



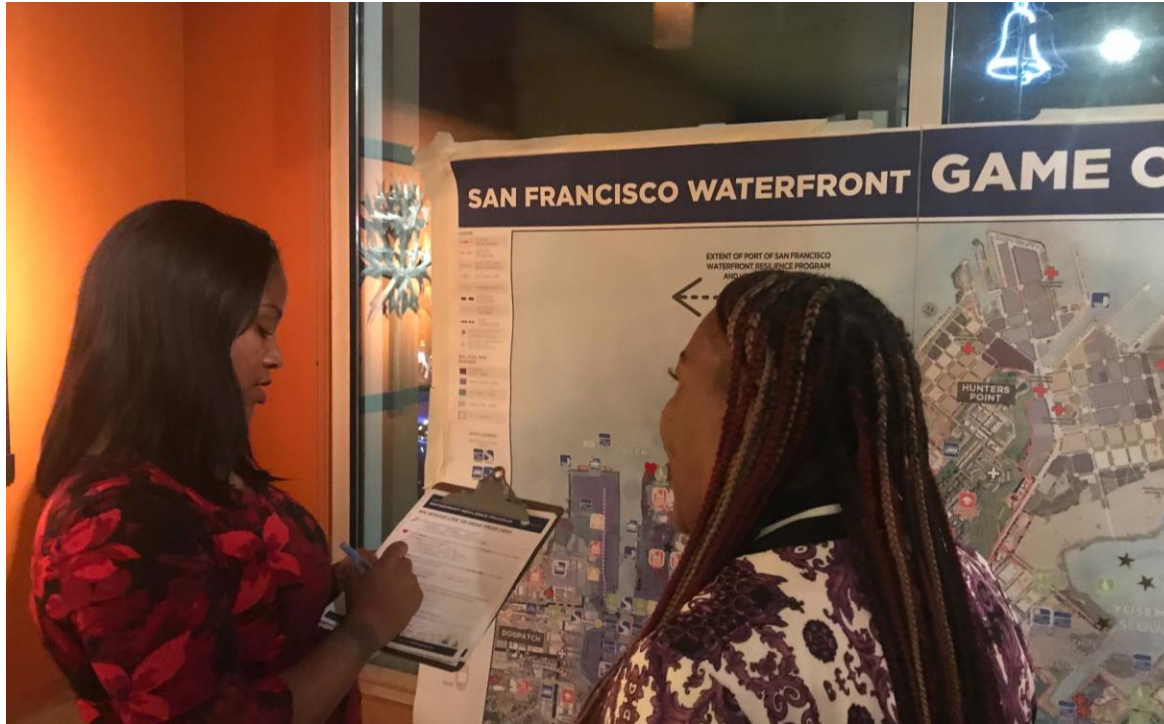
**WATERFRONT RESILIENCE
PROGRAM UPDATE**
Bayview Merchants Association
November 17, 2020



Waterfront Resilience Program

TODAY'S AGENDA

Presentation Overview



- Overview of the Waterfront Resilience Program
- Embarcadero Seawall Program Update
- USACE Flood Resiliency Study Update
- Measures and alternatives to reduce the risks
- Key priorities from community and stakeholder engagement
- Next steps

WATERFRONT RESILIENCE PROGRAM

Goal 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.



WATERFRONT RESILIENCE PROGRAM DRAFT PRINCIPLES

Affirmed through Robust Community Engagement

- **Prioritize** life safety and emergency response
- **Advance** equity throughout the Waterfront Resilience Program, including through community and stakeholder engagement, planning, contracting, jobs and decision-making
- **Enhance** and sustain economic and ecological opportunities
- **Inspire** an adaptable waterfront that:
 - Improves the health of the Bay
 - Ensures public access to the waterfront and historic places and an inviting waterfront for all
 - Protects and preserves historic and maritime resources
 - Provides opportunities for diverse families, businesses, and neighborhoods to thrive
- **Lead** a transparent, innovative, collaborative, and adaptive Resilience Program



WATERFRONT RESILIENCE PROGRAM EFFORTS

Program and City Resilience Projects and Efforts





Embarcadero Seawall Program

Update and Key Findings from the Multi-Hazard Risk Assessment (MHRA)

EMBARCADERO SEAWALL PROGRAM

Program Overview



- **Project Area:** Fisherman's Wharf to Mission Creek
- **Timing:** 2017 to 2021 project planning followed by implementation / construction
- **Focus:** Seismic and flood risk associated with the Embarcadero Seawall
- **Funding:** \$425 million General Obligation Bond passed in November 2018

WHAT IS THE MULTI-HAZARD RISK ASSESSMENT (MHRA)?

Proposition A Required a Detailed Safety Assessment of the Embarcadero

Refined investigation of flood and seismic hazards along the Embarcadero Seawall, from Fisherman's Wharf to Mission Creek

SAN FRANCISCO BAY



- Range of seismic hazards assessed within Embarcadero Seawall area
- Range of flood hazard scenarios assessed including impacts to critical City infrastructure
- Methodology: Bored holes and used lasers to uncover what is happening under the Bay and worked closely with agency partners to understand impacts to assets and services that the City and the region rely upon

HAZARDS AND CONSEQUENCES

MHRA Key Findings

Up to **\$30 billion** cost of damages and disruption from **combined seismic and flood risk by 2100**



Lower lateral spread risk south of Bay Bridge



Ferry Building Area:
Significant seismic risk



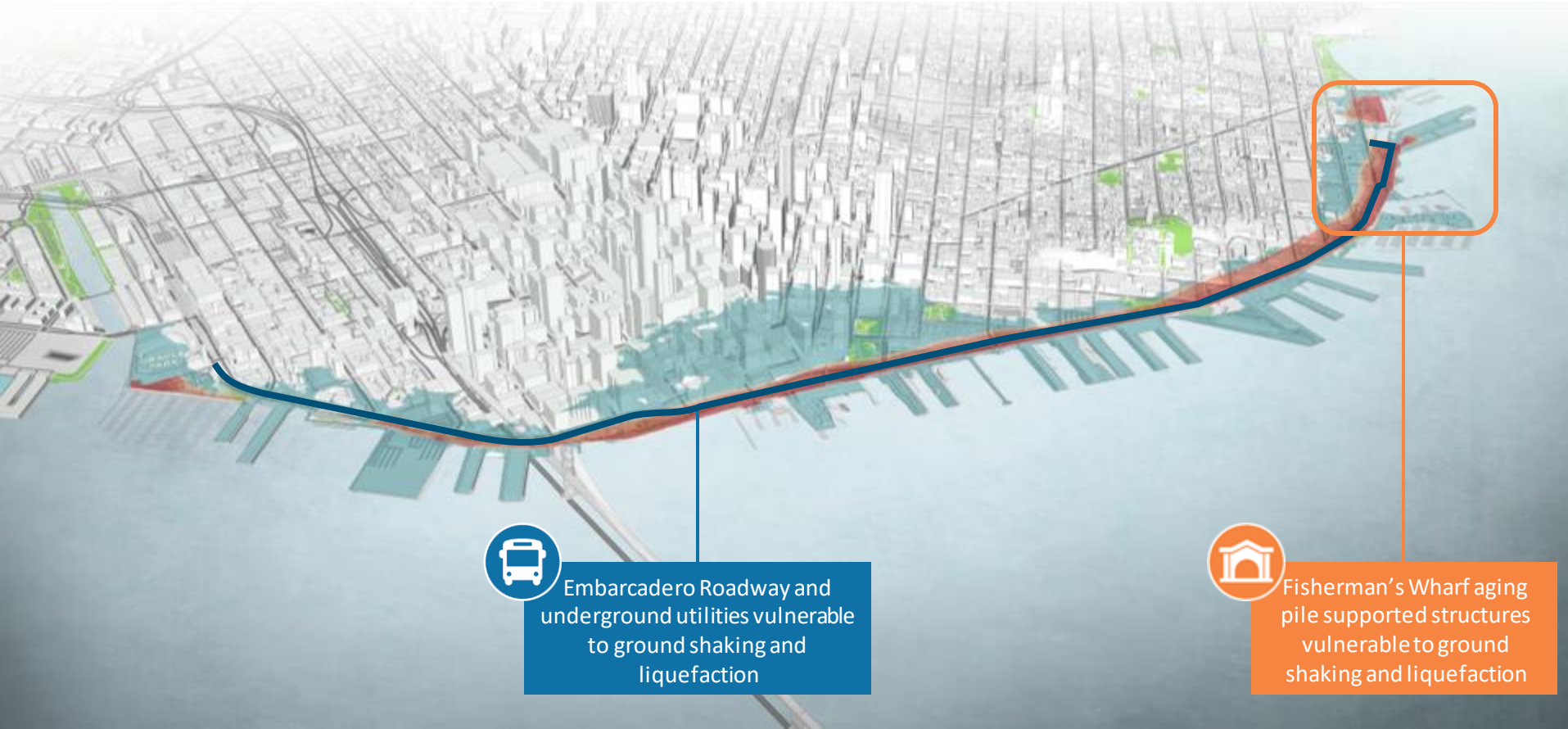
Entire Embarcadero:
Significant flood risk
between 2 and 3 feet
of sea level rise



Bulkhead wharves
and buildings at
greatest seismic risk

OTHER EARTHQUAKE HAZARDS AND CONSEQUENCES

MHRA Key Findings



Embarcadero Roadway and underground utilities vulnerable to ground shaking and liquefaction



Fisherman's Wharf aging pile supported structures vulnerable to ground shaking and liquefaction

USACE Flood Resiliency Study

Overview and Update



USACE FLOOD RESILIENCY STUDY

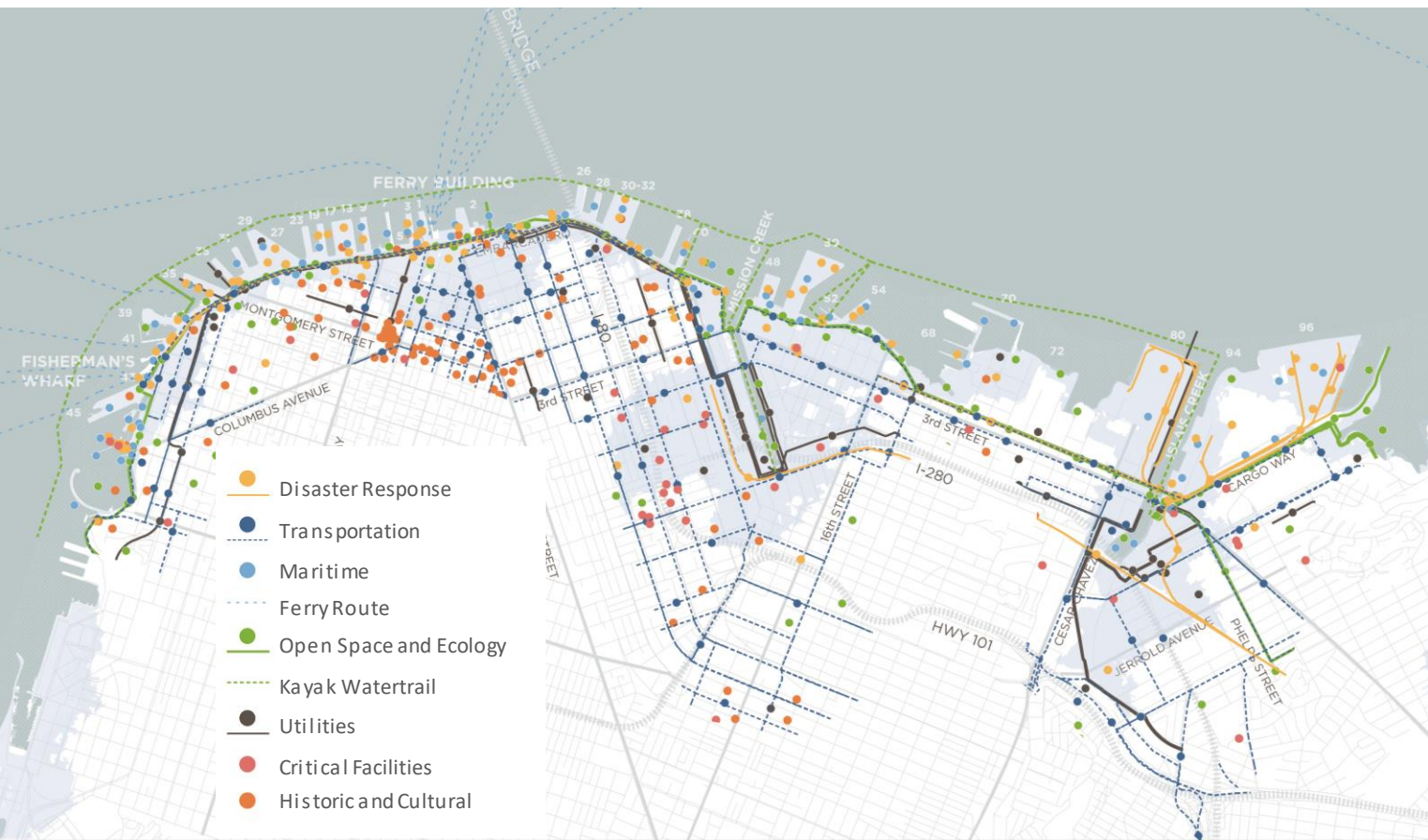
Overview and Key Highlights



- Port is local sponsor
- 5 to 6 year study
- Flood risk assessment
- Robust community and stakeholder input
- If USACE finds a Federal interest and Congress authorizes a Project:
 - Design/construction of project cost-shared
65% Federal, 35% Local

