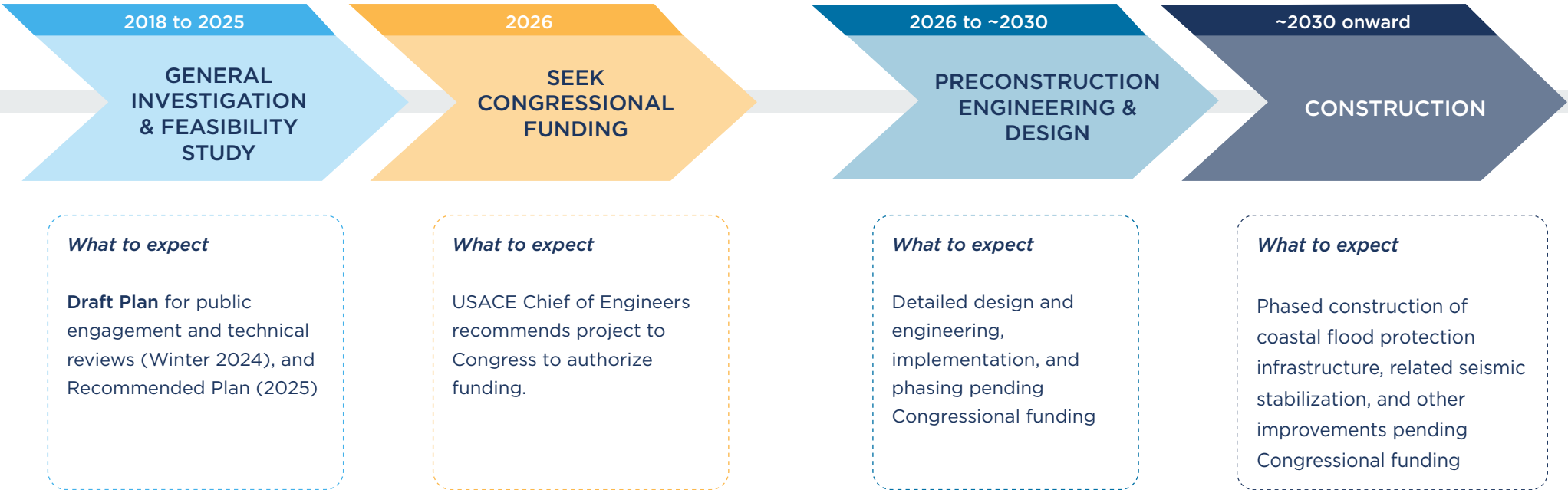


Figure 2.1: Flood study process

Note: Dates are approximate and subject to change. Projects will occur in phases. Many first actions will not be ready for implementation or construction in 2030 or 2050 respectively.

2.3 WHAT'S INCLUDED IN THE DRAFT 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.

The Draft Plan is one component of the Flood Study and indicates approximately where to build flood defenses, how high to build flood defenses, and how much space to use.

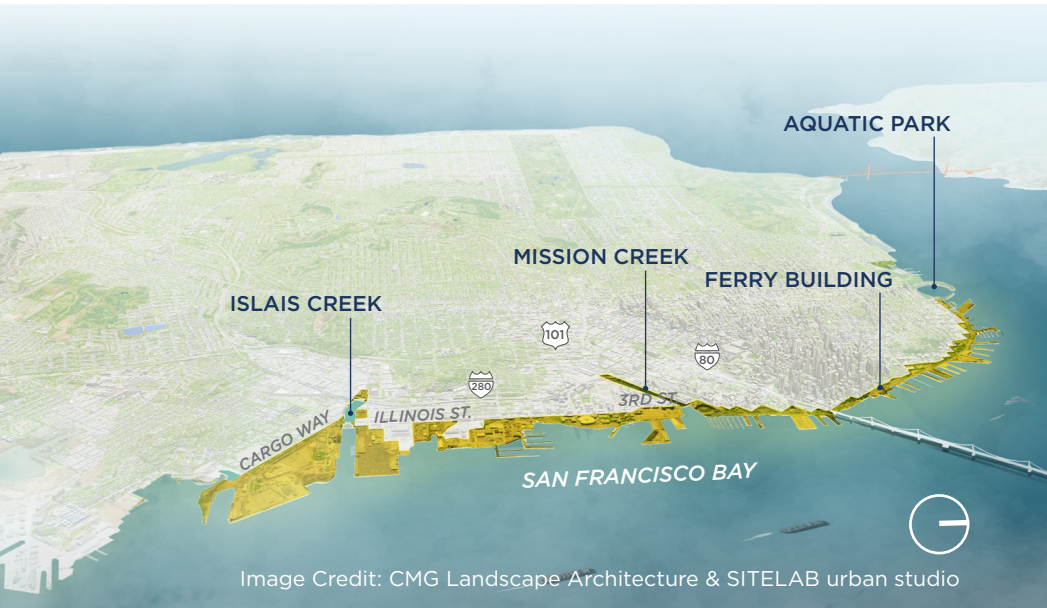
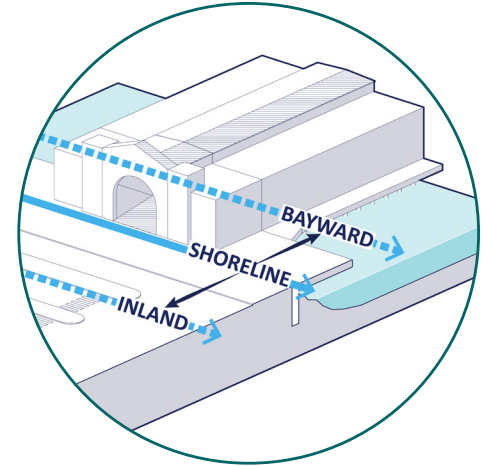


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 2.2: Port of San Francisco jurisdiction

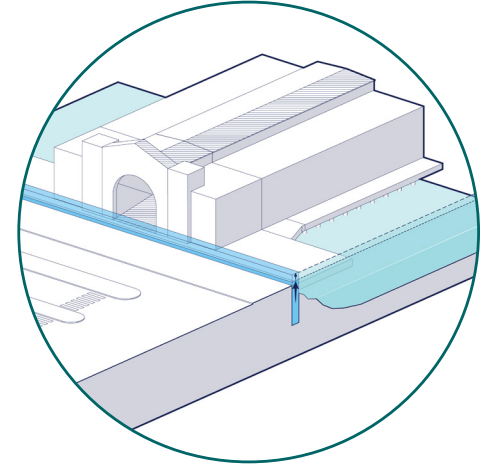
Where to build flood defenses?

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.

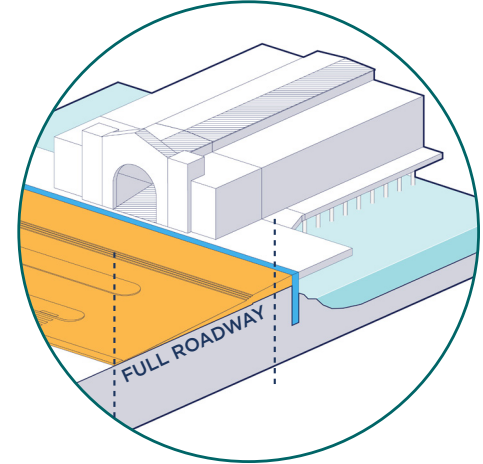


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 2.3: What is in the Draft Plan

2.4 HOW DID WE DEVELOP THE DRAFT PLAN?

The Draft Plan is informed by understanding risks, opportunities and constraints, and community engagement. This led to the seven Draft Waterfront Adaptation Strategies, which were released for public review in 2022 and represent different ways for the City to build resilience for the next 100 years. Public feedback and cost-benefit tradeoffs influenced the development of the Draft Plan that will address flood risk with uncertain timing.

