Waterfront Resilience Program Update

Port Commission Agenda Item 10.B

August 8, 2023

AGENDA

- Waterfront Resilience Program
- Short and Long-Term Adaptation
- Community Engagement Summary
- Updates on the Coastal Flood Study with U.S. Army Corps of Engineers
- What's Next

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WATERFRONT RESILIENCE PROGRAM VISION STATEMENT

The Port's Waterfront Resilience Program will take actions to **reduce seismic and climate change risks** that support a safe, equitable, sustainable, and vibrant waterfront.

RISING TO THE CHALLENGE - BACKGROUND

San Francisco Faces Urgent Seismic, Coastal, and Inland Flood Risks Today

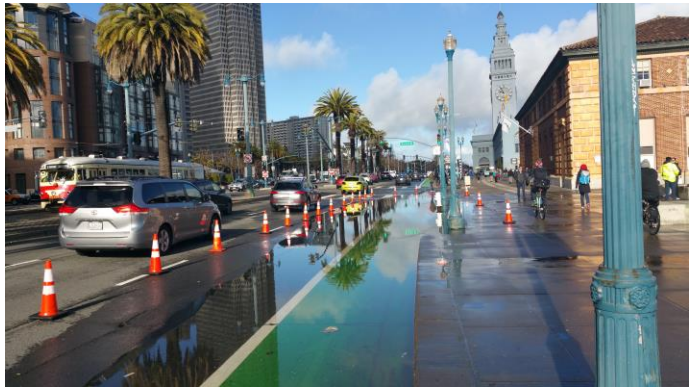
SEISMIC RISKS

San Francisco, 1906

Marina, 1989

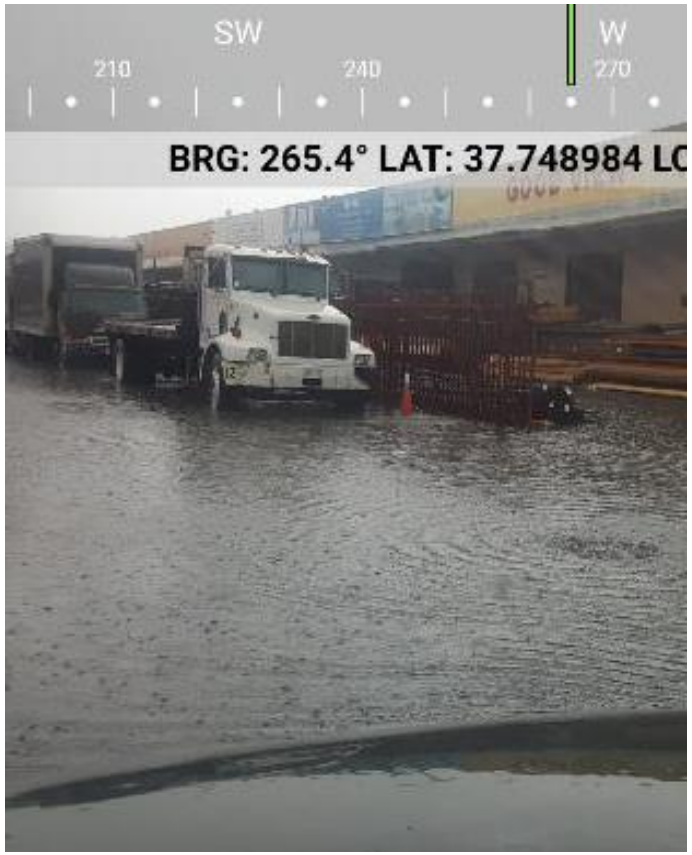
COASTAL FLOODING

Recology



The Embarcadero

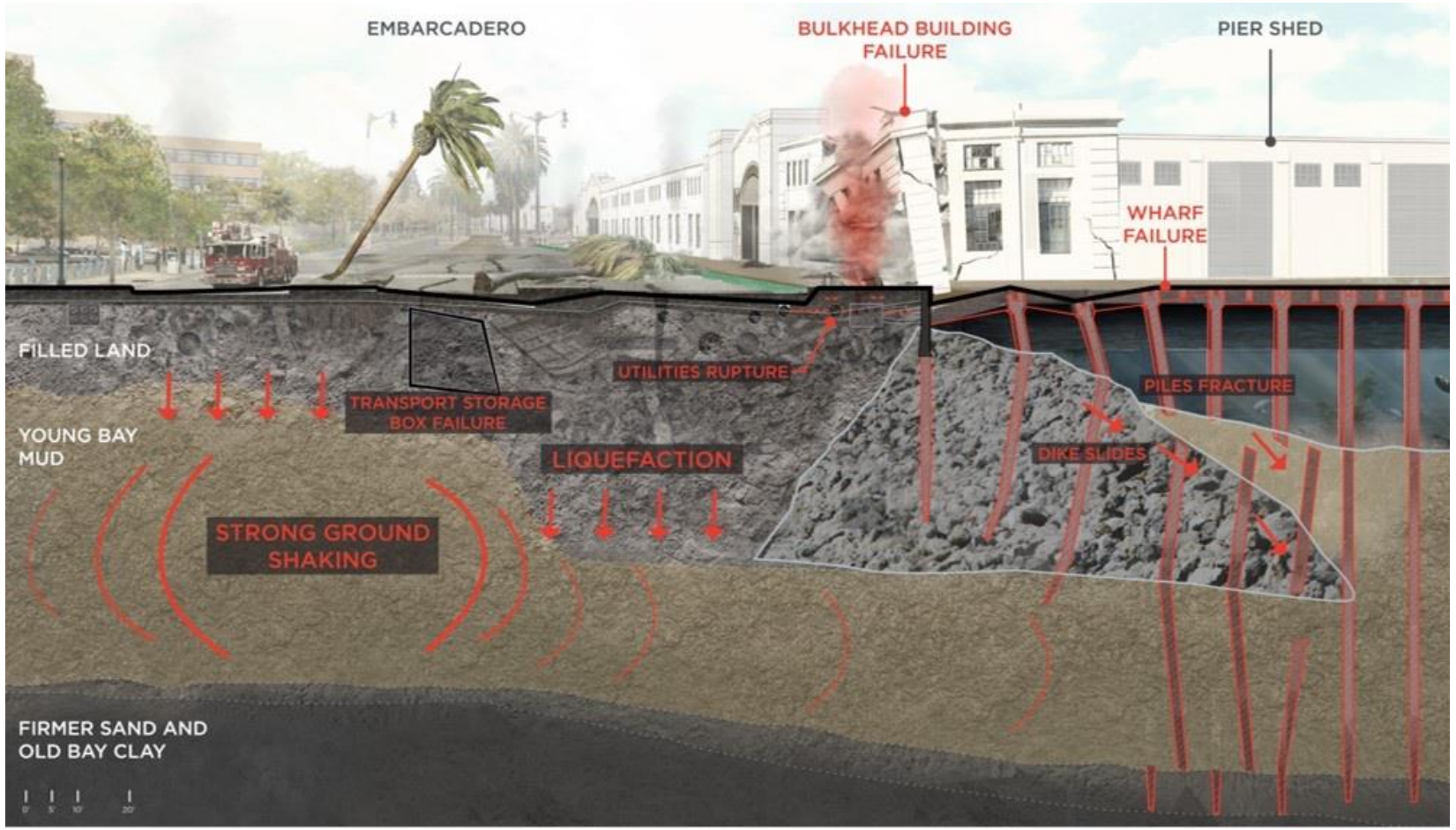
INLAND FLOODING



Islais Creek outfall and Marin St.