USACE FLOOD RESILIENCE STUDY ASSESSMENT

Study Wide



Assets at risk include more than:

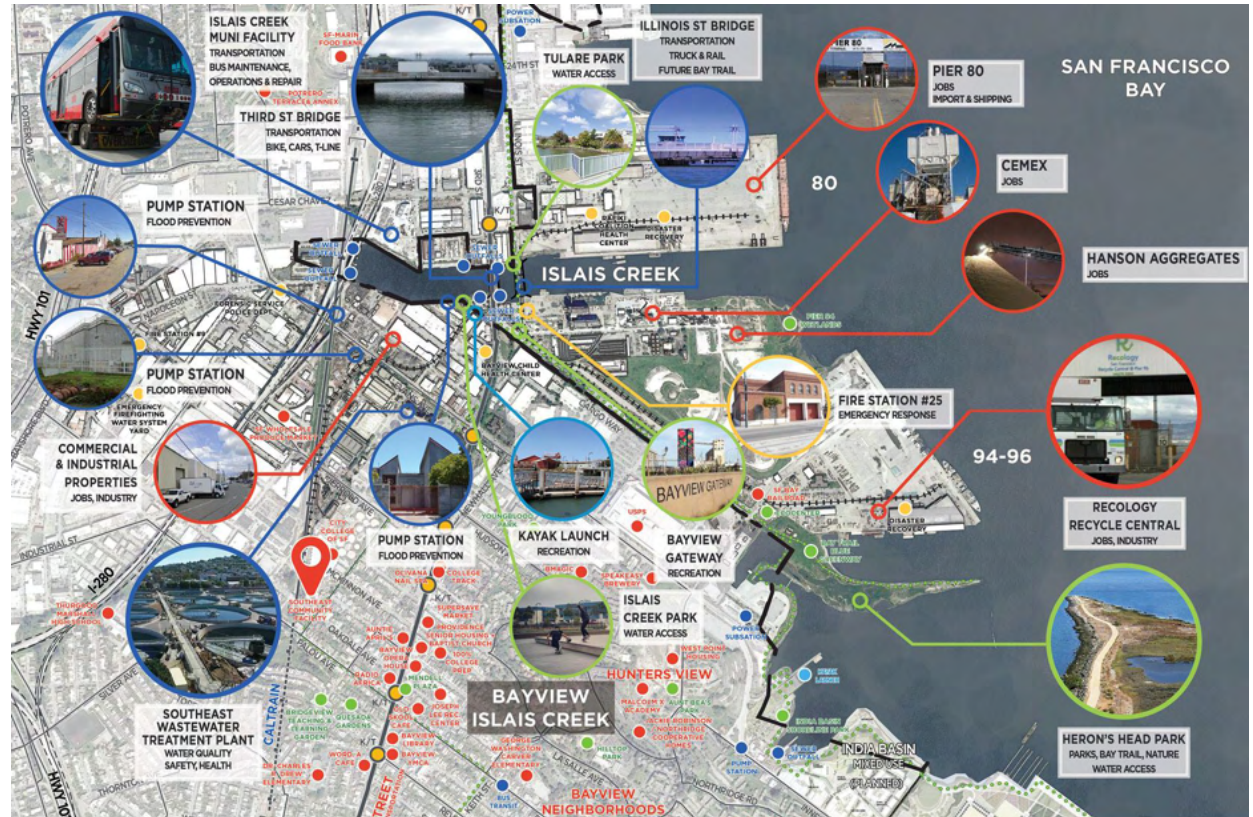
- 40 miles of roadway
- 25 miles of muni & cable car track
- 5 miles of freight railway
- 6 fire stations
- Dozens of other critical facilities
- 11,000 jobs
- 360,000 regional commuters
- 2,600 residential and commercial buildings
- 13,500 residents, 58% people of color
- Wastewater functions for 580,000 residents

FLOOD RESILIENCE STUDY ASSESSMENT

Islais Creek

Collaborated with City partners, Port tenants and other stakeholders to:

- Assign value to physical infrastructure
- Estimate impact of disruption and downtime for businesses and services
- Evaluate vulnerability of each asset to flood risk based on water depth
- Compile exhaustive database of all assets within the flood plain for use in the planning model



USACE FLOOD RESILIENCE STUDY ASSESSMENT

Near Term/High Likelihood

- Areas that will flood earlier in the study period carry more weight in the flood damage assessment because of their high likelihood of flood risk in the near term

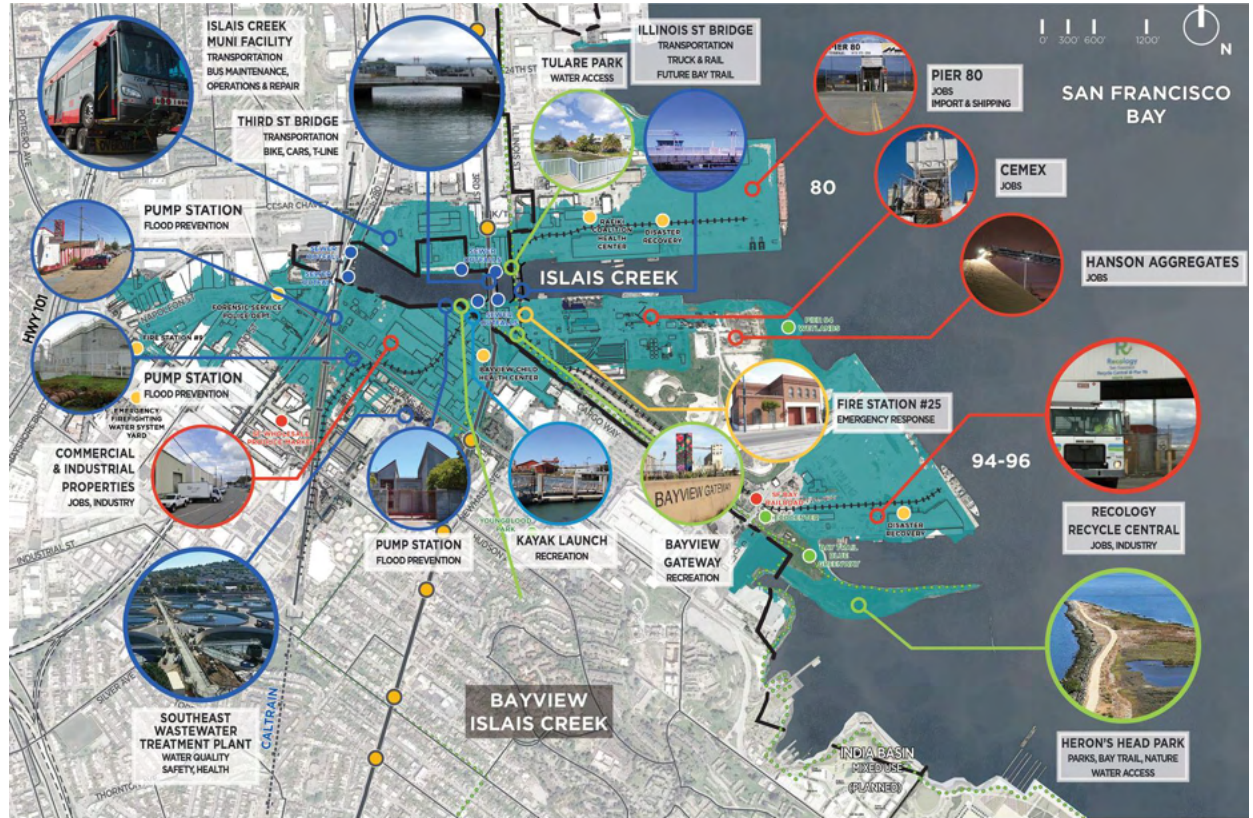


100 years flood event

USACE FLOOD RESILIENCE STUDY ASSESSMENT

Long Term/Lower Likelihood

- Areas that will flood later in the study period carry less weight in the flood damage assessment because of their low likelihood of flood risk in the near term
- These assets are still important, but the benefit to cost ratio to protect these structures on an individual basis will be lower



100 years flood event + 3' SLR

Measures and Alternatives Development

Introducing Improvements or “Measures” for Consideration Along the Waterfront

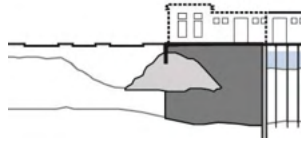


EMBARCADERO SEAWALL SEISMIC MEASURES

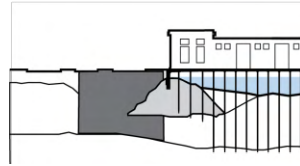
Draft Seismic Improvements Under Consideration by the Port

Seismic Measures

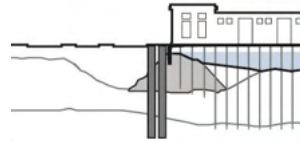
Shoreline Stabilization



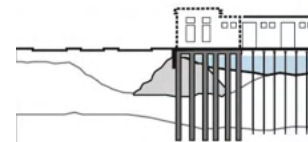
Nearshore
Buttress



Landside
Buttress

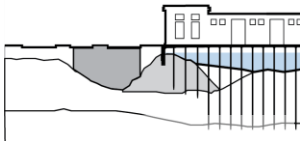


Drilled Shafts

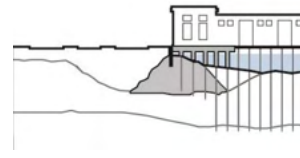


Super Bulkhead
Wharf

Targeted Measures



Liquefaction
Mitigation



Bulkhead
Wharf Retrofits

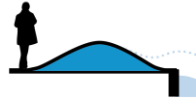
For each seismic measure:

- Preliminary Engineering
- Cost Estimates
- Construction Production Rates
- Construction Impacts
- Feasibility
- Adaptation for Sea Level Rise

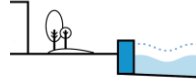
WATERFRONT-WIDE FLOOD MEASURES

Draft Flood Improvements Under Consideration by the Port

Physical



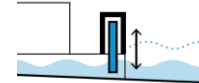
Levees



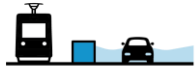
Seawalls



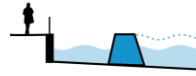
Raised Marine Structures



Tide Gates



Floodwalls



Breakwaters



Building Adaptations



Deployables

Ecological



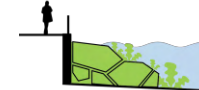
Ecological Marine Structures



Ecological Features



Aquatic Habitat



Ecological Shorelines

USACE FLOOD RESILIENCY STUDY AREA

Subareas Support Community Prioritization and Evaluation of Conditions/ Measures



SUBAREA PROFILES

Subarea Overviews

Subarea Profile
Aquatic Park
Subarea 1-1



SHORELINE TYPE:	SEISMIC RISK:
Armored & Beach: Rip rap revetment and beach backed by concrete seawall and mixed use trail.	Shoreline I Not Assessed
Subsurface Profile: NOT ASSESSED - likely non-engineered fill, interspersed sands and mud, shallow rock at Fort Mason	Liquefaction Risk: Not Assessed Shoreline Structure Vulnerability: Not Assessed Unique Conditions: Unique and vulnerable year old, beach and

SUBAREA DESCRIPTION



The Aquatic Park subarea is primarily an embankment that is fronted by marsh or varying degrees of rock protection. The primary pathway of flooding are from overtopping over broad stretches of mostly natural shoreline along the northern edge of Aquatic Park and along the India Basin Shoreline to the south of this subarea. The wetland area at Aquatic Park and the India Basin Shoreline already experience regular inundation during high tides today.

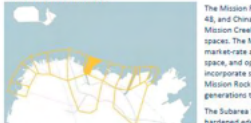
¹ Evaluation of seismic risk in this area is based on engineering judgment.
² The timing of coastal flood events that will cause significant flooding in this subarea is provided by the California Ocean Protection Council (COPC) per the 1

Subarea Profile
Mission Rock
Subarea 3-3



SHORELINE TYPE:	SEISMIC RISK:
Engineered: Filled land retained pile supported bulkhead wall and wharf. Mostly original from the early 1900s.	Shoreline Instab Not Assessed - like Liquefaction R Not Assessed - like Shoreline Struc Vulnerability: Not Assessed - poten due to age of stru
Subsurface Profile: Not Assessed - likely non-engineered fill, interspersed sands and mud, shallow rock at Fort Mason	Unique Conditions: Fill over deep bay mud, hit piers, Unique Pier 50 piers (potentially liquefiable) rock rock outcropping (Mission I

SUBAREA DESCRIPTION



The Mission Rock subarea is primarily an embankment that is fronted by marsh or varying degrees of rock protection. The primary pathway of flooding are from overtopping over broad stretches of mostly natural shoreline along the northern edge of Aquatic Park and along the India Basin Shoreline to the south of this subarea. The wetland area at Aquatic Park and the India Basin Shoreline already experience regular inundation during high tides today.