Environmental consequences of the Draft Plan and a high-level comparison of the environmental consequences for each of the Draft Strategies have been assessed as described in the National Environmental Protection Act Environmental Impact Statement.

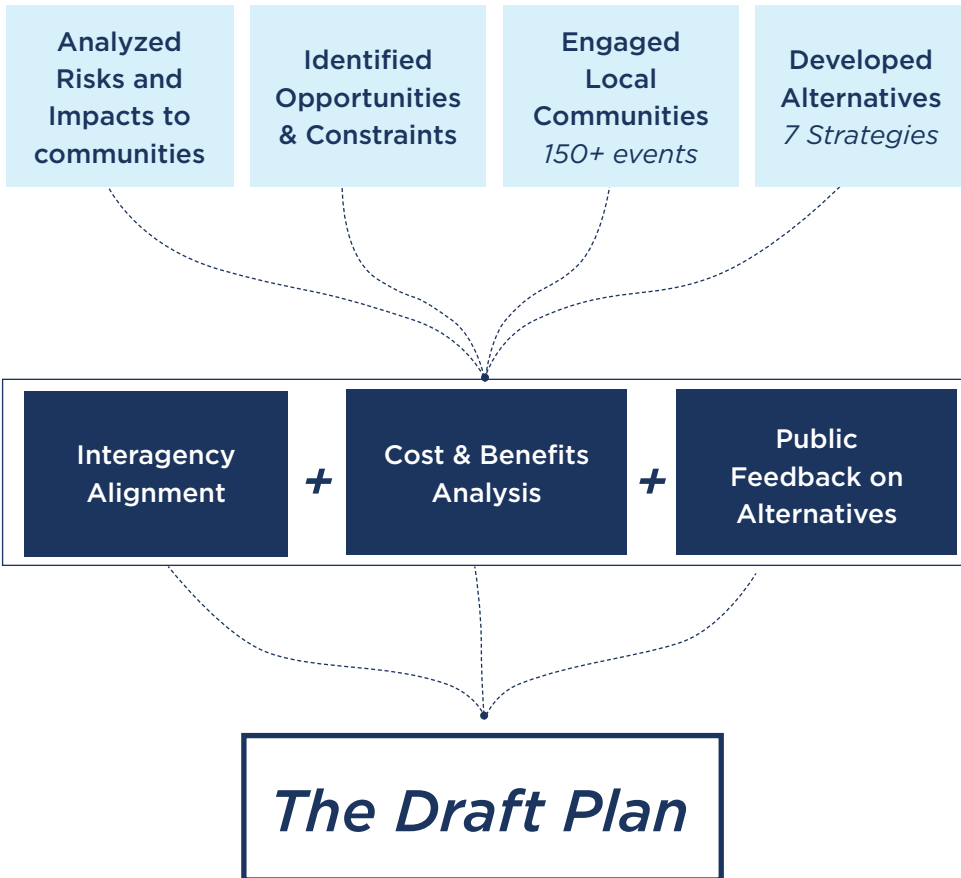


Figure 2.4: Draft Plan development process

A Comprehensive Cost Benefit Analysis That Elevates Equity

The Flood Study is the first USACE mega-study on the West Coast, making the Draft 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 Draft Plan accounts for social and environmental benefits and impacts in addition to more traditional economic analysis, pioneering a new approach for how USACE evaluates and selects plans like these. This means environmental justice, social and economic equity, and environmental benefits are factored into 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 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. The earliest actions (or “first actions”) of the final Recommended Plan will focus on addressing the areas of greatest flood risk. Later actions are outlined to address future sea level rise and increased flood risk.

USACE and the City will develop an implementation and phasing plan, which will deliver projects as efficiently as possible, aiming to minimize disruption and maintain waterfront access. In developing the plan, factors such as flood and earthquake risk, other construction in a given area, age and condition of City assets, and availability of federal, state and local funding will be considered.

2.6 WHAT IS NOT IN THE DRAFT PLAN?

What’s not being decided at this stage?

The Draft Plan does not include the following:

- ▶ Detailed designs for flood defenses
- ▶ Designs for waterfront streets, open spaces, and infrastructure (including pumping stations)
- ▶ Timing and sequencing of construction
- ▶ Funding plan

These elements will be refined following public engagement and technical analysis.

The Draft Plan is not:

- ▶ A design for the future waterfront
- ▶ A plan for the Embarcadero Historic District, the Ferry Building and public plazas and roadway, and creek and shoreline amenities
- ▶ Project plans and implementation strategies will leverage other opportunities, align with other public and private projects, and reflect what the City can afford given other capital obligations