Earthquake Hazards

Shaking, Liquefaction, Lateral Spreading



Multi-Hazard Risk Assessment, Port of San Francisco, 2020

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RISING TO THE CHALLENGE

Initiatives Underway

- **Prop A Embarcadero Seawall Bond** funds are being leveraged to match federal grant opportunities
- **Key studies** along the Embarcadero and in Islais Creek are helping us plan with data instead of guessing what's happening underneath the waterfront
- **Embarcadero Early Projects** are under development, with construction starting in 2024
- **Longer-term adaptation planning** is underway
- **Innovative solutions** like the Living Seawall Pilot are being explored

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Short and Long-Term Adaptation

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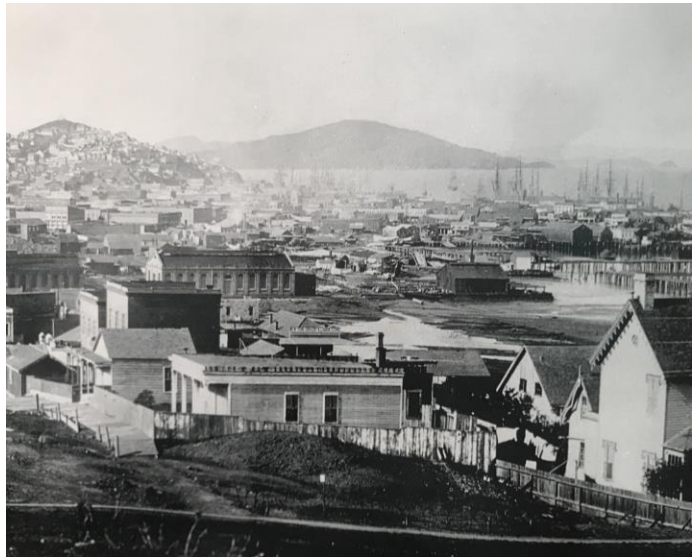
Waterfront Resilience Program

SAN FRANCISCO'S BELOVED WATERFRONT HAS CHANGED OVER TIME



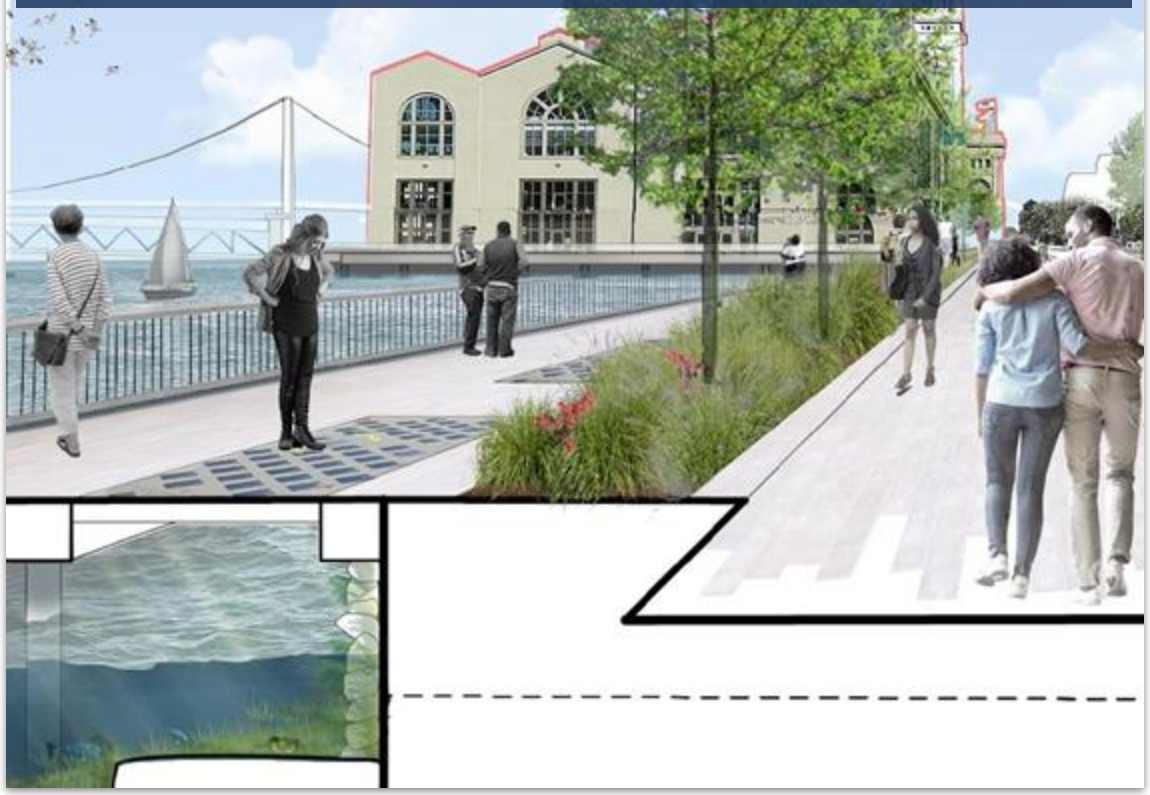
A WATERSHED MOMENT FOR OUR CITY

1877 Agreement on the Waterfront Line

The State Commission and Port of San Francisco agreed on the location of the waterfront line that began 40+ years of investment in the Embarcadero Seawall and piers.

Waterfront Resilience Program

The Federal Government and Port of San Francisco embark on the next major shift of the city's waterfront line, to address flooding and sea level rise and mitigate seismic risk.