¹ Evaluation of seismic risk in areas outside of the Embarkadero Seawall Program are based on engineering judgment and will be updated after the Southern Waterfront Seismic Vulnerability Assessment is complete in Spring 2023.
² The timing of coastal flood events that will cause significant flooding in this subarea is provided by the California Ocean Protection Council (COPC) per the 1

Subarea Profile
Heron's Head
Subarea 4-5



SHORELINE TYPE:	SEISMIC RISK:	FLOOD RISK:
Beach, Armored & Marsh: Filled lands forming peninsula with protected slopes on one side and natural shoreline slope supporting tidal habitat on the other.	Shoreline Instability: Not Assessed Liquefaction Risk: Not Assessed Shoreline Structure Vulnerability: Not Assessed	Tipping Point Elevation: 38' above high tide Coastal Flood Events Timing
Subsurface Profile: Not Assessed - likely non-engineered fill originally classified as debris dike	Unique Conditions: Restored tidal wetland area, with no structures present	100-yr Flood Today High tide + 36" SLR 2068 - 2101

SUBAREA DESCRIPTION



The Heron's Head subarea primarily consists of the 21-acre Heron's Head Park, originally constructed as part of never-completed construction of a new cargo terminal, "Pier 88," and officially owned as an industrial area. It is now home to native plants and more than 100 bird species and one of the few wetlands on San Francisco's shoreline. The EcoCenter at Heron's Head Park is the first LEED Platinum - Zero Net Energy Building in San Francisco, using sustainable on-site power, and wastewater systems. The educational community center at the EcoCenter as well as the park walking paths, bird watching, and ecosystem restoration activities are part of a commitment to create a sustainable waterfront for generations to come.

¹ Evaluation of seismic risk in areas outside of the Embarkadero Seawall Program are based on engineering judgment and will be updated after the Southern Waterfront Seismic Vulnerability Assessment is complete in Spring 2023.
² The timing of coastal flood events that will cause significant flooding in this subarea is provided by the California Ocean Protection Council (COPC) per the 1

- One of the many tools created to support the development of alternatives
- All Subarea Profiles, POOCs, and Flood Risk Profiles for all 15 subareas are online
- Includes data on flood and seismic risk
- Includes community-prioritized assets

FOCUSED ARRAY THEMES

Introduction and Overview by Measure Classes



- A theme is a planning tool to spark brainstorming of alternatives
- A theme can serve as an alternative that addresses a set of specific issues and illuminate trade-offs
- Some themes work better in certain locations and not as well or at all in other locations

ALTERNATIVES DEVELOPMENT

Overview



SUBAREA MATERIAL AND MEASURES

Includes information critical to alternatives development, including Problems and Objectives, Flood and Seismic Hazards, Stakeholder Input, Applicable Measures and Unique Characteristics of a subarea.

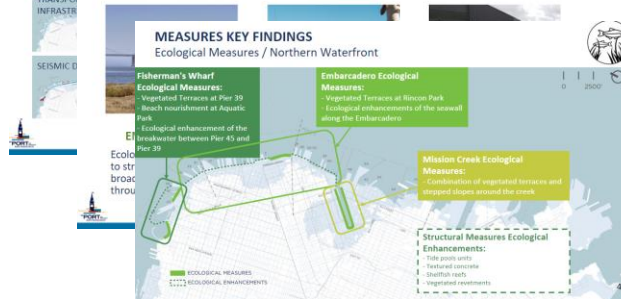
FOCUSED ARRAY THEMES

Introduction and Overview by Measure Classes

ECOLOGICAL ASSETS AND SERVICES HISTORICAL AND CULTURAL

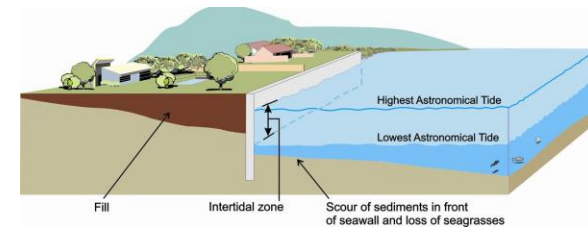
• A theme is a planning tool to

OVERALL KEY FINDINGS FROM FOCUSED ARRAY DEVELOPMENT



FOCUSED ARRAY

Flood and seismic measures used to create thematic alternatives that resulted in a wide range of approaches to reduce risk. Process provided the team with information about applicable approaches and trade-offs along the entire waterfront.

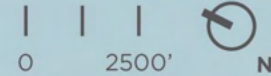


ALTERNATIVES AND ACTIONS

Based on the key findings, four concept alternatives and associated actions were identified for further development, refinement, consideration of phasing, and preliminary evaluation.

MEASURES KEY FINDINGS

Structural Measures / Southern Waterfront



Mission Bay identified measures include:

- Levee with revetment
- Raised pathway / Raised features
- Native, Vegetated Terraces

Islais Creek identified measures include:

- Tidal gates and barriers
- Raised bridges
- Raised pathways / Raised features

Piers 80/94/96 identified measures include:

- Raised features
- Raised wharves
- Ecological improvements

Pier 92 identified measures include:

- Raised pathway
- Raised features
- Earthen levees

 INLAND STRUCTURAL MEASURES
 BREAKWATERS - EVALUATION IN FUTURE DESIGN PHASES

MEASURES KEY FINDINGS

Ecological Measures / Southern Waterfront



Central Waterfront Ecological Measures:

- Combination of beaches and vegetated revetments bayward at Bayfront Park and Pier 70

Piers 80/94/96 Ecological Measures:

- Combination of stepped slopes and vegetated revetments softening the edges at Warm Water Cove, Pier 94 wetlands and Heron's Head.
- Ecological enhancements of Pier 80/94/96

Structural Measures

Ecological Enhancements:

- Tide pools units
- Textured concrete
- Shellfish reefs
- Vegetated revetments

Islais Creek Ecological Measures:

- Stepped slopes reshaping the geography of Islais Creek





Stakeholder Engagement

A Community-Driven Process



WRP COMMUNITY AND STAKEHOLDER ENGAGEMENT

Community / Advisory Group Engagement



COMMUNITY GROUPS

Coordinated over 115+ community and stakeholder group presentations



WATERFRONT-WIDE

Presentations to groups along the entire waterfront, including Embarcadero and Islais Creek / Bayview



ADVISORY GROUPS

The Port continues to collaborate with Port advisory groups, including regular presentations and opportunities for input

WRP COMMUNITY AND STAKEHOLDER ENGAGEMENT

Community Event Outreach



STREET TEAM OUTREACH

Grassroots outreach at 100+ local events continues to be an integral part of introducing residents to the Seawall



KEY PARTNERSHIPS

Highlights include partnerships with Rec & Park Cal Academy, WorldWideWomen Girls' Festival, and more



HOSTED EVENTS

The Port has hosted a series of free “mixers” and pop-up events in the Bayview, along with a free waterfront-wide boat tour

FEEDBACK FROM “ASSET MAPPING” EXERCISE

Islais Creek / Bayview Feedback



- Bayview Opera House
- Candlestick Point
- Neighborhoods
- Parks and Open Space
- Heron’s Head
- Water Access
- Families and Communities
- Schools
- Community Based Organizations



- Housing
- Wastewater/ Sewage
- Third Street Bridge
- Transportation and Utilities
- Critical Facilities
- Jobs and Workforce Development
- Commercial Corridors and Local Industry



- Emergency Response
- Transportation
- Hospital Access
- Neighborhood Function
- Water Quality
- Contaminated lands
- Bayview/Hunters Point

FEEDBACK ON GEOGRAPHIC PROGRAM GOALS

Islais Creek / Bayview Feedback

PARTICIPANT'S HANDOUT
TABLE NUMBER:

SOUTHERN WATERFRONT DRAFT GOALS

WELCOME!
Islais Creek Adaptation Strategy
Waterfront Resilience Program,
Southern Waterfront
Workshop #2, Thursday January 30th
16 Community Hall

OVERALL PROJECT GOAL:
A VISION FOR ISLAIS CREEK THAT ADAPTS TO FLOOD RISKS WHILE ENSURING HEALTHY AND RESILIENT COMMUNITIES

COMMUNITY & SOCIAL EQUITY

- Encourage neighborhood vitality, character, and diversity with more mixed-income housing
- Adapt buildings, open spaces and services that ensure the safety and preparedness of the district and city in the case of a flood emergency
- Develop equitable solutions with and for a wide variety of community members, including youth, seniors, families and people of color

EXPERIENCE

AUTHENTIC AND TRANSPARENT PUBLIC ENGAGEMENT DURING AND BEYOND THE PLANNING PHASE

- Build a long-lasting basis of support with a transparent, authentic engagement process
- Engage with youth to build long-term understanding, capacity, and ownership
- Acknowledge the significance of the nearby designated African American Cultural District of Bayview Hunters Point, and other cultural groups, as central to developing future visions
- Engage with youth to build long-term understanding, capacity, and ownership

TRANSPORTATION

A TRANSPORTATION SYSTEM THAT IS RESILIENT AND ADAPTABLE TO FLOOD RISK

- Adapt key transportation facilities to flooding to maintain operations, service and connectivity
- Improve connectivity between Bayview and other neighborhoods
- Improve pedestrian and bike connections to provide resilience during near term periods, flood events
- Create accessible transportation between the waterfront, the City and the region

ENVIRONMENT

A HEALTHY ENVIRONMENT FOR RESIDENTS, WORKERS, AND ECOLOGIES

- Identify solutions and strategies that benefit the entire Islais Creek watershed
- Prioritize nature-based solutions and green infrastructure to mitigate floods, improve stormwater management and support local ecology
- Improve access to and create new resilient open spaces along the creek and low-lying areas to provide much needed recreational space for the surrounding neighborhoods

ECONOMY

A SUSTAINABLE ECONOMY THAT BENEFITS LOCAL RESIDENTS, WORKERS, AND INDUSTRIES

- Adapt flood-prone areas that currently support existing jobs, small businesses and local artists
- Support local, blue collar industrial jobs
- Use the planning process of this project as an opportunity to train and mentor individuals in the fields of design, planning and engineering
- Retain and increase of women- and minority-owned businesses, community benefit organizations, worship centers, and arts and culture organizations



STRENGTHEN
1 FT OF SEA LEVEL RISE NOW - 2050

ADAPT
2 FT OF SEA LEVEL RISE 2050 - 2100

ENVISION
3 FT OF SEA LEVEL RISE 2100 - 2140

**WHICH OBJECTIVES DO WE PRIORITIZE IN EACH PHASE?
HOW DO WE BALANCE ALL THE GOALS OVER TIME?**

TABLE NUMBER:

- Prioritize homes, including low-income housing
- Prioritize environmental concerns and ensure anti-displacement is centered in any work
- Broad support for the Embarcadero Seawall Program as addressing risk is important to the entire City, including the Bayview
- That said, prioritize resilience projects in the southern waterfront
- Continue engagement with the communities in the southeast to ensuring equitable and sustainable outcomes along the Port's entire 7.5 mile jurisdiction

HOW THIS ENGAGEMENT EFFORT INFORMED THE WRP

Community Input Helped Refine WRP

1

Community feedback affirmed focus on **life safety & emergency response** and offered ideas for evolving how we understand “inspiring an adaptable waterfront”:

- Connecting
- Accessible
- Supporting jobs, housing, seniors & youth

2

Community feedback affirmed the Port goals and encouraged:

- Transparency
- Accountability
- Engagement
- **Prioritize assets most loved by the community and most important to the city**
- Select projects that responsibly use tax dollars

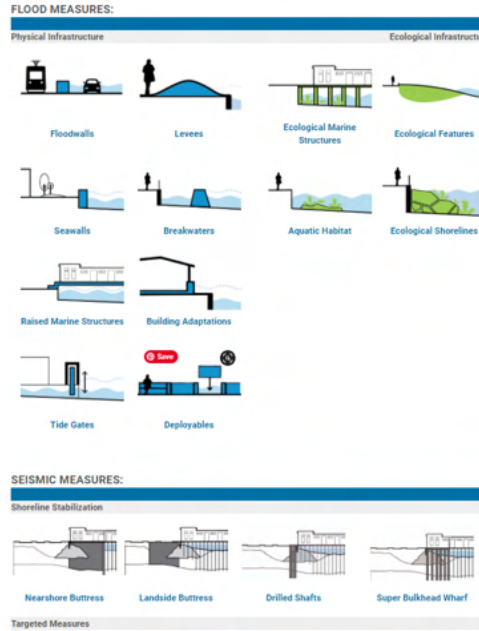
3

Community feedback on evaluation criteria affirmed the Port’s key focus on life safety and disaster response

- **“Put people first”**
- Assets and services most prioritized: housing, disaster recovery facilities, utilities, and businesses
- Key focus on transportation assets

DIGITAL ENGAGEMENT HIGHLIGHTS

Feedback via Waterfront Resilience Story Maps and a Measures Explorer



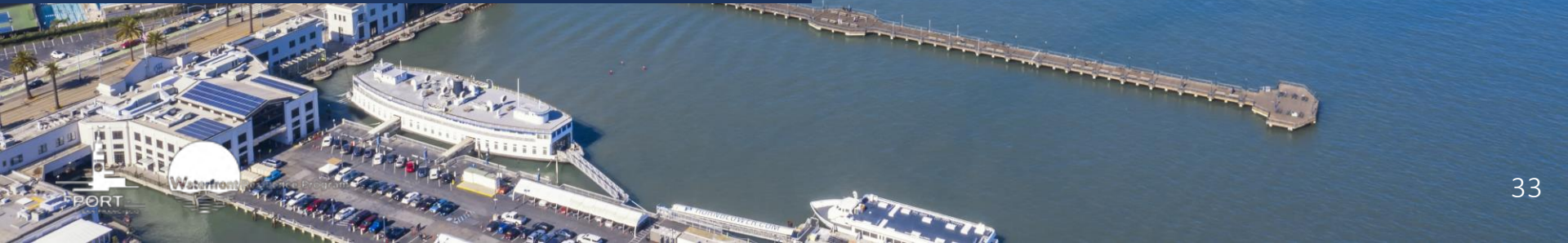
- To date, there have been more than **100K page visits** across all Measure Explorer and Story Maps pages
- The top three measures with the most page views: **Levees, Floodwalls, Seawalls**
- The top three themes with the most page views: **Open Space, Transportation, Maritime**