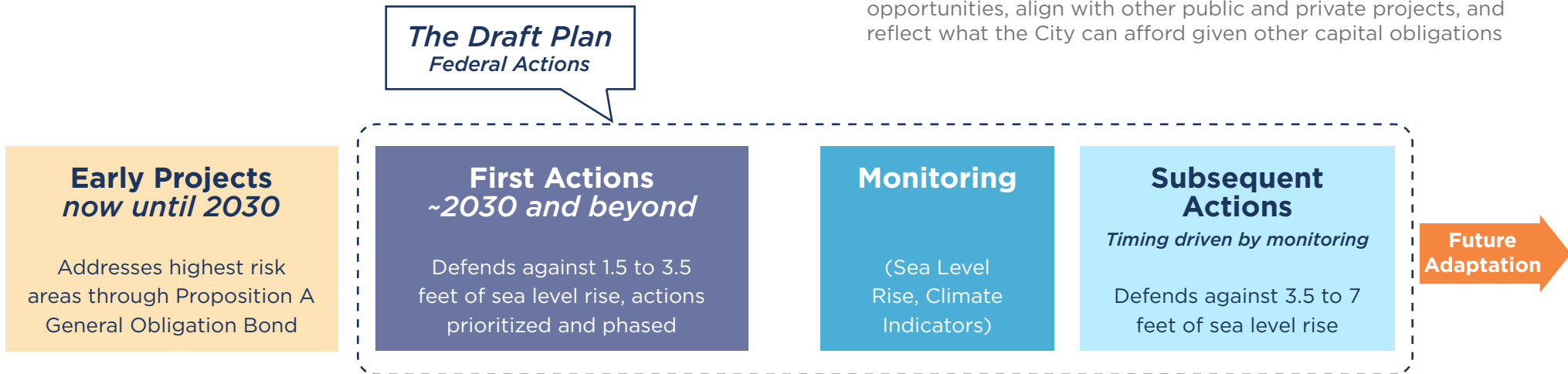


Figure 2.6: Adaptation phasing



3 *The Draft Plan*

Image Credit: Port of San Francisco

A CATALYST FOR A MORE RESILIENT SAN FRANCISCO

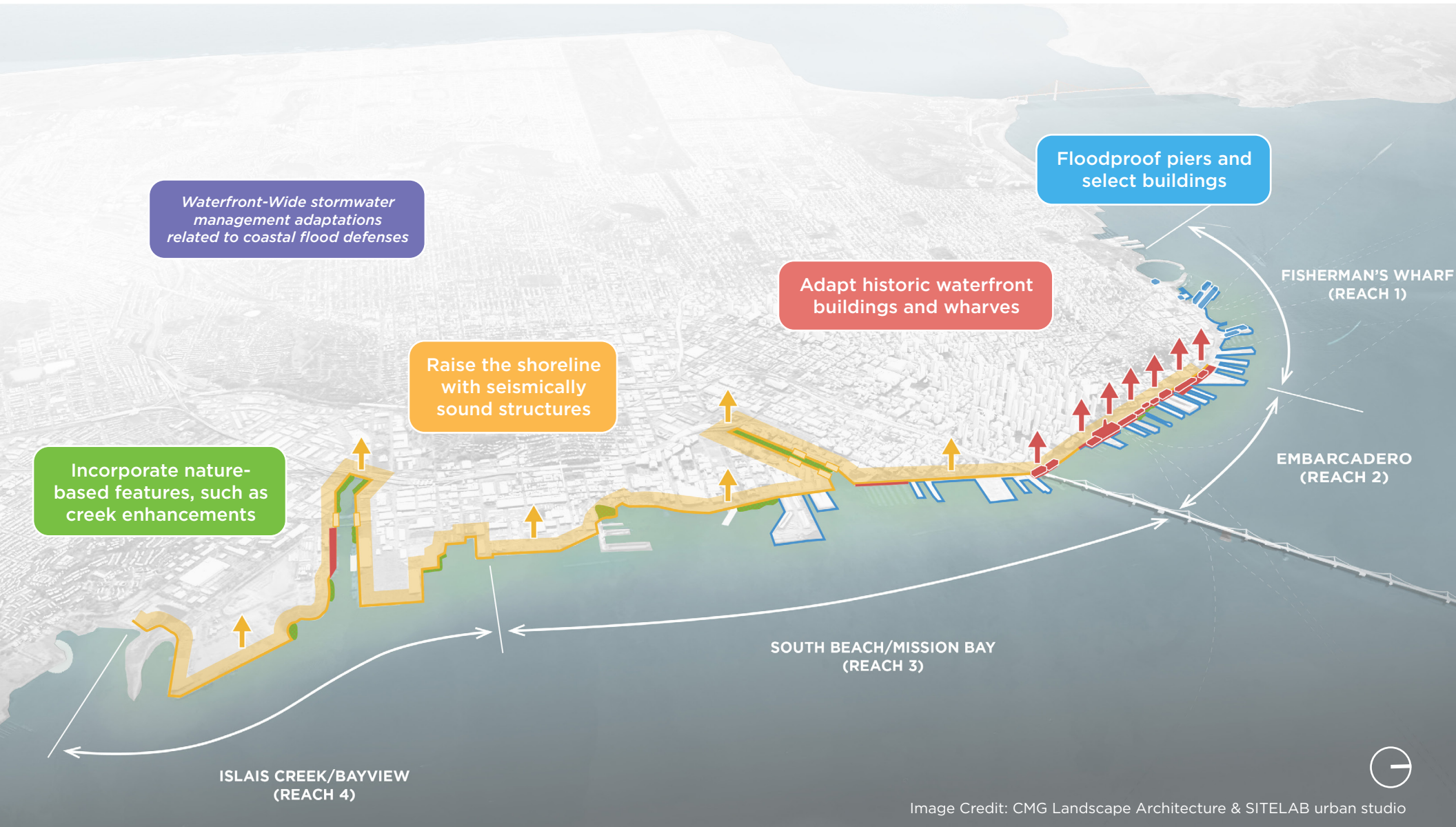


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 3.1: The Draft Plan

3.1 A CATALYST FOR A MORE RESILIENT SAN FRANCISCO

If the project moves forward with funding, this is a once-in-a-century opportunity to:

- ▶ Defend communities, assets, and infrastructure against coastal flooding
- ▶ Improve earthquake safety related to flood defense projects
- ▶ 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 DRAFT PLAN

The Draft Plan consists of **five broad categories of actions**, totaling **12 actions**, applied across the waterfront.

12 Draft 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. Undertake seismic ground improvements to flood defenses
3. Construct closure structures on the bridges/tie into 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-sound, elevated wharves

Floodproof piers and select buildings

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

Incorporate nature-based features

8. Construct living seawalls (optional)
9. Build vegetated berms/levees
10. Preserve wetlands

Stormwater management adaptation related to coastal flood defenses

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

Figure 3.2:12 Draft Plan actions

3.3 PUBLIC FEEDBACK

The development of the Draft Plan incorporated over six years of public input and rigorous technical analysis. The Port has connected with tens of thousands of community members through over 150+ events to understand community priorities and concerns. The release of the Draft Plan presents another opportunity to directly shape the eventual Recommended Plan.

Focus on life safety and emergency response



Proposes 7.5 miles of new flood defenses to protect the City



Reduces damages to disaster recovery facilities



Flood defenses will be able to withstand a major earthquake

Image Credit (for all): Port of San Francisco

Consider Equity and Environmental Justice

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

Put people first, prioritizes assets and services



Defends all housing - 13,500 residents



Defends services people depend on, such as utilities and transportation



Preserves nearly 80 cultural and community assets

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

Enables future opportunities to improve the public realm



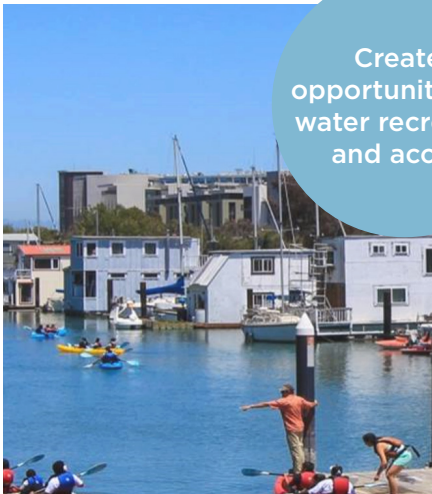
Prioritize nature and healing the Bay



Includes options for nature-based features like living seawalls



Preserves existing wetlands



Creates opportunities for water recreation and access

Creates opportunities to expand habitat in future iterations of the plan



Image Credit (for all): Port of San Francisco

Image Credit (for all): Port of San Francisco

3.4 ACTIONS BY NEIGHBORHOOD

The flood defenses outlined in the Draft 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. It also facilitates modeling and evaluation of alternatives.