EMBARCADERO EARLY PROJECTS

2	Wharf J9 Replacement and Resilient Shoreline Project
11	Pier 15 Bulkhead Wall and Wharf Earthquake Safety Retrofit
12	Pier 9 Bulkhead Wall and Wharf Earthquake Safety Retrofit
15	Ferry Building Seawall & Substructure Earthquake Reliability
17	Downtown Coastal Resilience Project
18	Pier 24 to Pier 28-1/2 Bulkhead Wall and Wharf Earthquake Safety
22	EFWS Fireboat Manifold Earthquake Resilience Project (P35.5)

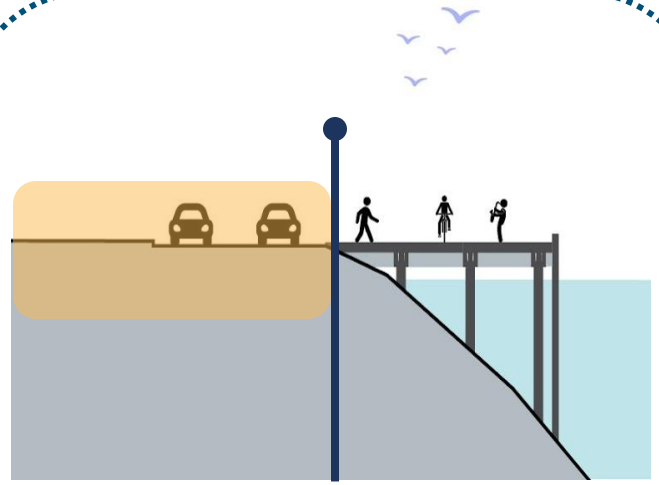
23 Embarcadero Early Projects Identified

- **6** advanced to pre-design using Proposition A funding
- **5** advancing to pre-design through a geographic strategy for the stretch between Piers 19 and 41
- **7** advancing through coordination with long-term Port tenants, capital programs, and City agency coordination

- **2** Southern Waterfront early projects identified to advance at Pier 50 and Pier 94-96.

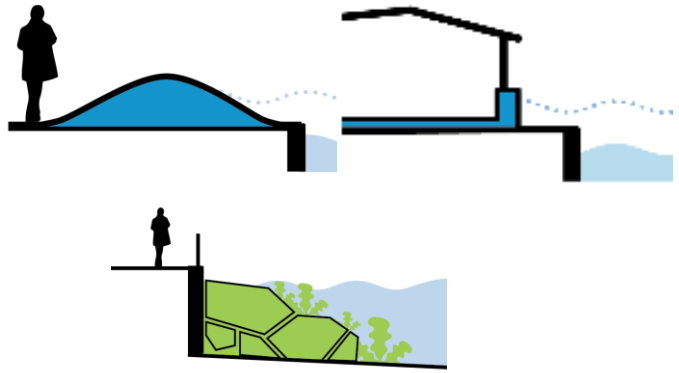
LONGER-TERM ADAPTATION PLANNING

Goal: Develop plans to guide WRP long-term resilience efforts and work with USACE to complete the SF Waterfront Coastal Flood Study



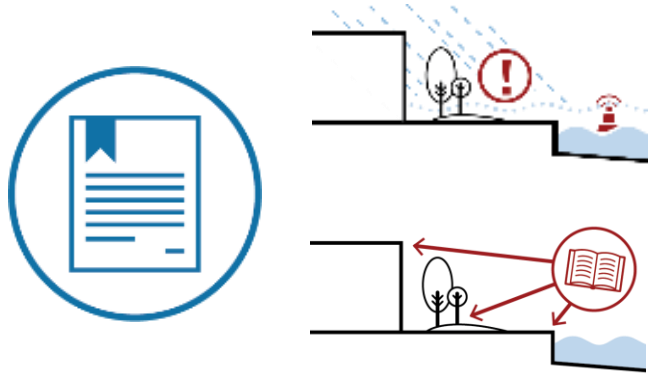
Coastal Flood Defense Location + Height

And area of elevation change



Physical Changes

Such as seawalls, berms, floodproofing, and nature-based features



Policy Changes

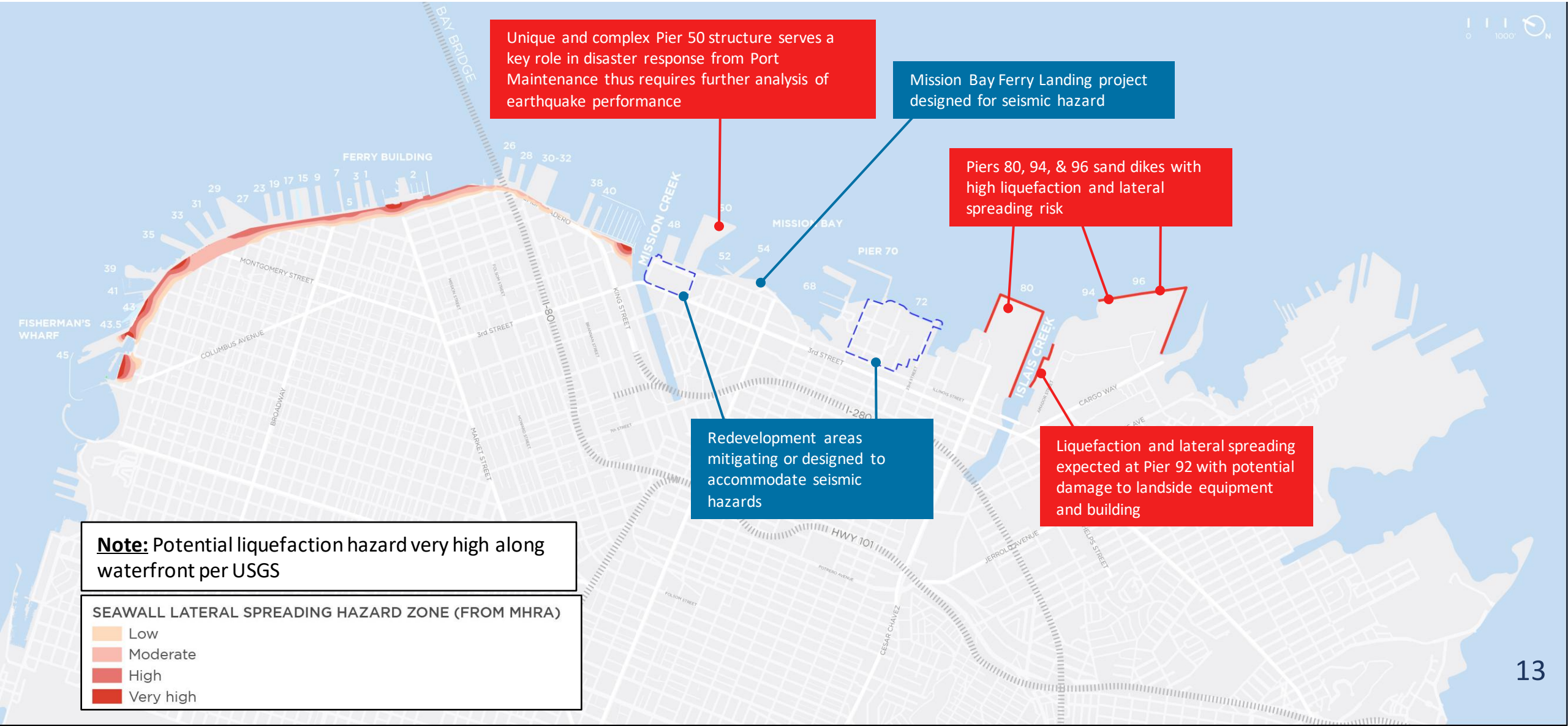
Such as resilient codes, warning systems, and land use changes