<https://www.sfportresilience.com/planning-for-our-future>

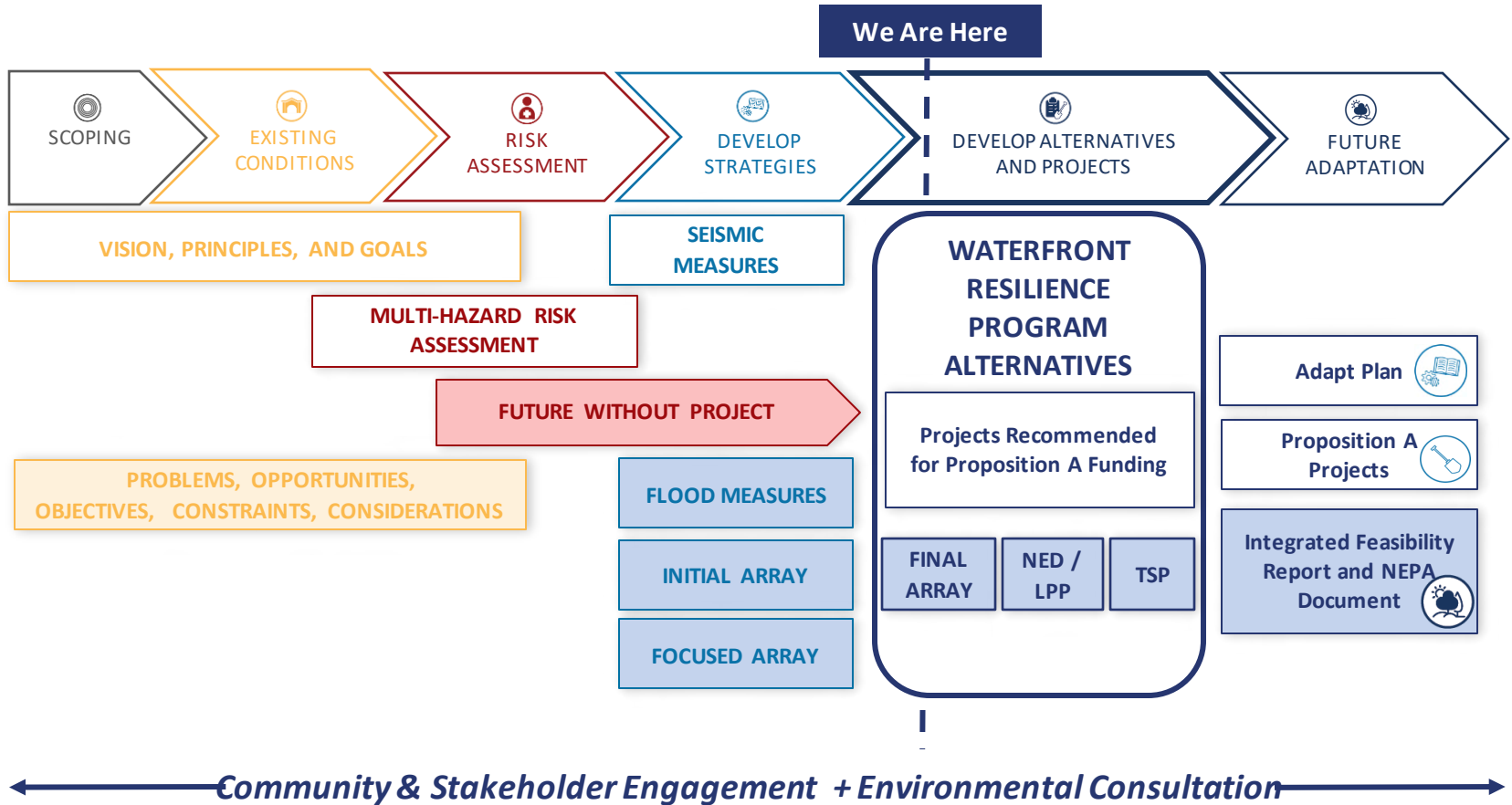


Next Steps

What's Next for the Waterfront Resilience Program?



ALTERNATIVES DEVELOPMENT PROCESS



UPCOMING COMMUNITY ENGAGEMENT

Engagement planned before the end of 2020 and early 2021



- Meetings co-hosted with community-based organizations in Islais Creek / Bayview and Mission Creek / Mission Bay
- Ongoing digital engagement, including feedback on waterfront-wide measures and Waterfront Resilience Story Maps
- Ongoing tenant engagement
- Youth engagement with youth-serving organizations that serve citywide youth

A photograph of two children riding bicycles away from the camera on a dirt path. The child in the foreground is wearing a red and white jersey and a yellow helmet. The child in the background is wearing a dark jersey with 'CROLEY 30' on the back and a dark helmet. In the background, a large ship is docked at a pier, and there are some trees and a clear blue sky.

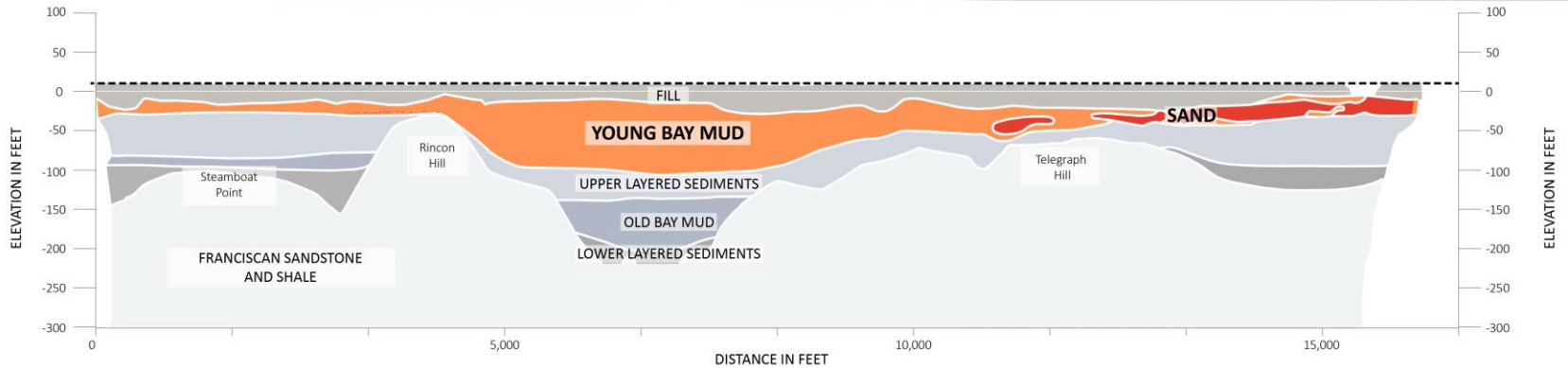
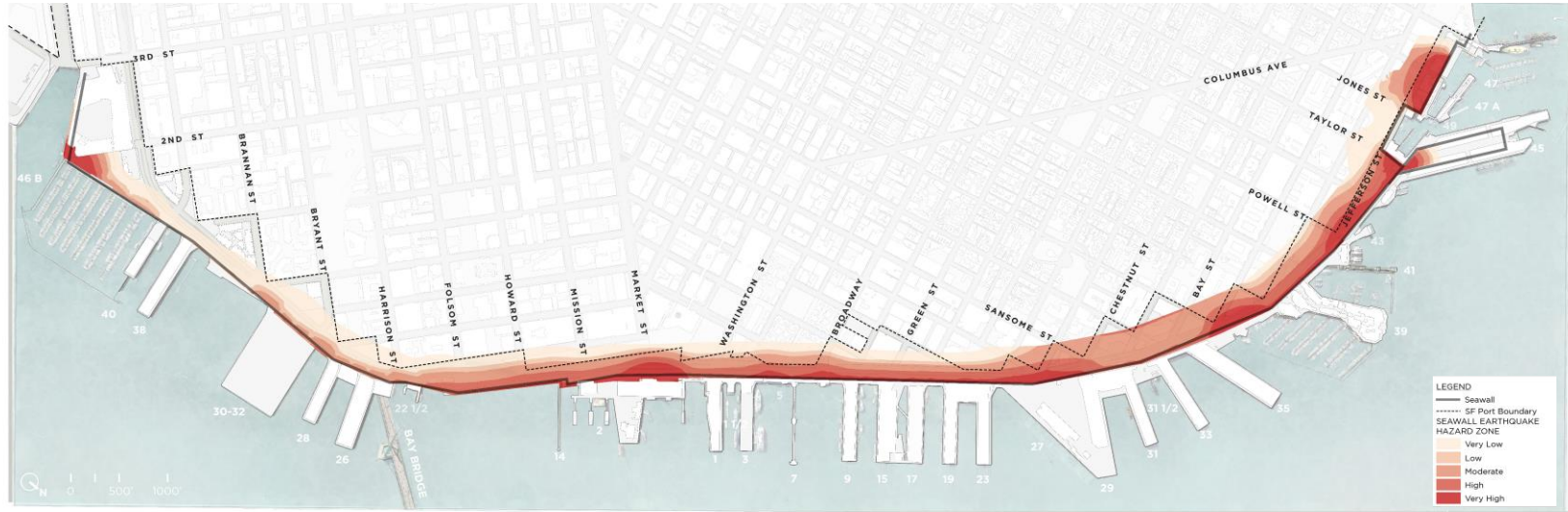
Thank You!

Lindy Lowe, Port of San Francisco
lindy.lowe@sfport.com

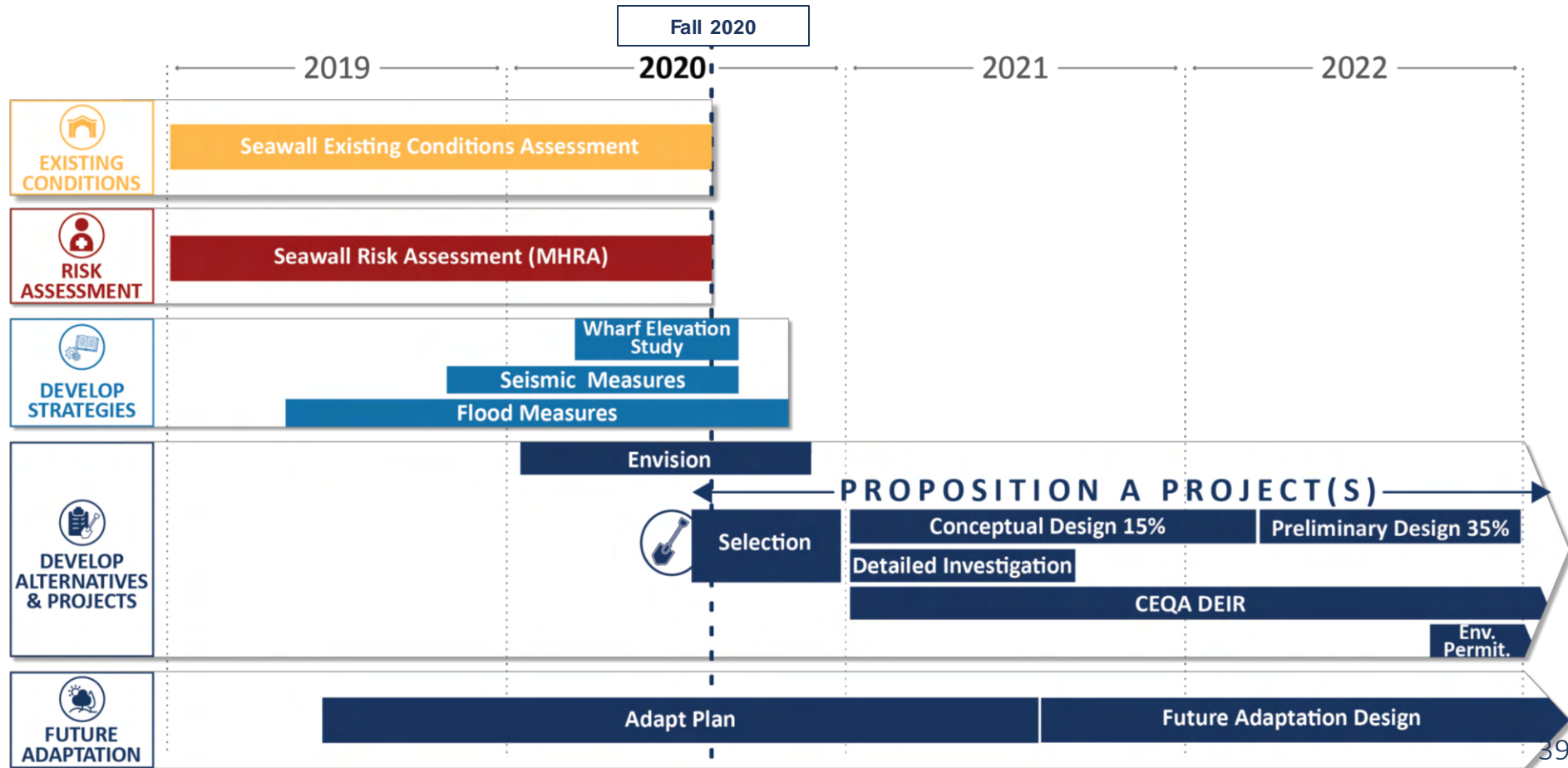


UNUSED SLIDES...