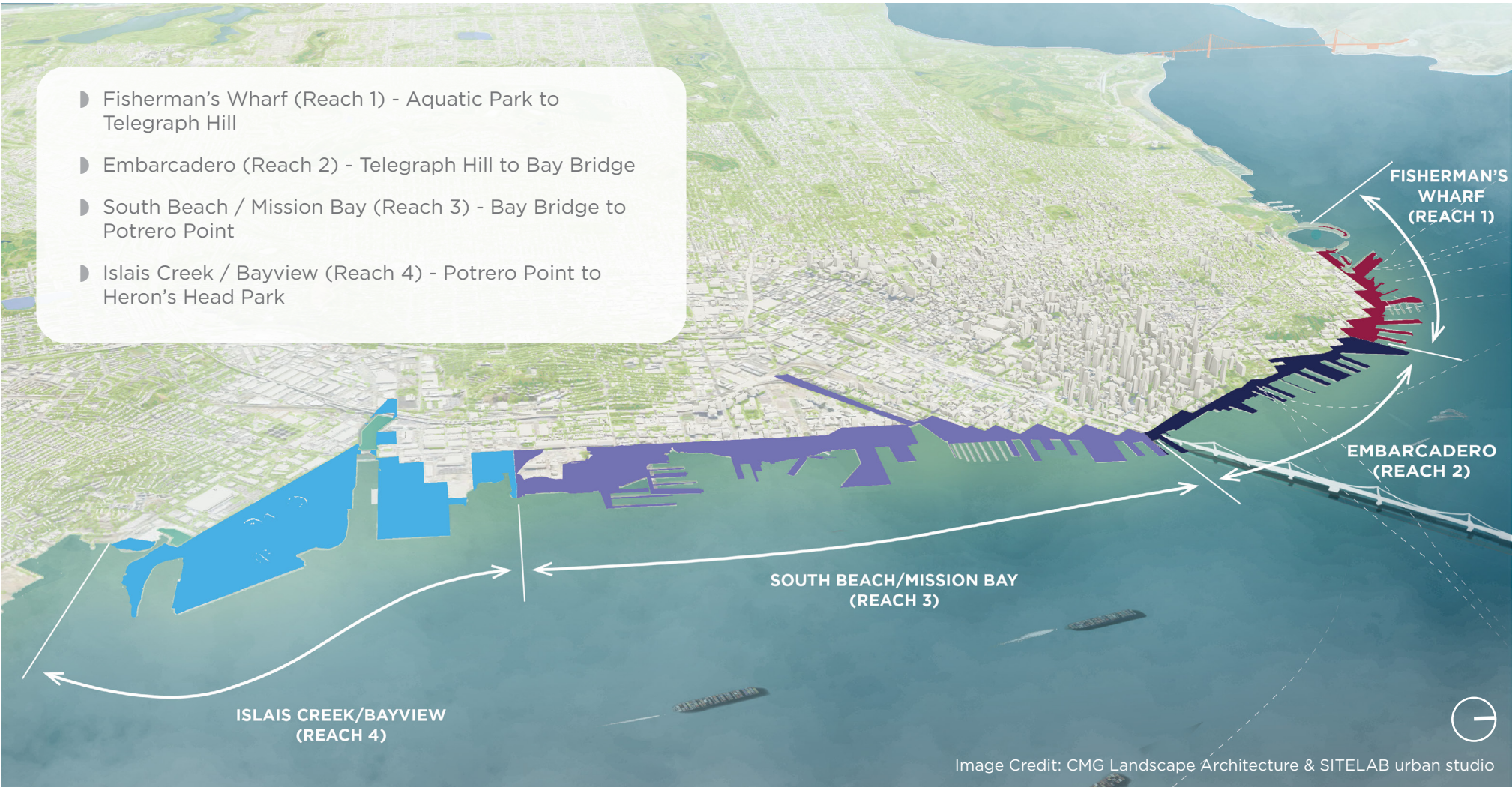


Figure 3.3: Waterfront wide reach boundaries

Fisherman's Wharf

Fisherman's Wharf is located on a higher area that modeling shows will encounter lower flood damages than other areas of the waterfront. The Draft 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 2 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