COASTAL AND INLAND FLOOD RISK

Different Geographic Impacts

WATERFRONT SEISMIC HAZARDS

Potential Lateral Spread and Liquefaction Risk



Note: Potential liquefaction hazard very high along waterfront per USGS

ADAPTATION APPROACHES

DEFEND

Keep coastal water out,
stay in place

ACCOMMODATE

Let coastal water in,
stay in place

RETREAT

Move out of the area
over time

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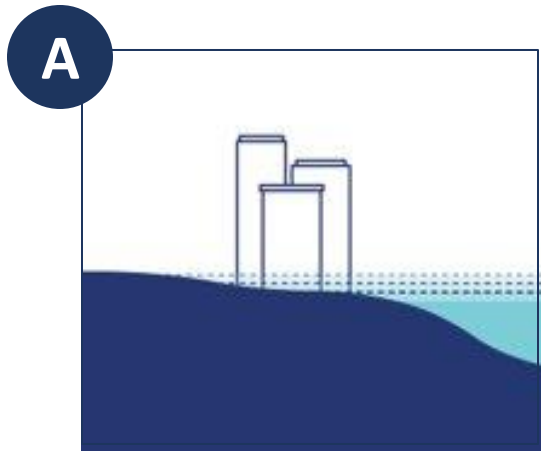
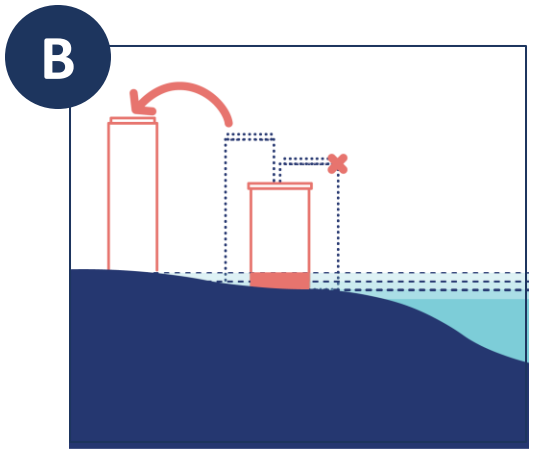
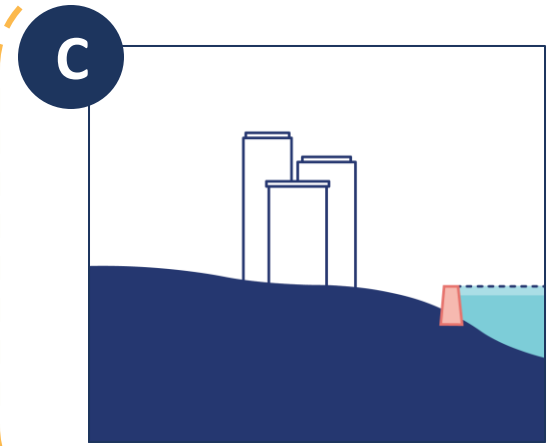
DRAFT WATERFRONT ADAPTATION STRATEGIES



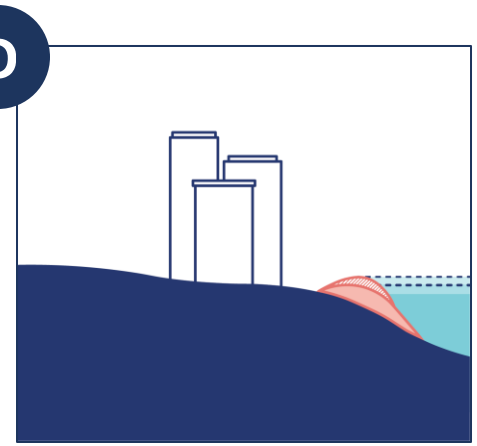
No Action



Non-Structural

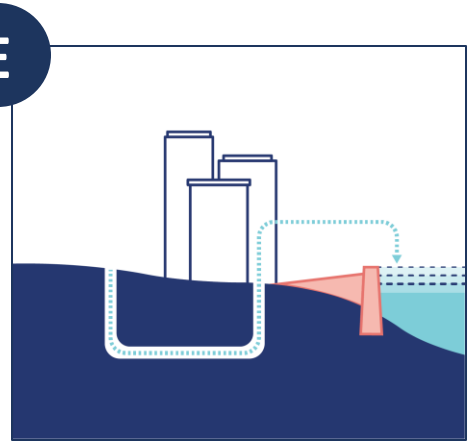


Lower Sea Level Rise

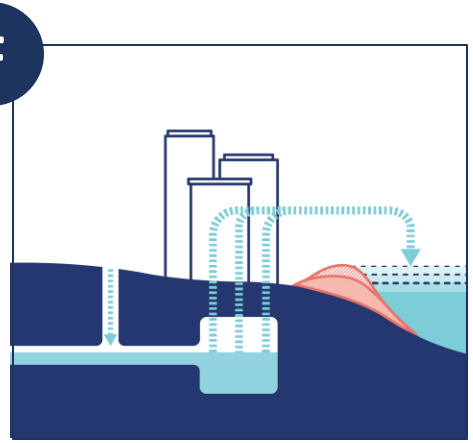


Adaptable

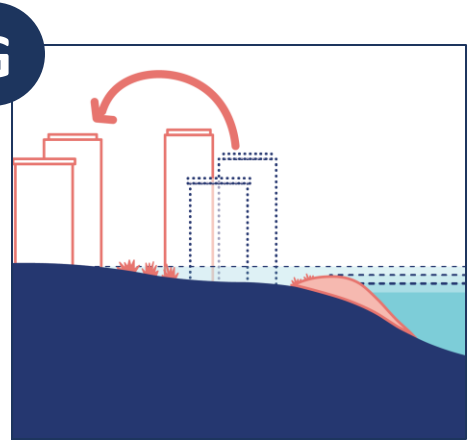
Lower Rate of Sea Level Rise



Hold The Line



Manage The Water



Align With Watersheds

Higher Rate of Sea Level Rise

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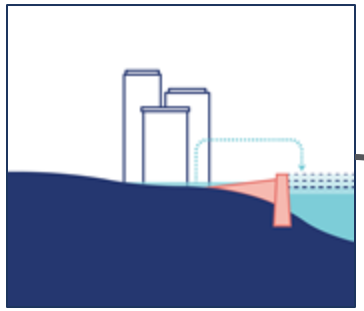
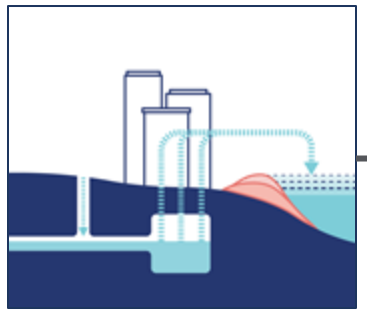
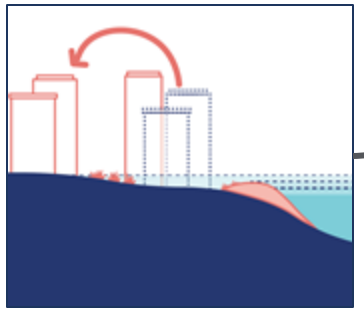
GETTING TO DRAFT WATERFRONT ADAPTATION PLANS
Mix and Match Best Elements of Each Strategy