SEAWALL EARTHQUAKE HAZARD ZONE



EMBARCADERO SEAWALL PROGRAM SCHEDULE



EXISTING SHORELINE

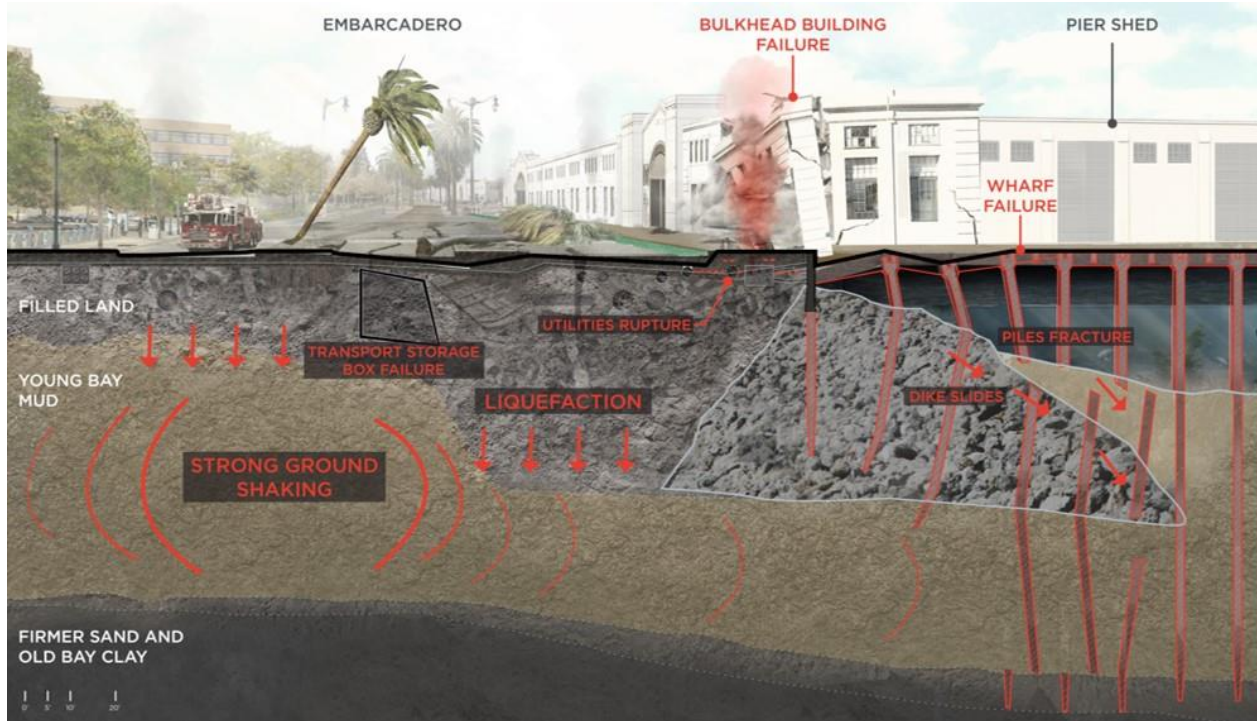
Critical Components of the Waterfront



- Seawall and Bulkhead Wharves are the city's flood protection and are highly vulnerable to seismic events

BULKHEAD WHARF EARTHQUAKE HAZARDS

MHRA Key Findings



Liquefaction induced lateral spreading at Port de Port-au-Prince



Lateral spreading cause by 1906 earthquake in San Francisco

BULKHEAD WHARF

WHARF TODAY AT CURRENT WATER LEVEL



WHARF TODAY WITH WATER LEVEL SURGE



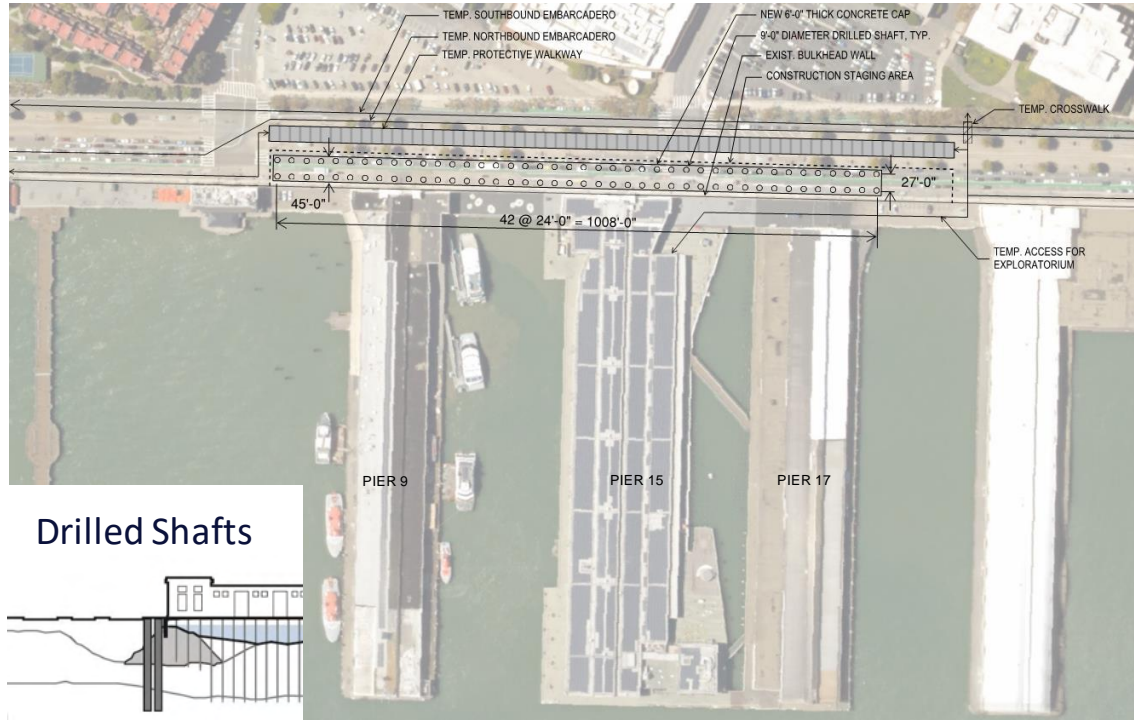
Wharf is a current protection measure
– King Tide conditions today

LOCATIONS OF INTEREST



SEAWALL SEISMIC MEASURES DEVELOPMENT

Example Measure Construction Process

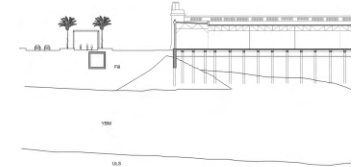


Drilled Shafts

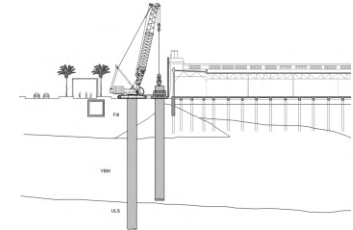


Construction Stages

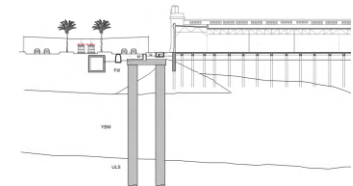
Remove / relocate utilities:



Close northbound lanes, reroute traffic, install concrete shafts:



Place slab, restore Embarcadero:

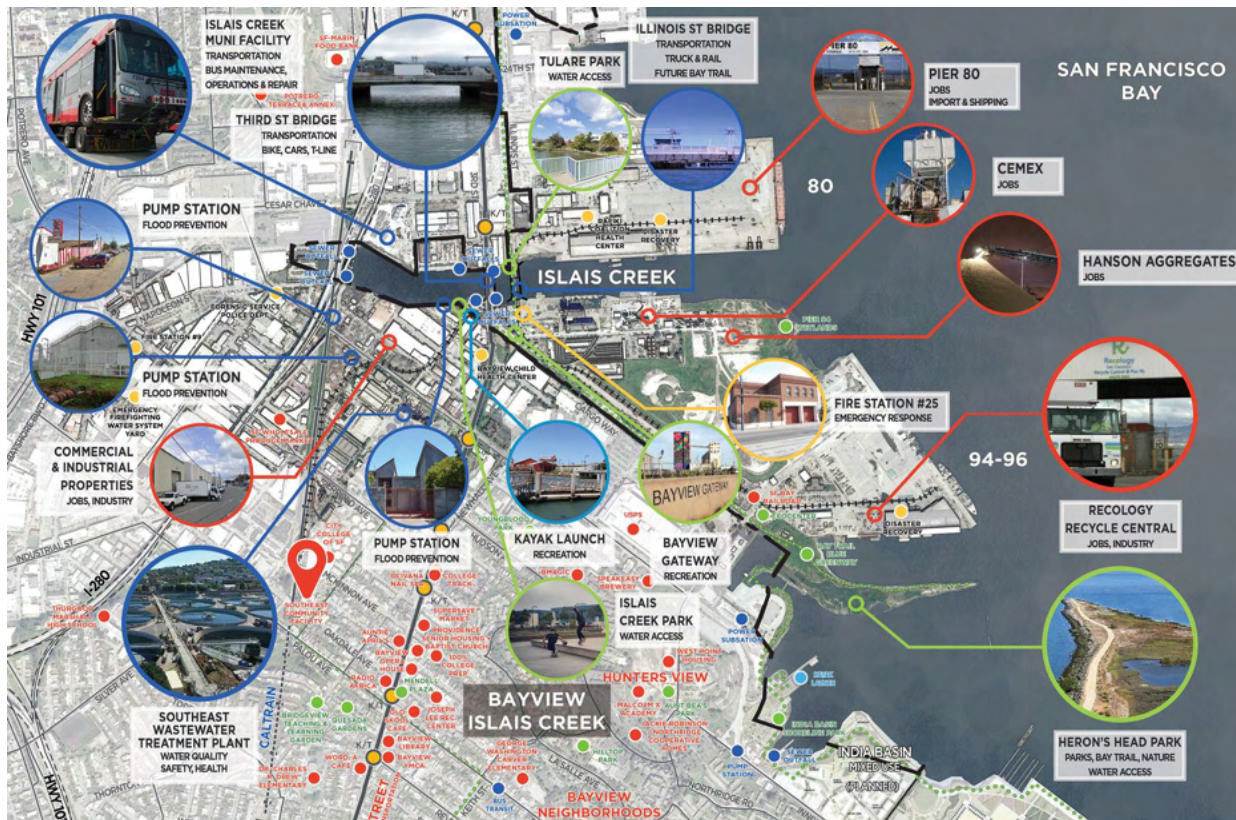


COMPILE ROBUST INVENTORY OF ASSETS

FWOP – Step 1

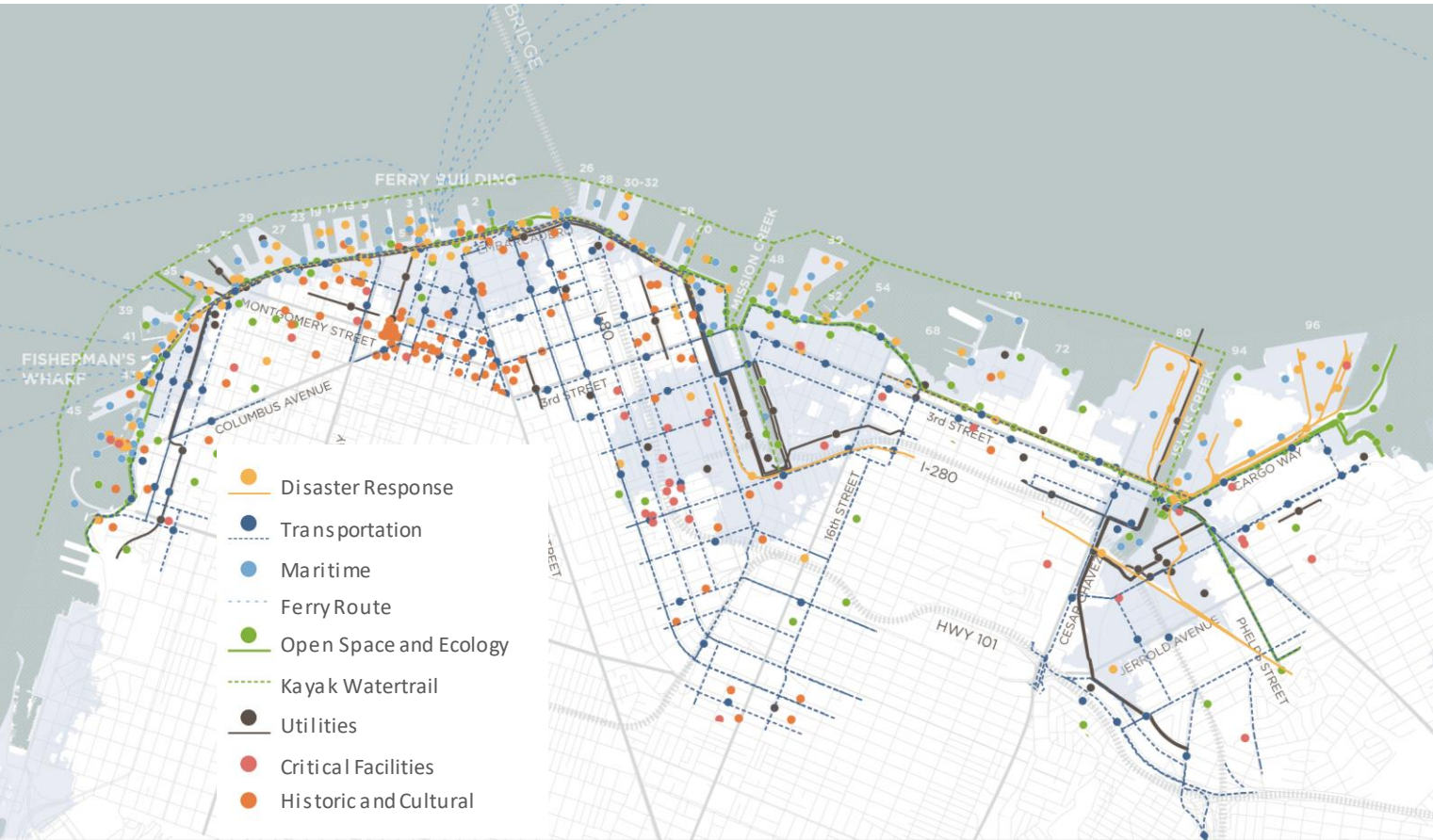
Collaborated with City partners, Port tenants and other stakeholders to:

- Assign value to physical infrastructure
- Estimate impact of disruption and downtime for businesses and services
- Evaluate vulnerability of each asset to flood risk based on water depth
- Compile exhaustive database of all assets within the flood plain for use in the planning model



COMPILE ROBUST INVENTORY OF ASSETS

FWOP – Step 1

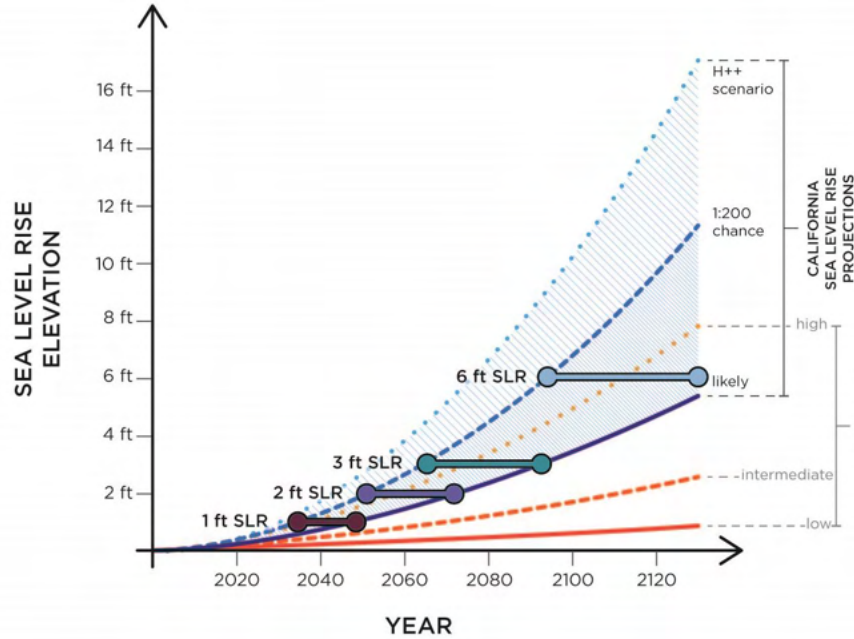


Assets at risk include more than:

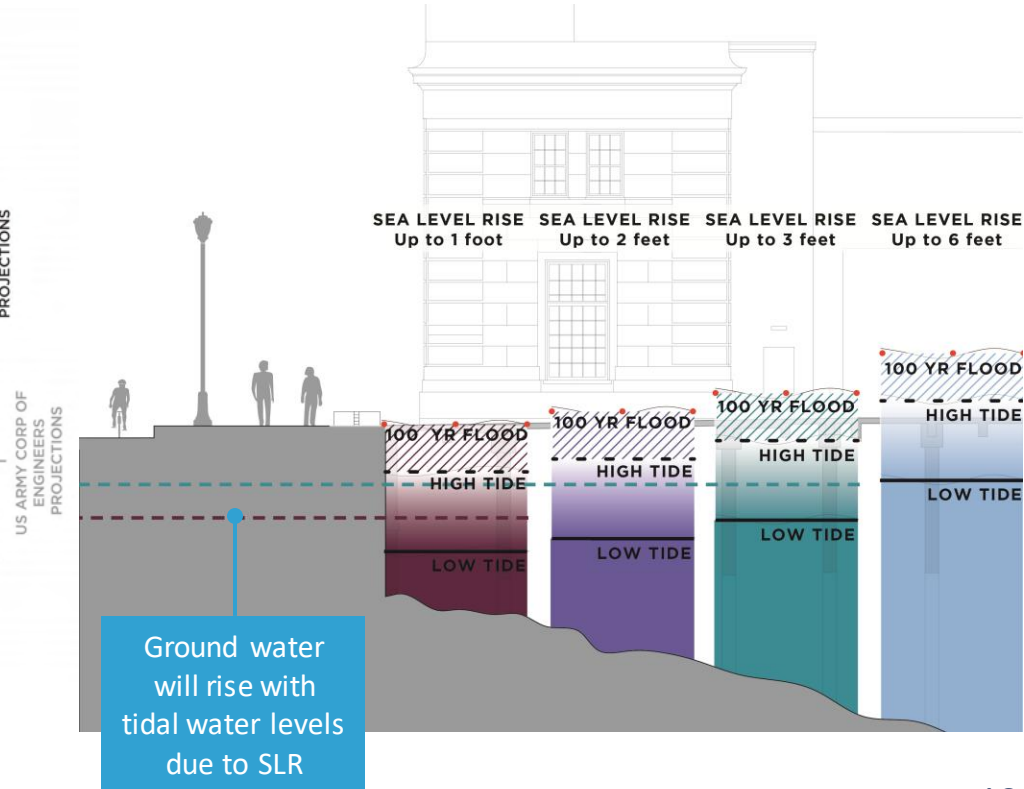
- 40 miles of roadway
- 25 miles of muni & cable car track
- 5 miles of freight railway
- 6 fire stations
- Dozens of other critical facilities
- 11,000 jobs
- 360,000 regional commuters
- 2,600 residential and commercial buildings
- 13,500 residents, 58% people of color
- Wastewater functions for 580,000 residents

DETERMINE FLOOD SCENARIOS

FWOP – Step 2

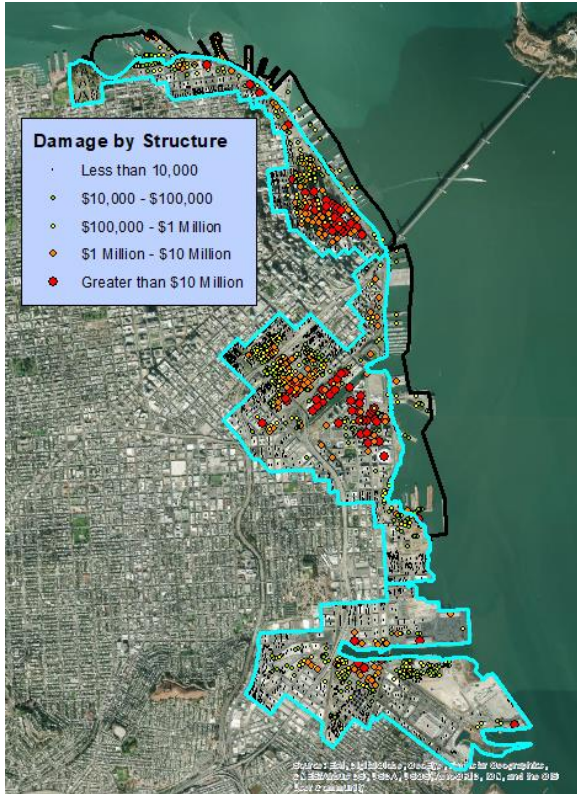


State of CA – Updated 2018; USACE – Updated 2013



PLANNING MODEL TO ANALYZE FWOP DAMAGES

FWOP – Step 3



Coastal Flood Scenarios



Robust Asset Inventory



Planning Model
(Economic Damages)

*DRAFT – work in progress

FUTURE WITHOUT PROJECT (FWOP)

Summary

1

The Future Without Project (FWOP) scenario effectively defines the size and scope of a potential federal investment in flood risk reduction for the San Francisco waterfront

2

Due to the complexity of the San Francisco Waterfront and challenges with USACE technical tools, this milestone is delayed

3

The Port and USACE have been working together to identify to accurately define the potential federal investment, consistent with USACE rules, policies, and guidelines

4

The study is at the nexus of several issues that are new to USACE:

- Use of the computerized life-cycle planning model (G2CRM)
- Application of future tidal flood damages which equate to frequent disruption of city function
- Integration of RED/OSE into decision making – updated USACE policy in development

FUTURE WITHOUT PROJECT (FWOP) CONDITION

Purpose

1

Flood events will cause damages and impacts felt throughout the city, region and beyond as sea level rises

2

The Flood Resiliency Study will quantify damages and impacts to determine the level of "Federal Interest"

3

Future Without Project (FWOP) is which all Federal actions are measured

4

Account for all projects taken by the Port or City in advance of a Federal project which will impact flood risk (i.e. Mission Rock, Pier 70, Potrero Point)

5

There is a high likelihood of Federal investment to prevent future damages when the cost of mitigation actions are less than the potential damage

STAKEHOLDER ENGAGEMENT HIGHLIGHTS

Ongoing engagement with City departments, local and regional agencies, resource agencies, and more

Problems, Opportunities, Objectives, Constraints, and Considerations
Fisherman's Wharf
 Subarea 1-2



Subarea Description
 Fisherman's Wharf (Subarea 1-2) includes Fisherman's Wharf, an active fishing industry and popular tourist area with features:

Problems, Opportunities, Objectives, Constraints, and Considerations
Ferry Building
 Subarea 2-2



Subarea Description
 Ferry Building (Subarea 2-2) includes the iconic Ferry Building, a landmark building, the city's downtown ferry terminals, and portions of San Francisco's Financial District. It is an active neighborhood and the heart of the city.

Problems, Opportunities, Objectives, Constraints, and Considerations
Islais Creek
 Subarea 4-2



Subarea Description
 Islais Creek (Subarea 4-2) covers a large portion of the neighborhood surrounding Islais Creek. It includes the existing levee surrounding the western portion of Islais Creek, Islais Creek Channel, and the northern section of the Bayview-Hunter Point neighborhood north of Palms Avenue.

Problems, Opportunities, Objectives, Constraints, and Considerations
San Francisco Bay
 Subarea 5-2




Subarea Description
 San Francisco Bay (Subarea 5-2) includes the city's waterfront, the city's downtown ferry terminals, and portions of San Francisco's Financial District. It is an active neighborhood and the heart of the city.

Measure Profile
New Seawall Bayward
 Flood Adaptation Measure



PHYSICAL INFRASTRUCTURE
 SHORELINE LOCATION
 DESIGN LIFE: 100+ years
 COASTAL FLOOD HAZARD: Sea Level Rise
 MEASURES COMPATIBLE: Flood

Measure Profile
Locks
 Flood Adaptation Measure



PHYSICAL INFRASTRUCTURE
 SHORELINE LOCATION
 DESIGN LIFE: 100+ years
 COASTAL FLOOD HAZARD: Sea Level Rise
 MEASURES COMPATIBLE: Flood

Measure Profile
Earthen Levee
 Flood Adaptation Measure



PHYSICAL INFRASTRUCTURE
 SHORELINE LOCATION
 DESIGN LIFE: 100+ years
 COASTAL FLOOD HAZARD: Sea Level Rise
 MEASURES COMPATIBLE: Flood

Measure Profile
Bayward
 Flood Adaptation Measure



PHYSICAL INFRASTRUCTURE
 SHORELINE LOCATION
 DESIGN LIFE: 100+ years
 COASTAL FLOOD HAZARD: Sea Level Rise
 MEASURES COMPATIBLE: Flood

- The **Interagency Coordinating Team**, which is convened jointly by USACE and Port staff, enables each agency to partner in the Study
- A **Cooperation and Participating Resource Agency Working Group (RAWG)** was established consisting of representatives from the USACE, the Port, and the various State and Federal agencies concerned with the study area