Image Credit: Port of San Francisco



Image Credit: Port of San Francisco

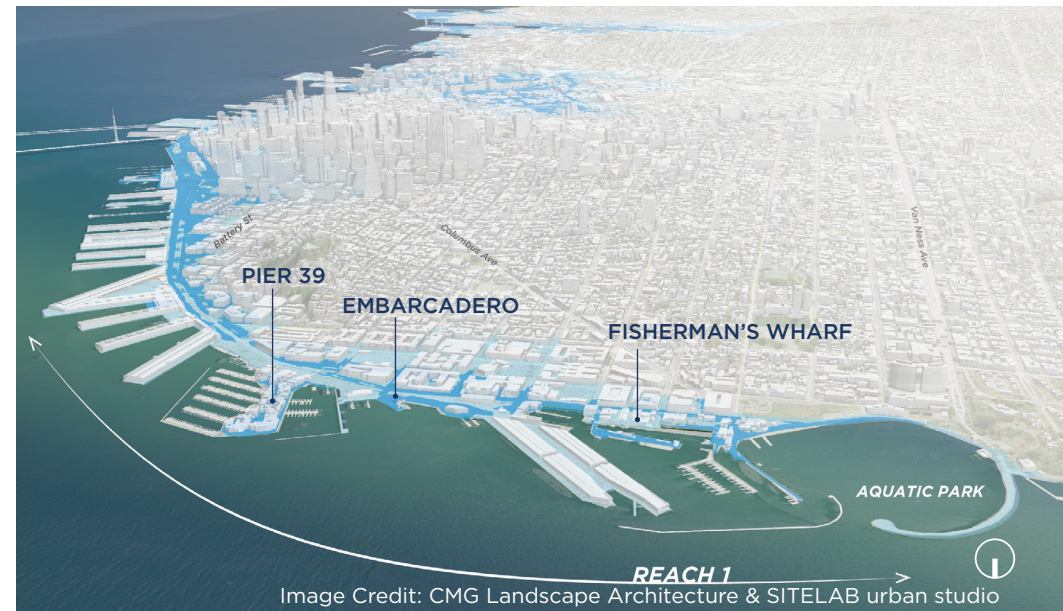


Image Credit: CMG Landscape Architecture & SITELAB urban studio

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

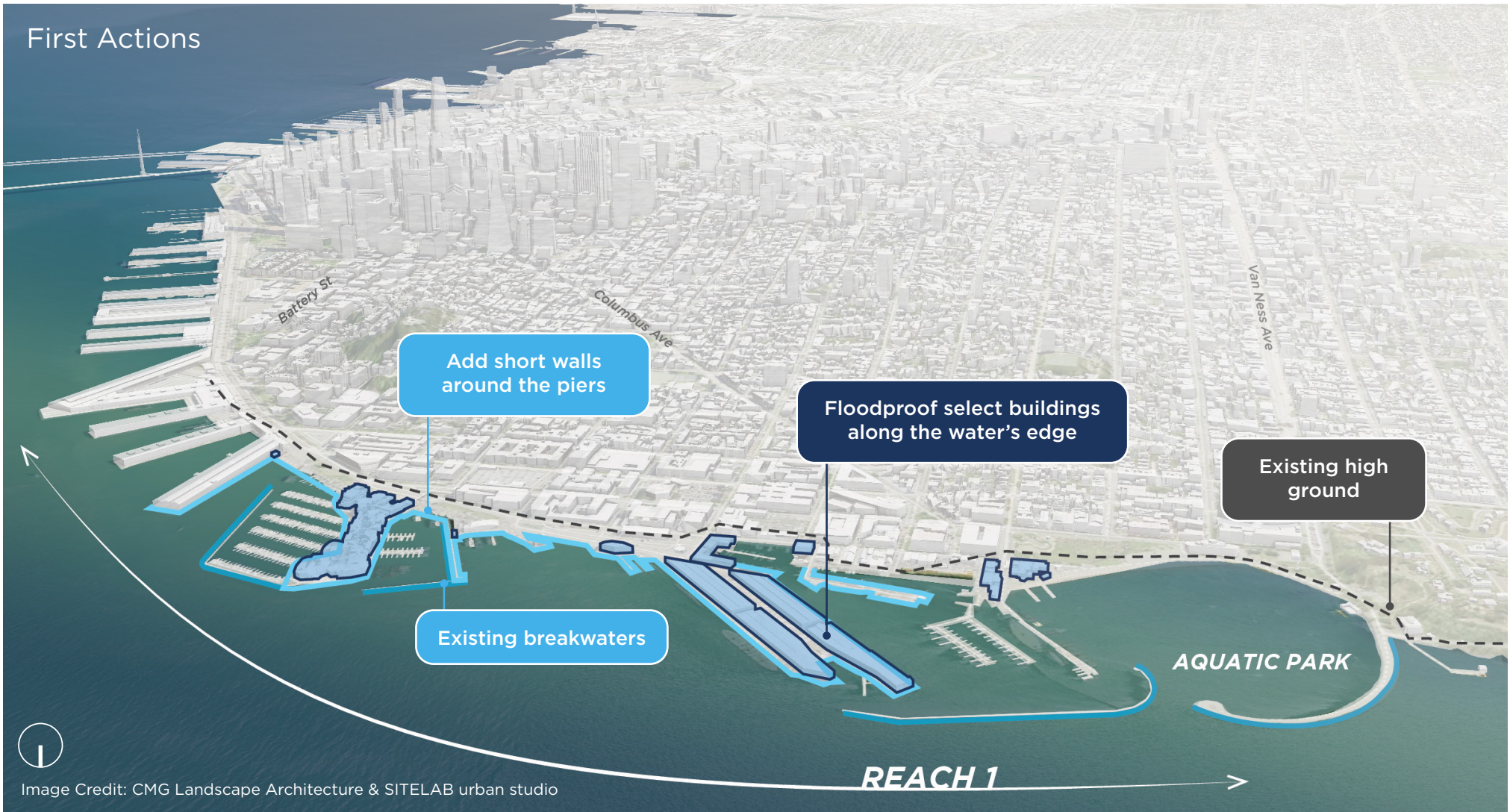


Image Credit: CMG Landscape Architecture & SITELAB urban studio

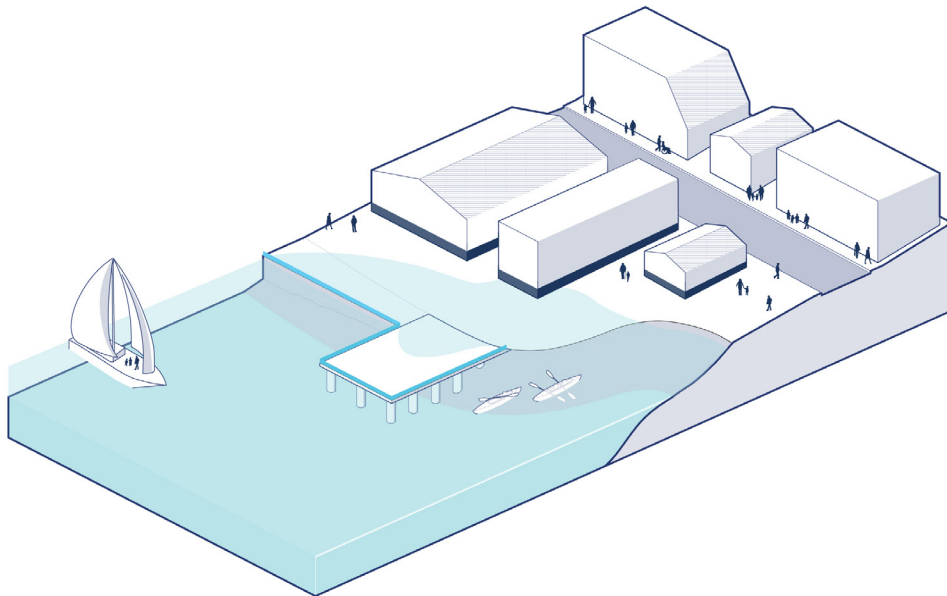
Figure 3.5: Fisherman's Wharf Draft Plan

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 Draft 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

EARLY PROJECT (not included in Flood Study)

Wharf J9, adjacent to the outer lagoon in Fisherman's Wharf, will replace the seawall and wharf and incorporate seismic retrofits in 2027.

SUBSEQUENT ACTIONS (dependent on monitoring)

- Elevate the shoreline, wharves, and historic buildings
- Seismic ground improvements.
- Protect utility/transportation networks

The Embarcadero

The Draft 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 in the first action. Seawalls are hardened structures that are placed at 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 and 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 Draft Plan proposes to raise buildings along the water’s edge, including the Ferry Building and historic bulkhead buildings, and the Embarcadero roadway. The Draft Plan does not include a tall wall that would block views along the shoreline.

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

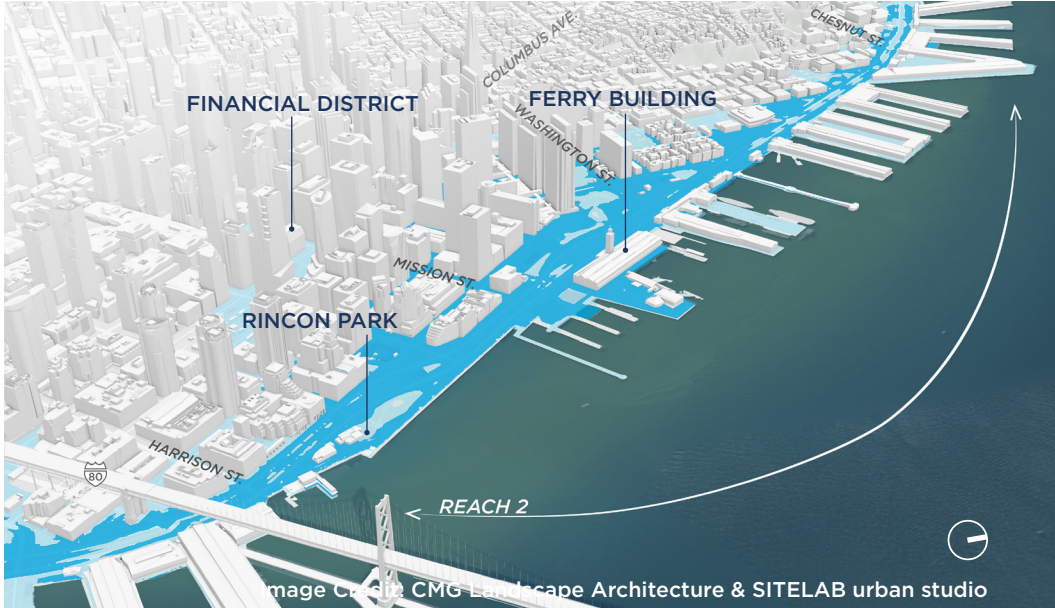
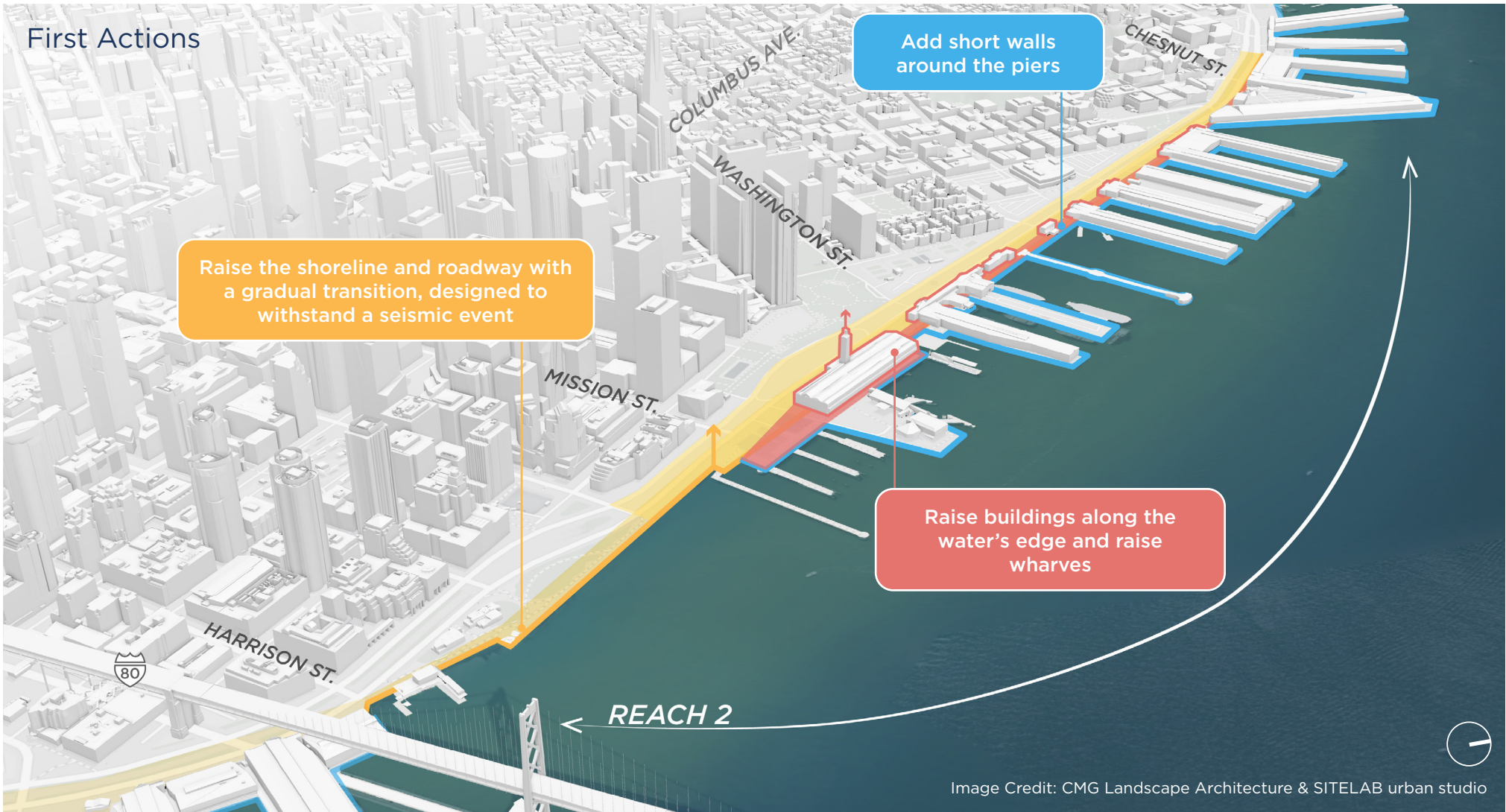