Assessment & Feedback

Public and Community Feedback

Regulatory Standards

Agency Feedback

Technical Evaluation

Cost Benefit Analysis

Equity Framework

DRAFT PLANS
Comprehensive Benefits Plan and Locally Preferred Plan

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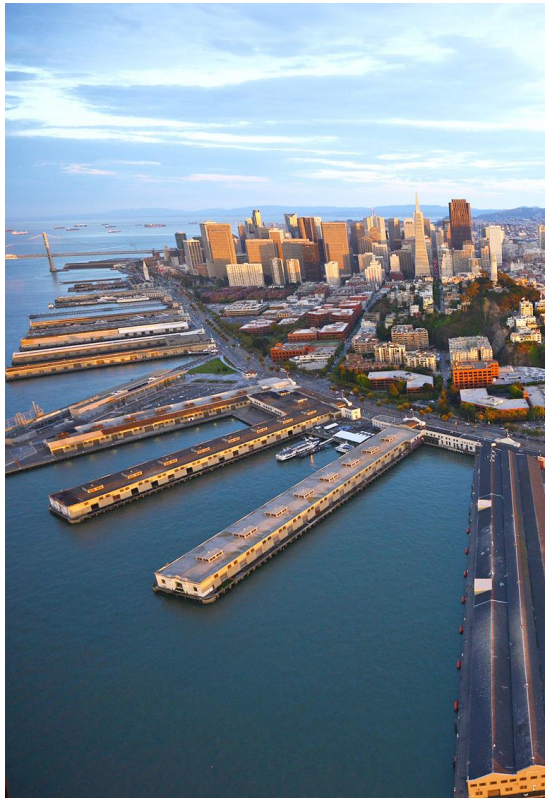
WATERFRONT RESILIENCE PROGRAM PARTNERS

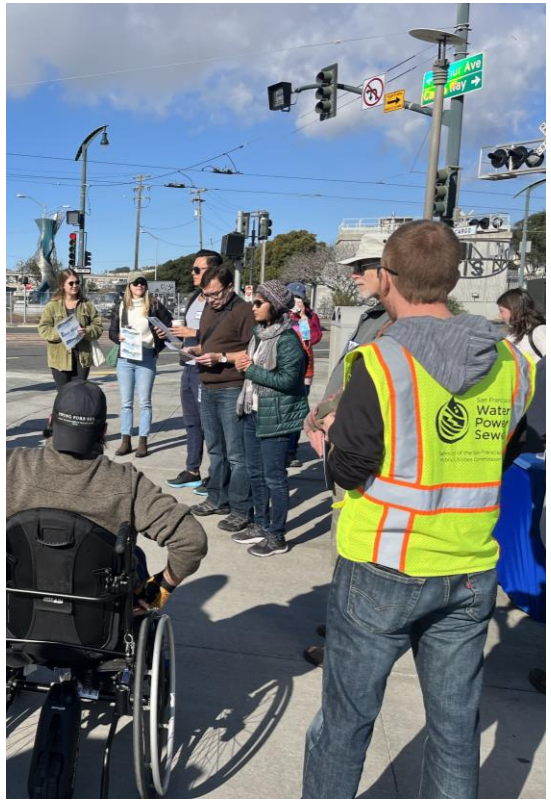
Port team working in close coordination with key partners

WATERFRONT RESILIENCE PROGRAM PARTNERS

Working Groups



Resource Agency Working Group



Equity Working Group

Engineering with Nature Working Group

Historic Preservation Technical Advisory Committee

Community Engagement

COMMUNITY INPUT HELPED DEFINE THE WRP

Community-driven resilience

1. **Focus on life safety & emergency response**

2. **Prioritize assets most loved by the community and most important to the city**

3. **Put people first**

   Assets and services most prioritized: housing, disaster recovery facilities, utilities, transportation and businesses

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DRAFT STRATEGIES – PUBLIC ENGAGEMENT

October 2022 – February 2023

Engagement included:

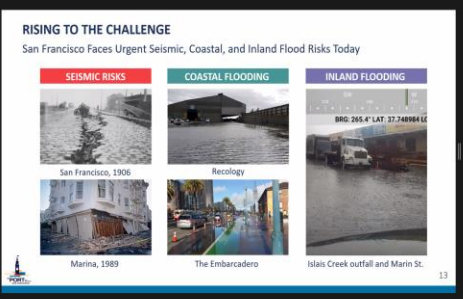
- **16 events** open to the public: online community meetings, waterfront walking tours
- **Southern Waterfront** in-person open-house & in-person mixer,
- **Multiple focus groups** and presentations to Community Organizations and Community Advisory Councils
- **StoryMaps, Social Media, Emails, Video**

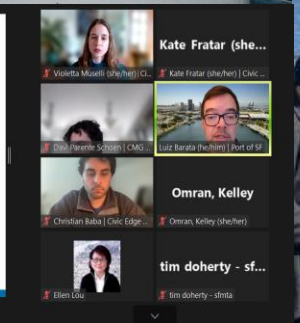
DRAFT STRATEGIES – PUBLIC ENGAGEMENT

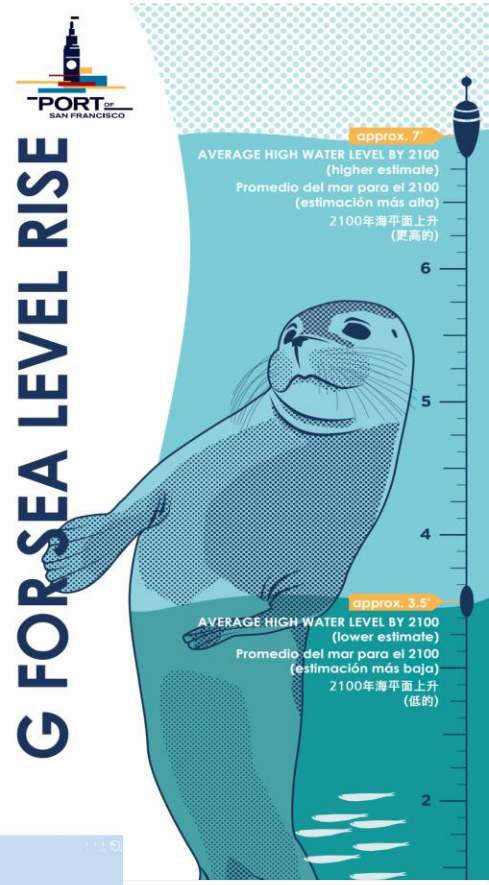
502 people participated across all events

DRAFT STRATEGIES – PUBLIC ENGAGEMENT

Over 170,000 people viewed content related to draft strategies







WHAT WE HEARD OVERALL

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 high priority for community members, no matter the strategy.
- **Overall, there was no strong preference for any one strategy over another when selecting between strategies E, F, and G. Pros and Cons very identified for each.**
- Community members raised many concerns in response to the draft strategies. **Common concerns ranged from equity and environmental justice implications, to technical practicalities, to questions about cost and feasibility.**

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UPCOMING SOUTHERN WATERFRONT ENGAGEMENT

Summer – Fall 2023

- **Filling the Gaps - A "Learning Surge" -** high profile, high-impact community activities for youth, businesses, renters in public housing, and faith-focused residents
- **Partnerships with community influencers in** priority community audiences, including: youth, business, faith-focused, senior, and public housing renters

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S.F. Waterfront Coastal Flood Study with the U.S. Army Corps of Engineers

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Waterfront Resilience Program

SAN FRANCISCO WATERFRONT COASTAL FLOOD STUDY

US Army Corps of Engineers®

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If USACE finds a Federal interest, this Study can lead to federal funding to help design and build coastal flood defenses for 7½ miles of bay waterfront.