COMMUNITY & STAKEHOLDER ENGAGEMENT OVERVIEW

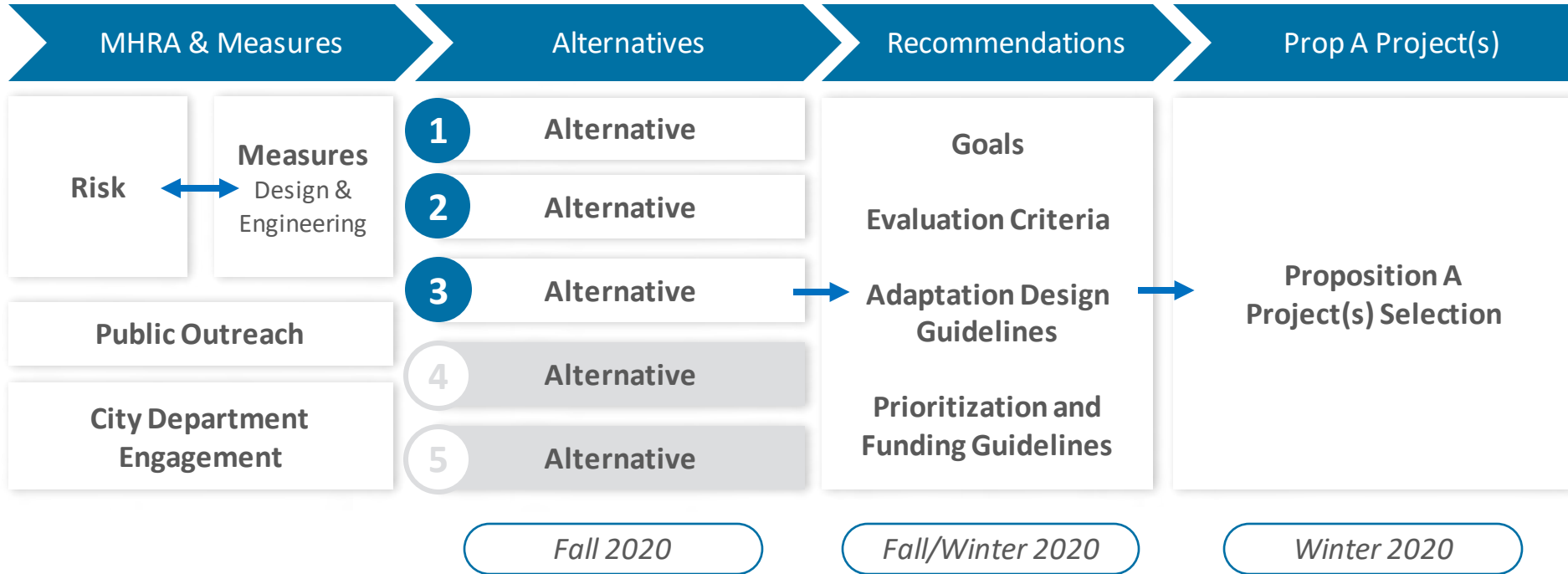
Ongoing Engagement

The Port is proud to work with a diverse group of LBE, WBE, and MBE subcontractors to plan and execute engagement, which has included:

- Connected with thousands of San Francisco residents at City wide neighborhood events
- Community meeting series in three waterfront geographies
- Casual "mixers" to engage key stakeholders and interested public
- Digital engagement
- Youth engagement
- Public housing engagement
- Over 100 presentations to neighborhood, business, community, and CAC groups along the waterfront and citywide
- Targeted Port tenant engagement
- Press

ALTERNATIVES DEVELOPMENT

Embarcadero Seawall Program Proposition A Project Selection



PROBLEMS, OPPORTUNITIES, OBJECTIVES, CONSTRAINTS AND CONSIDERATIONS

Subarea Scale "POOCCs"

Problems, Opportunities, Objectives, Constraints, and Considerations
Fisherman's Wharf
Subarea 1-2

Subarea Description



Subarea 1-2: Fisherman's Wharf

area for the sea lions and the Aquarium of the Bay. Pier 39 and the Blue & Gold Fleet, which provides sightseeing boat to end a water taxi dock. Many restaurants, stores, and additional California's top visitor-serving destinations. Additional facilities: Outcroppings, Pier 39 Garage (Seawall Lot 311), the Port harbor a variety of commercial stores, fish processing, and industrial Pier 45 docks historic vessels, including the Jeremiah O'Brien remains a key maritime asset with modern fish processing ops with active berths along Dredg B and C. Shed C and the drop in a 4-alarm fire on May 23, 2020. Pier 45 is also home to the Pier 49, located near the base of Pier 45, includes the Fishermans restaurants, including The Droitto, Alidor's, and Terantino's at Street Pier and Pier 45 is home to Somer's restaurant, and a White Fleet terminal and Francisco Crab Restaurant at Pier 4 include a ferry terminal for the San Francisco Bay Ferry, which Many of the tourist destinations, shoreline access areas, and a San Francisco Bay Trail, a regional trail system that is designed estuary through all nine counties. There is also a Bay Area War II Launch Accessible Transfer System that connects to woods in and out of the water. The system also includes launch roller to lift, slide over, or drop down into a kayak or canoe, as well as Area Water Trail boat launch are storage racks with room to 2 short-term use to explore Pier 39.

Problems, Opportunities, Objectives, Constraints, and Considerations
Ferry Building
Subarea 2-2

Subarea Description



Subarea 2-2: Ferry Building

to loss of jobs, tourism, and revenues, causing significant economic and those who cannot work remotely would be most impacted. This is due to COVID-19.

The subarea's one-mile shoreline is entirely engineered and includes Embarcadero Sewell and historic piers.

Landmarks of this subarea include the Central Embarcadero Historic National Register. In 2016, it was named one of America's 11 most on Historic Preservation. This annual list identifies the nation's architects, irreplaceable damage. Loss or damage of the Ferry Building, the adjacent impact the area's historic district, affecting tourism and potentially in Pier 1 that was rehabilitated and serves as the Port of San Francisco head a BaySide History interpretive walk through the bulkhead building and be used for public functions. The bulkheads of Piers 1, 3, 5, 7, and 9 have BaySide History interpretive walk, and office space. Pier 3 is an open-public access. The Pier 24 Annex houses the Pier 24 Photography art 1 Across from the Ferry Building, Embarcadero Plaza, with its Valenciano between the City and the Bay. It connects the Embarcadero and Marin

Problems, Opportunities, Objectives, Constraints, and Considerations
Islais Creek
Subarea 4-2

Subarea Description



Subarea 4-2: Islais Creek

365 days a year, and serves about two-thirds of San Francisco residents, or over 500,000 people as of 2016. Neighborhoods served by the plant include the Marina, Financial District, South of Market Area, Mission, Hunters Point, and Visitacion Valley.

More than 80 percent of the total annual wastewater flow from the city is processed by the Southeast Treatment Plant. Wastewater and stormwater are transported through a network of transport and storage facilities, sewers, and high-capacity pump stations prior to reaching the Southeast Treatment Plant. Treated wastewater and stormwater is discharged to the Bay through an offshore outfall near Pier 80.

Disaster response assets, such as fire stations and hydrants of the Emergency Firefighting Water System (EFWS), also known as the Auxiliary Water Supply System or AWWSS, are in the subarea. The EFWS is supplied by the local potable water system and saltwater from San Francisco Bay and distributed via a separate pipe network from the potable water systems.

The subarea contains the northern portion of the 3rd Street neighborhood commercial district. Third Street, including the Muni T-Third Light Rail Line (Muni T-Line), is a critical north-south transportation route for Bayview residents. Third Street and the Muni T-Line cross Islais Creek along the Third Street Bridge. The Illinois Street Bridge primary serves to provide railroad and heavy truck access to Piers 90-96, while also relieving congestion on Third Street. Illinois Street Bridge and the Illinois Street Bridge are also part of the City's disaster response system.

Within the Islais Creek inlet, the shoreline is primarily engineered, but small strips of natural shoreline are located between the inlet and the inland developed areas. Some of these areas are designated as parks with public shoreline and trail access. The City received funding from Caltrans to develop strategies to address sea level rise and coastal flooding adjacent to Islais Creek through the Islais Creek Adaptation Strategy. The project will develop near-term resilience measures, mid-term adaptation, and a long-range vision for the Islais Creek shoreline that protects transportation infrastructure, enhances shoreline access and habitat, and increases community resilience in adjoining neighborhoods. Islais Creek is also included in the Port and U.S. Army Corps of Engineers Flood Study, which is analyzing flood risks along San Francisco's bay-side shoreline.

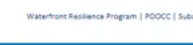
The Islais Creek channel is also part of the Port of San Francisco Piers 80-96 Maritime Eco-Industrial Strategy (Maritime Eco-Industrial Center), which is generally bounded by 25th Street on the north, Illinois Street on the west and Cargo Way on the south. The Port defines the Maritime Eco-Industrial Center as an area that co-locates maritime industrial uses to enable

- Longer, more detailed document required by USACE effort to inform subarea scale alternatives development
- Informed by City department engagement, community meetings, events and advisory group discussions, City and Port plans and policies and direct review and input from Port staff



Waterfront Resilience Program | POOCC | Subarea 1-2 Fisherman's Wharf | Page 1 of 7

² The San Francisco Bay Trail. Available at <http://baytrail.org/>



Waterfront Resilience Program | POOCC | Subarea 4-2 Islais Creek | Page 1 of 7

Waterfront Resilience Program Update

Bayview Citizens Advisory Committee

January 6, 2021



Waterfront Resilience Program





Waterfront Resilience Program

Overview

WATERFRONT RESILIENCE PROGRAM

Goal 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.



WATERFRONT RESILIENCE PROGRAM DRAFT PRINCIPLES

Affirmed through Robust Community Engagement

- **Prioritize** life safety and emergency response
- **Advance** equity throughout the Waterfront Resilience Program, including through community and stakeholder engagement, planning, contracting, jobs and decision making
- **Enhance** and sustain economic and ecological opportunities



WATERFRONT RESILIENCE PROGRAM DRAFT PRINCIPLES CONT.

Affirmed through Robust Community Engagement

- **Inspire** an adaptable waterfront that:
 - Improves the health of the Bay
 - Ensures public access to the waterfront and historic places and an inviting waterfront for all
 - Protects and preserves historic and maritime resources
 - Provides opportunities for diverse families, businesses, and neighborhoods to thrive
- **Lead** a transparent, innovative, collaborative, and adaptive Resilience Program



WATERFRONT RESILIENCE PROGRAM EFFORTS

Program and City Resilience Projects and Efforts



INTER-AGENCY CLIMATE RESILIENCE EFFORTS



**SLR
Vulnerability &
Consequences
Assessment**



**Ocean Beach
Adaptation**



**Hazard &
Climate
Resilience
Plan**



**Climate
Action
Strategy**



**Waterfront
Resilience
Program (Flood
Study
& Seawall)**



**Strengthen
Adapt
Envision**



**Waterfront
Plan
Update**



**Islais Creek
Adaptation
Strategy**



**CR
General Plan
Updates**

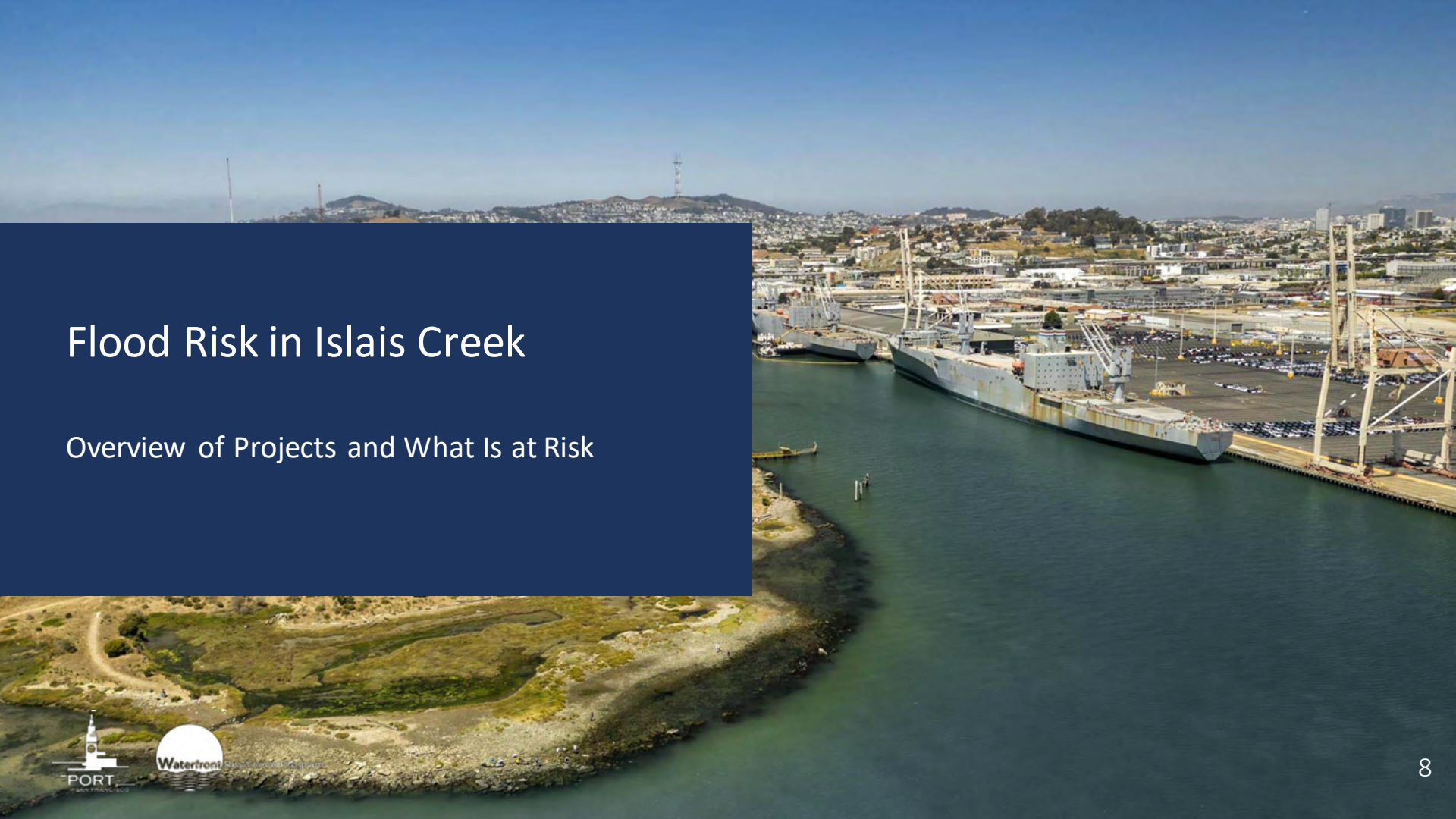


**Bayview
Resilience
Strategy**



Flood Risk in Islais Creek

Overview of Projects and What Is at Risk



U.S. ARMY CORPS OF ENGINEERS (USACE) FLOOD RESILIENCY STUDY

Overview and Key Highlights



- Port is local sponsor of 5- to 6-year study
- Flood risk assessment to identify near- mid- and long-term strategies to address shoreline and creek flooding and sea level rise
- Robust community and stakeholder input
- If the Federal government partners with the Port on a project, they will contribute 65% of its cost