Figure 3.7: Embarcadero potential sea level rise by 2100

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



First Actions

Raise the shoreline and roadway with a gradual transition, designed to withstand a seismic event

Add short walls around the piers

Raise buildings along the water's edge and raise wharves

← REACH 2

Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 3.8: Embarcadero Draft 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.

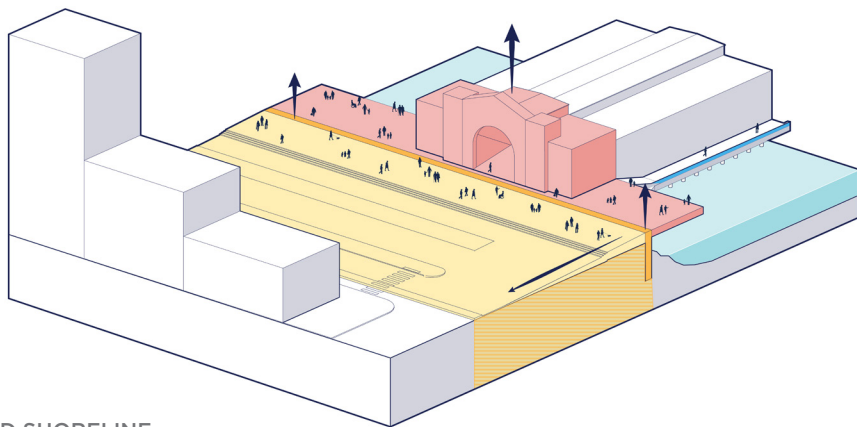
Elevating the shoreline presents an opportunity for new waterfront public spaces. Design details will be developed at later project phases.

Elevate Buildings and Wharves

Elevate buildings and wharves along the water's edge, including the Ferry Building and historic bulkhead buildings. Enhance seismic stability for wharves and buildings.

Add Short Walls Around Piers

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



- 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 Protecton



Transit and utility networks are **defended**

Nature-Based Features



Included as optional elements

EARLY PROJECT (not included in Flood Study)

Piers 9 & 15 Seawall Earthquake Safety Projects will retrofit the bulkhead walls and wharves, Downtown Coastal Resilience Project will improve flood defenses and earthquake resilience in the Ferry Building area 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 Draft 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 Draft Plan proposes a combination of berms/levees, seawalls, nature-based features such as living berms, and closure structures for the bridges. In addition, the Draft Plan proposes adding short floodwalls on piers in this area.