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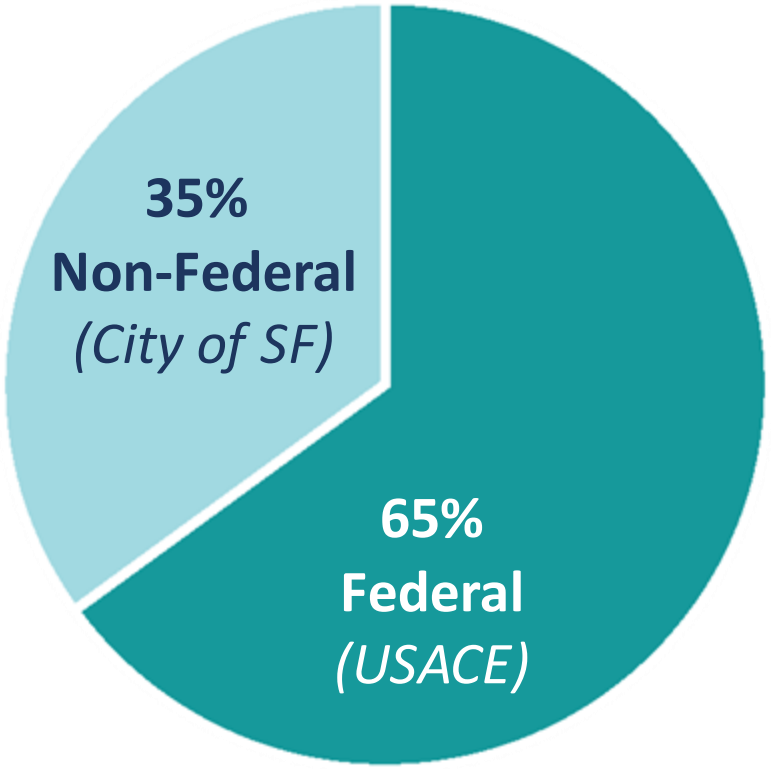
PROJECT COSTS

To address the risks and hazards that the city faces:

Total Cost: **$ Billions**

Project Cost Sharing



PROJECT BENEFITS

Benefits are calculated across multiple accounts:

National Economic Development

- Total Project Cost
- Physical Damages
- Non-Physical Damages
- Loss of Land

Regional Economic Development

- Business Economic Disruptions
- Population Economic Impacts

Other Social Effects

- Health & Safety
- Economic Vitality
- Social Connectedness
- Community Identity
- Social Vulnerability and Resilience
- Disproportionate Effects

Environmental Quality

- Physical Environment
- Biological Environment

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Other Social Effects

FWP Analysis Approach – **Social Vulnerability**

CATEGORY	OSE METRIC
Economic Vitality	Businesses
	In Labor Force
	Median Household Income
	Income - per capita
	Not In Labor Force
	Owner Occupied - Units
	Median Gross Rent
	Jobs
	Total Households
	Total Housing - Units
Health and Safety	Asthma
	Cardiovascular
	Total Population

CATEGORY	OSE METRIC
Social Connectedness	Using Public Transportation (No Vechicle in Household)
	Travel Time - Over 30 min
	Travel Time - Under 30 min
	Work Transit - Car, Truck, Van
	Work Transit - Public Transportation
Social Vulnerability and Resiliency	Age - Over 65
	Age - Under 18
	Age Under 18/Over 65
	Education - Only HS Degree
	Households - Poverty
	Households - with Disability
	Individuals - Poverty
	Linguistic Isolation
	Low Birth Weight
	Race - Non-white
	Race - White
	Renter Occupied - Units
	Single Parent

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PRIORITIZING EQUITY IN BOTH…

PLANNING PROCESS

- Collaborate with equity practitioners from city agencies to draw out equity considerations of strategies
- Develop an equity framework to support evaluation of adaptation strategies
- Vet equity framework with CBO leaders to validate approach in assessing strategies

+

DISTRIBUTION OF PROJECT BENEFITS

- Remedy historic lack of investment in Southeast neighborhoods
- Protect housing and jobs
- Contracting and workforce development opportunities
- Improve public access to the waterfront
- Maintain transit connectivity





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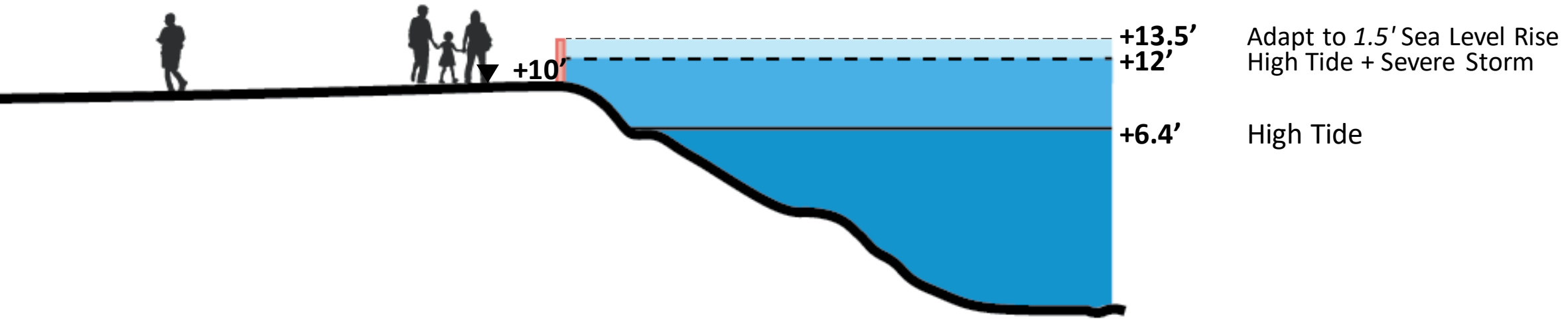
COASTAL FLOOD DEFENSE PRELIMINARY PHASING CONCEPTS

Considering Interim Actions in Many Areas to Address Flood Risk and Spread Out Costs over Time

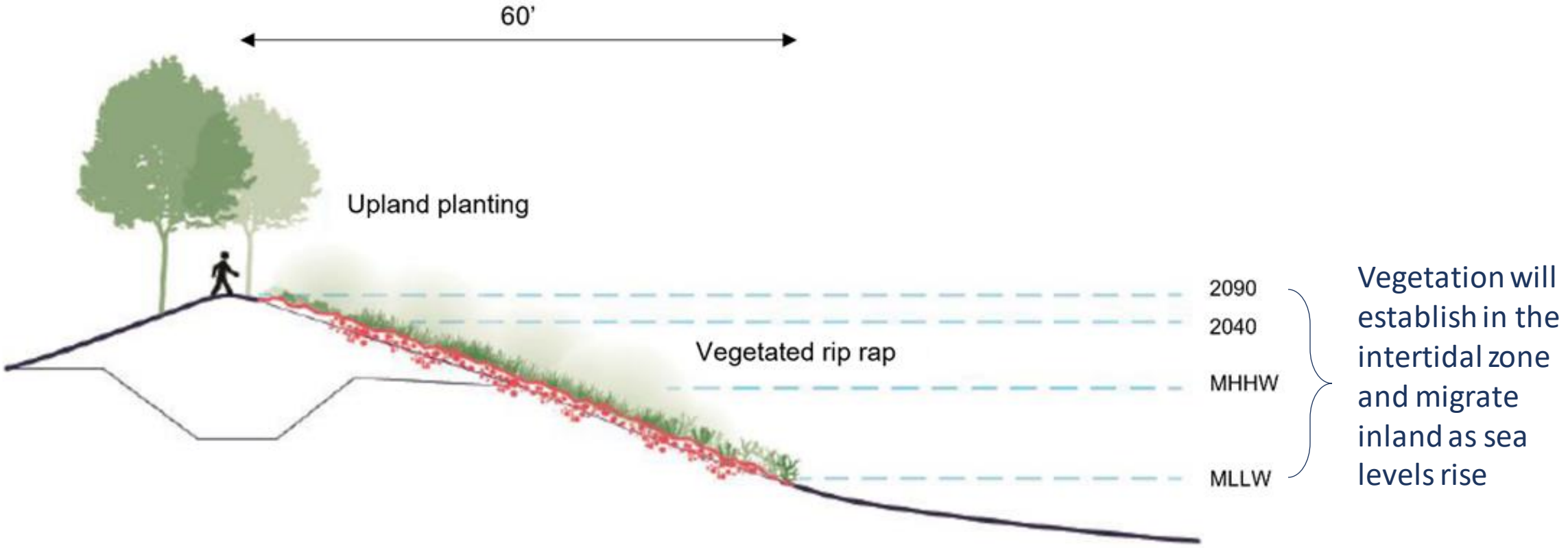


** All elevations are in North American Vertical Datum of 1988*

Environmental Quality

Habitat and Nature

- The range of feasible nature-based features were distributed across alternatives
- Many nature-based features can be mix-and-matched in the Comprehensive Benefits Plan
- Nature-based features may require implementation in phases as sea levels rise

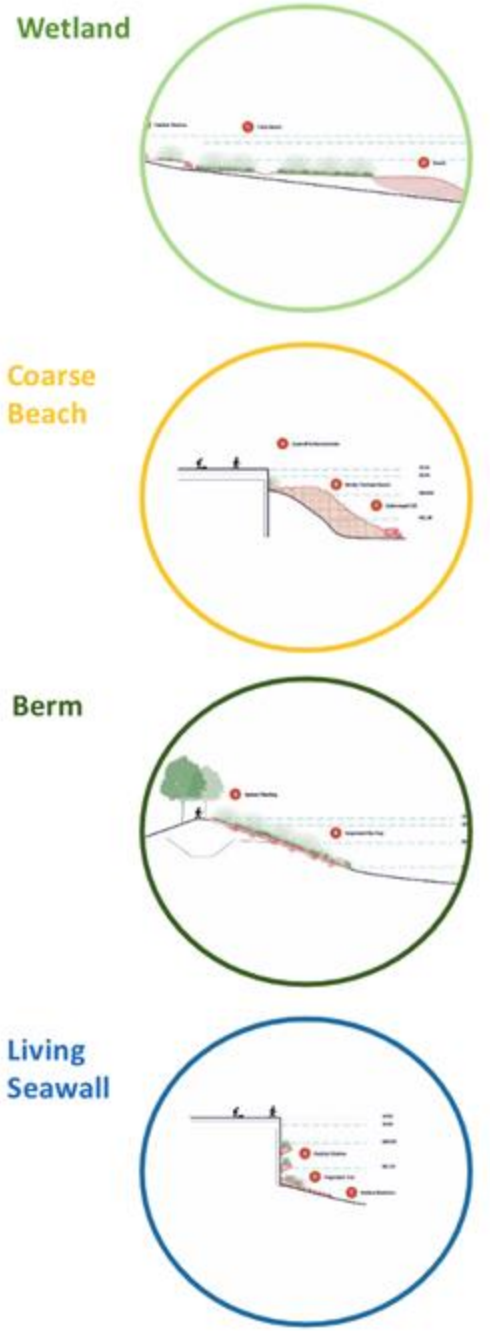


Vegetation will establish in the intertidal zone and migrate inland as sea levels rise

ENGINEERING WITH NATURE

Integration with the Draft Plan

- Engineering with Nature (EWN) integrates nature-based features like wetlands and coarse beaches into adaptation strategies even along predominately engineered shorelines
- EWN can reduce wave hazards, mitigate flood risk, and improve the life span of more typical ‘grey’ infrastructure
- EWN features can vary and be tailored to available space
- Within the Locally Preferred Plan, EWN seeks to enhance existing ecological assets, reduce flood risk, and create improved public open space