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



Image Credit: Port of San Francisco



Image Credit: Port of San Francisco

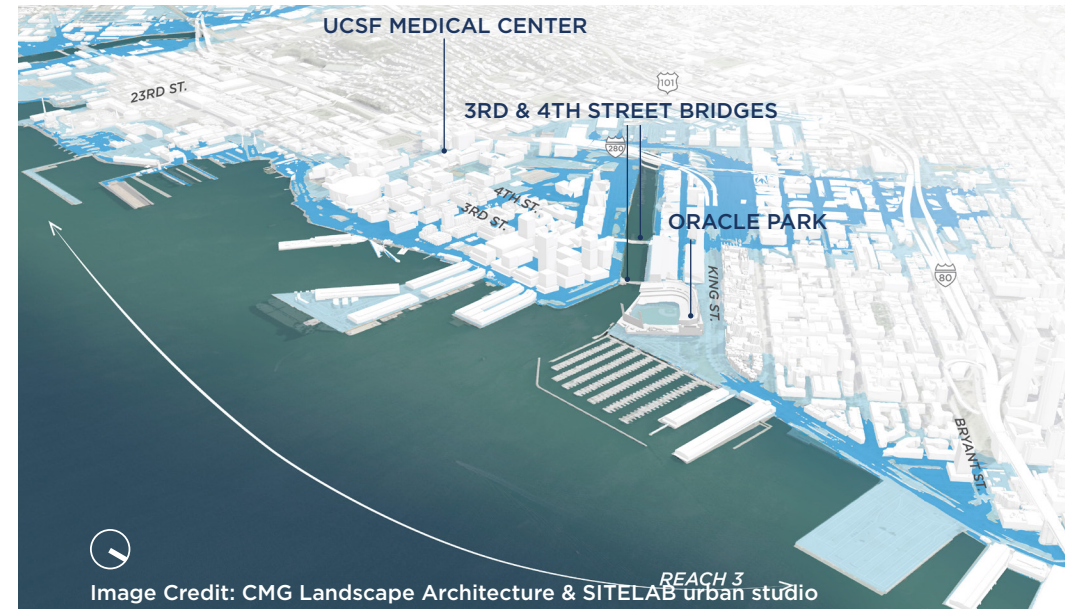


Figure 3.10: South Beach / Mission Bay potential sea level rise by 2100

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

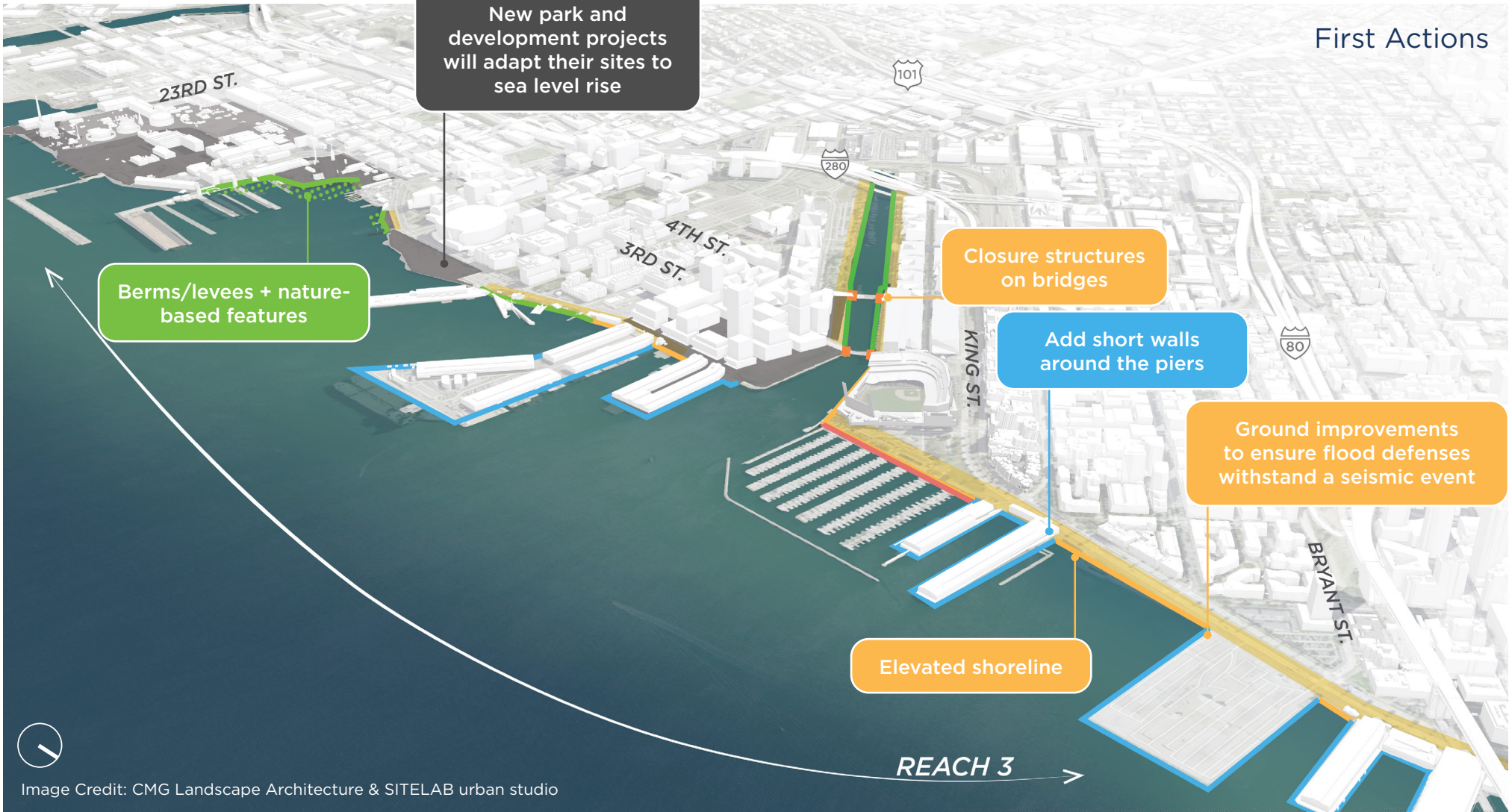


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 3.11: South Beach / Mission Bay Draft Plan

Closure Structure on Bridges

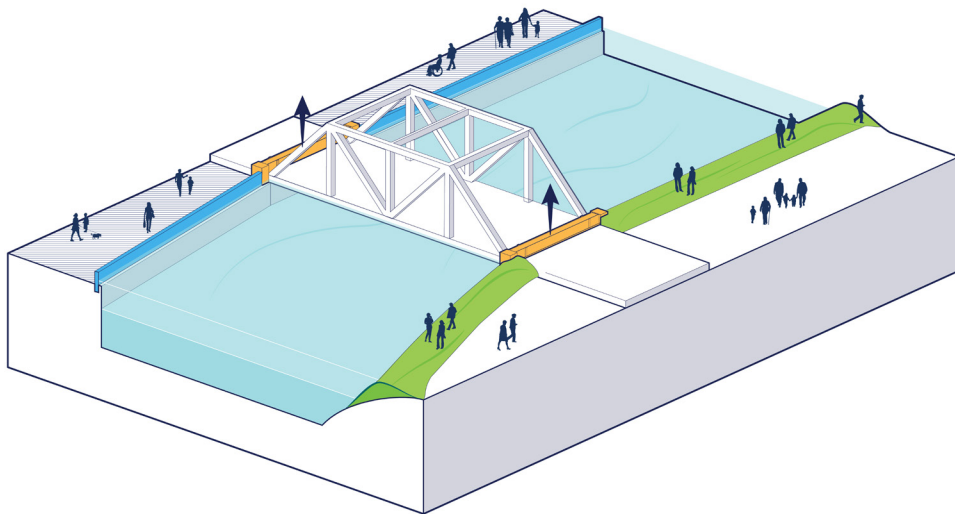
Closure structures on Third and Fourth Street Bridges close gaps in the elevated shoreline to prevent flooding.

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.



- 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 (not included in Flood Study)

- Pier 50 Earthquake Improvement Project – Seismic risk assessment of existing pier and shed structures
- Pier 24 ½ to Pier 28 ½ Seawall Earthquake Safety Project – stabilizing vulnerable portions of the wall and wharf substructures supporting the Promenade

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 Draft 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 Draft Plan proposes a combination of berms/levees, nature-based features such as living berms 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 raised floodwalls 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