ENGINEERING WITH NATURE

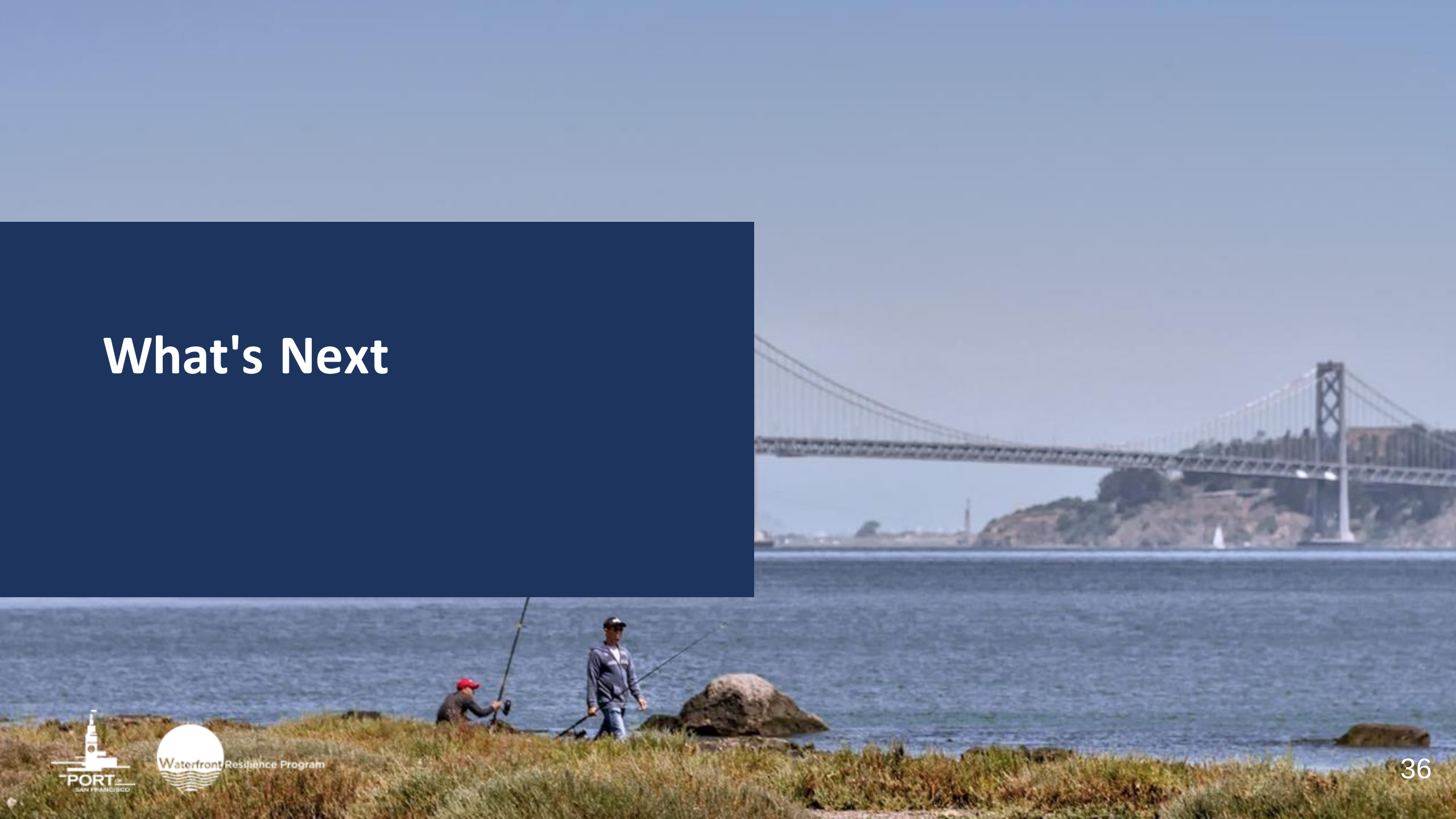
Long term vision: An opportunity to build a new relationship between the city and natural systems

Historic
Varied habitat types across interconnected coastal and riparian systems

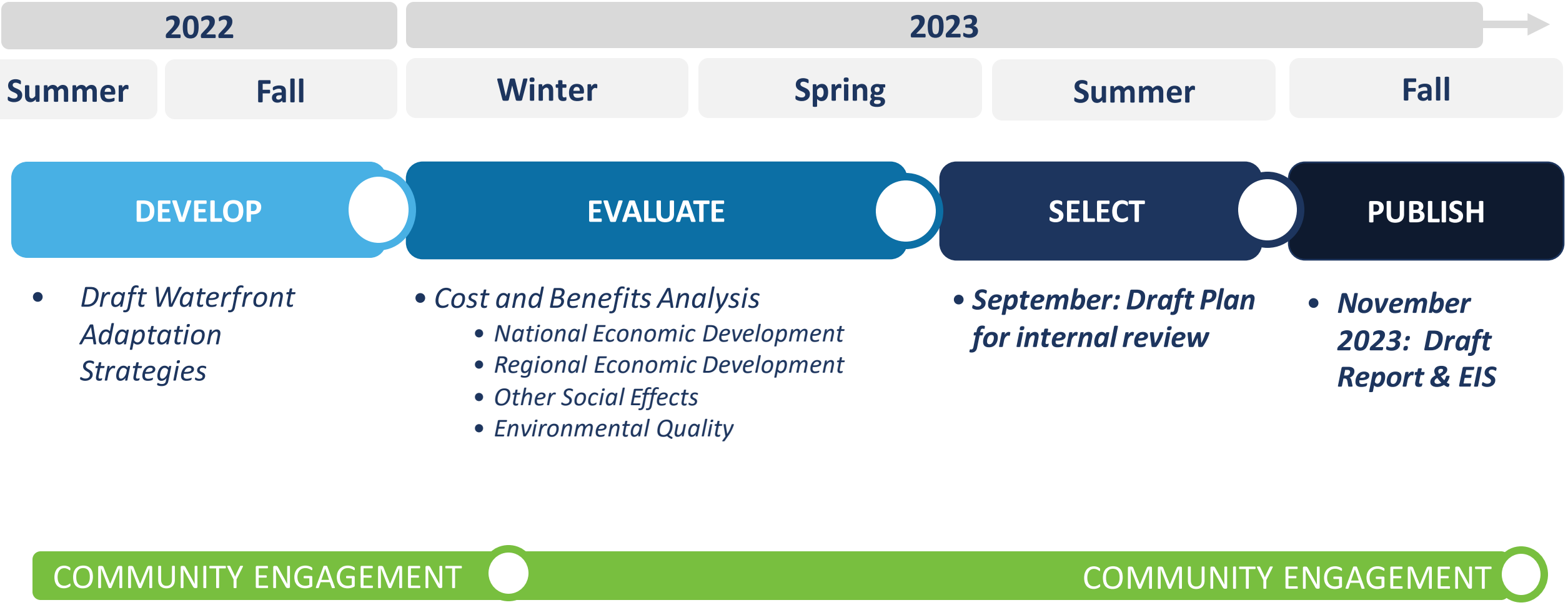
Today
Limited patches of habitat and disconnected environmental systems

Hybrid Opportunity
Layer in naturalized edges, strategically re-connect habitats and restore natural systems

What's Next



FLOOD STUDY SCHEDULE TO DRAFT REPORT



PLANS OF THE USACE FLOOD STUDY PROCESS

National Economic Development (NED) Plan

Plan the maximizes Federal economic interest – conventional USACE approach

Comprehensive Benefits Plan (CBP)

New, broader USACE approach adds Regional Econ Development, Environmental Quality, Social Effects

Locally Preferred Plan (LPP)

Local vision – may include additions and differences from Federal plans

Tentatively Selected Plan (TSP)

Draft of plan that would be the basis of congressional funding request – may include any of the above

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BEYOND INFRASTRUCTURE IMPROVEMENTS

A multi-benefit project, and a once-in-a-generation opportunity to…

Invest radically in the public realm for people

Integrate natural features to begin to restore natural habitats and provide ecological benefits

Protect historically disinvested areas from flooding and earthquakes through an equitable and inclusive process

Thank You

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www.sfport.com/wrp

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Waterfront Resilience Program