Image Credit: Port of San Francisco

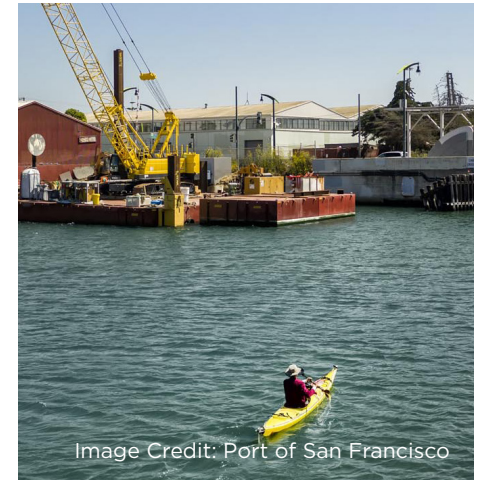


Image Credit: Port of San Francisco

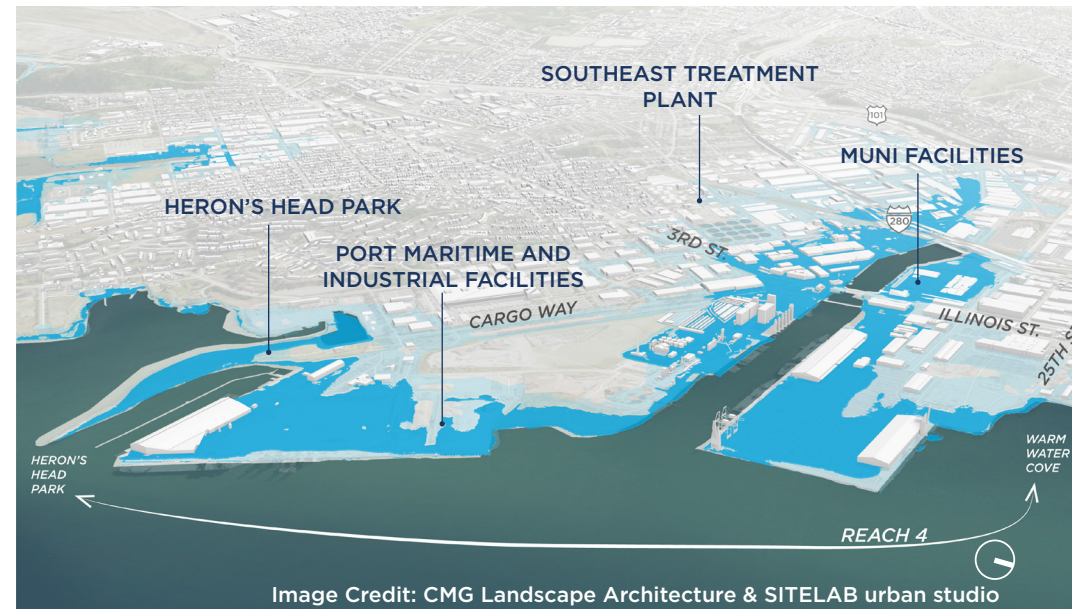


Image Credit: CMG Landscape Architecture & SITELAB urban studio

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

First Actions

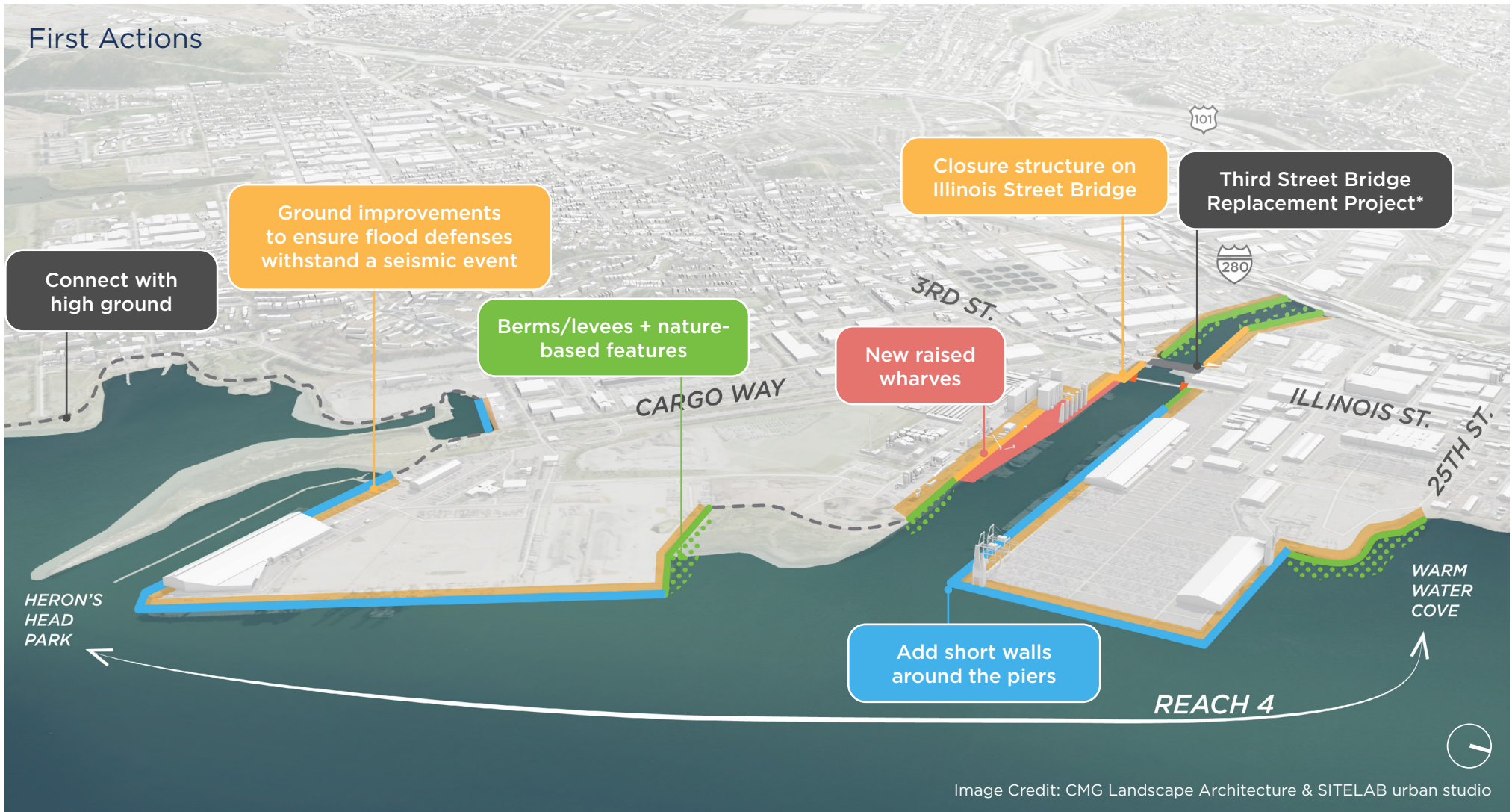


Image Credit: CMG Landscape Architecture & SITELAB urban studio

Figure 3.14: Islais Creek / Bayview Draft 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.

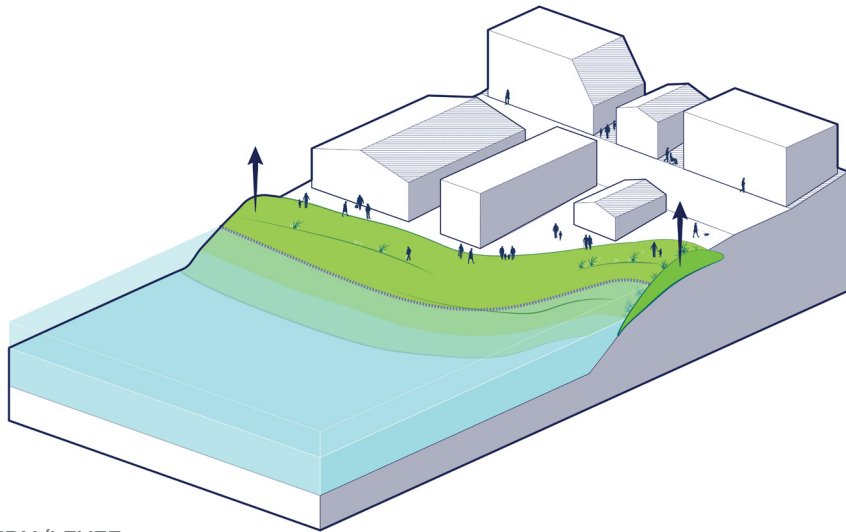
Add Short Walls Around Piers

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/LEEVE

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

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 Public Comment

Image Credit: Port of San Francisco

4.1 WE WANT TO HEAR FROM YOU

USACE and the City are seeking public comment on the **Draft Plan and Environmental Review through March 29, 2024**.

Your public comment on the Draft Plan and Environmental Review can help USACE and the City make decisions about how to:

- ▶ Prepare for coastal flood risks from sea level rise and more intense storms caused by climate change
- ▶ Consider the potential environmental impacts from building coastal flood defenses

Your comment will be included as part of the official record for the Flood Study and will be responded to as appropriate in the Final Report.

Examples of what to comment on:

- ▶ The location, elevation, and type of coastal flood defenses - what do you like or dislike and why?
- ▶ The description of the existing conditions and analysis of potential impacts

How can you provide a comment?

There are several ways that you can add a comment!

1. Join USACE and the City for one of several upcoming community workshops being hosted along the waterfront. Each meeting will include the same presentation. Comment cards will be available, and a station will be set up to record verbal comments as well. Learn more at sfport.com/wrp.
2. Share written comments via email: SFWFRS@usace.army.mil
3. Share written comments via mail: U.S. Army Corps of Engineers, Tulsa District ATTN: RPEC-SFWS, 2488 E 81st St., Tulsa, OK 74137
4. Share written comments online: learn more and comment online at sfport.com/wrp

4.2 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.

To submit public comment