ISLAIS CREEK ADAPTATION STRATEGY

Overview and Key Highlights



- Led by SF Planning in partnership with Port, SFMTA, SFPUC
- Two-year community planning process
- Develop a long-range vision for the Islais Creek shoreline and identify near- and mid-term strategies to address sea level rise

ISLAIS CREEK VISION & GOALS

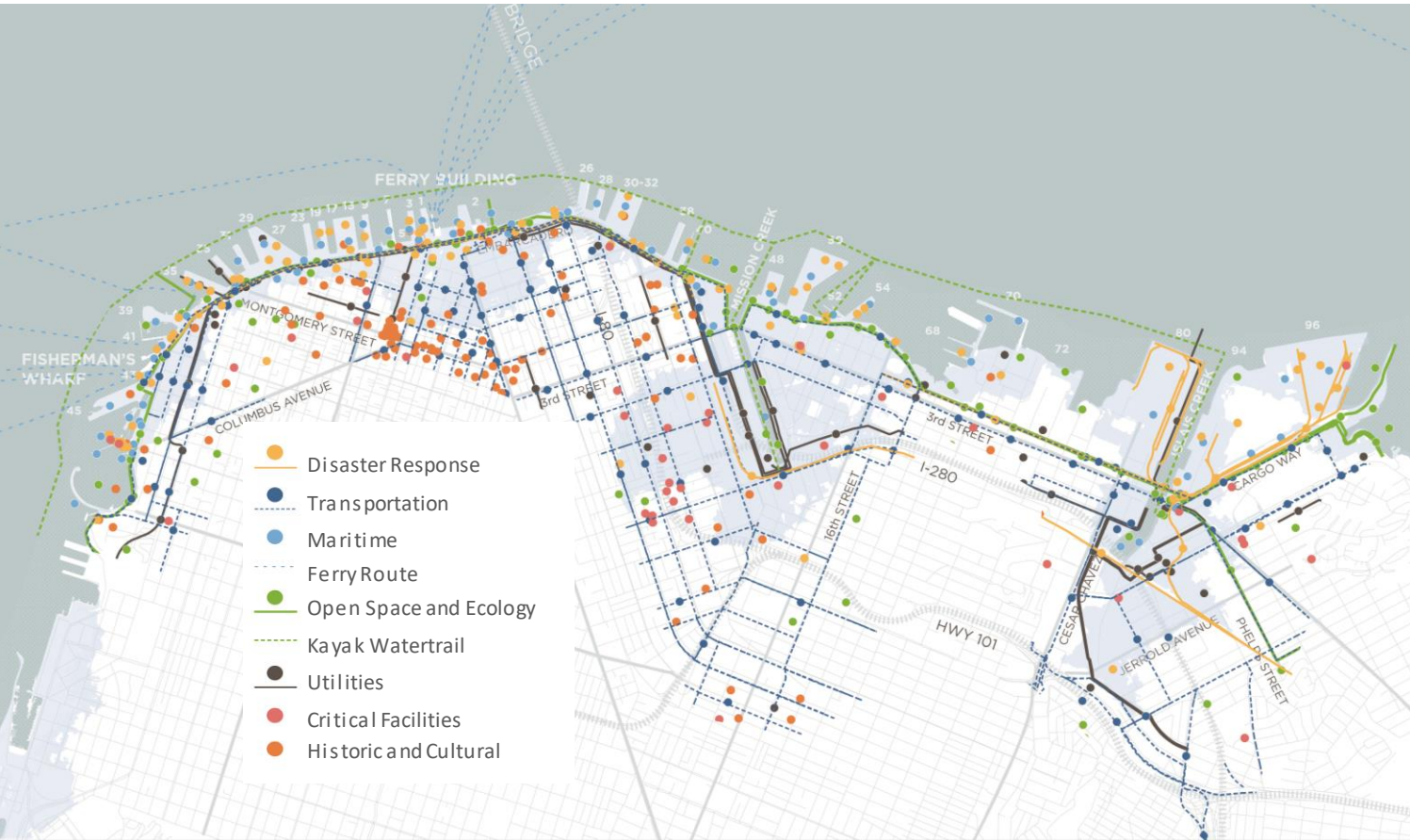


Islais Creek adapts to flood risks while ensuring healthy and resilient communities.

1. A socially & environmentally resilient neighborhood
2. Authentic & transparent public engagement during & beyond Planning
3. A transportation system that is resilient & adaptable to flood risk
4. A Healthy environment for residents, workers & ecologies
5. A sustainable economy that benefits local residents, workers & industries

Study Wide Assets at Risk

U.S. Army Corps of Engineers Flood Resilience Study



At Risk:

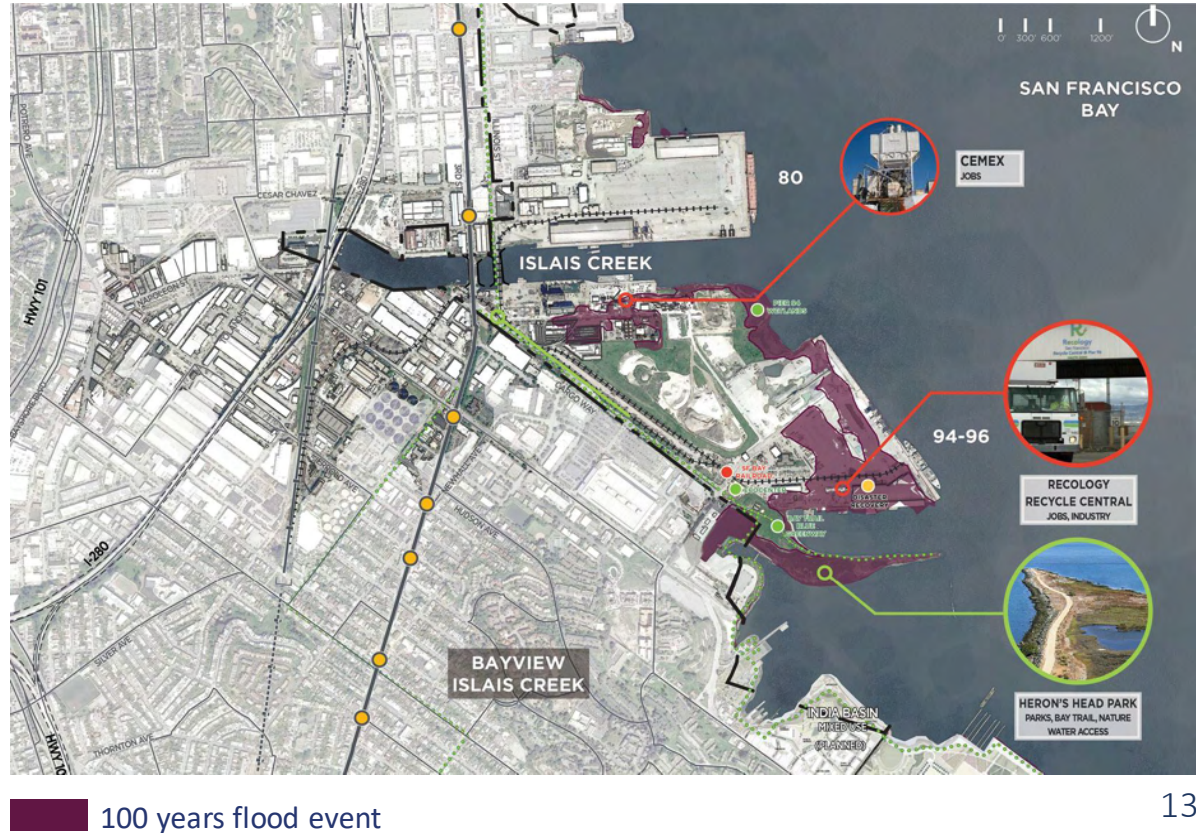
- 40 miles of roadway
- 25 miles of muni & cable car track
- 11,000 jobs
- 13,500 residents, 58% people of color
- Wastewater functions for 580,000 residents

NEAR-TERM FLOOD RISK IN ISLAIS CREEK / BAYVIEW

U.S. Army Corps of Engineers Flood Resiliency Study

Assets with current and near-term flood risk include:

- Heron's Head Park
- Recology
- Industrial and Maritime Uses and Jobs
- Pier 94 wetlands

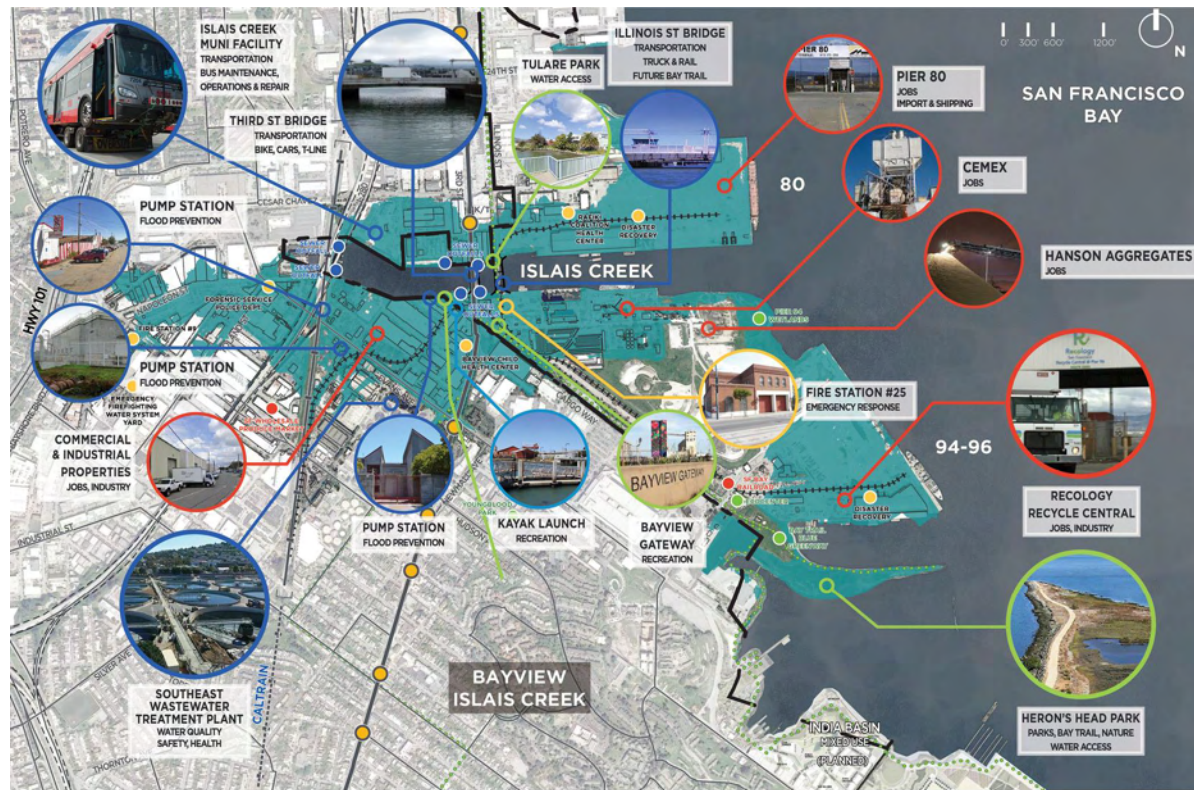


MID- TO LONG-TERM FLOOD RISK IN ISLAIS CREEK / BAYVIEW

U.S. Army Corps of Engineers Flood Resiliency Study

Mid- to long-term flood risk includes:

- Third Street and Illinois Street Bridges
- MUNI facilities that provide Citywide transit
- Industrial and Maritime uses and jobs
- Parks and open spaces
- Fire Station #25



100 years flood event + 3' SLR

FEEDBACK FROM “ASSET MAPPING” EXERCISE

Islais Creek / Bayview Feedback



- Bayview Opera House
- Candlestick Point
- Neighborhoods
- Parks and Open Space
- Heron’s Head
- Water Access
- Families and Communities
- Schools
- Community Based Organizations



- Housing
- Wastewater/ Sewage
- Third Street Bridge
- Transportation and Utilities
- Critical Facilities
- Jobs and Workforce Development
- Commercial Corridors and Local Industry



- Emergency Response
- Transportation
- Hospital Access
- Neighborhood Function
- Water Quality
- Contaminated lands
- Bayview/Hunters Point

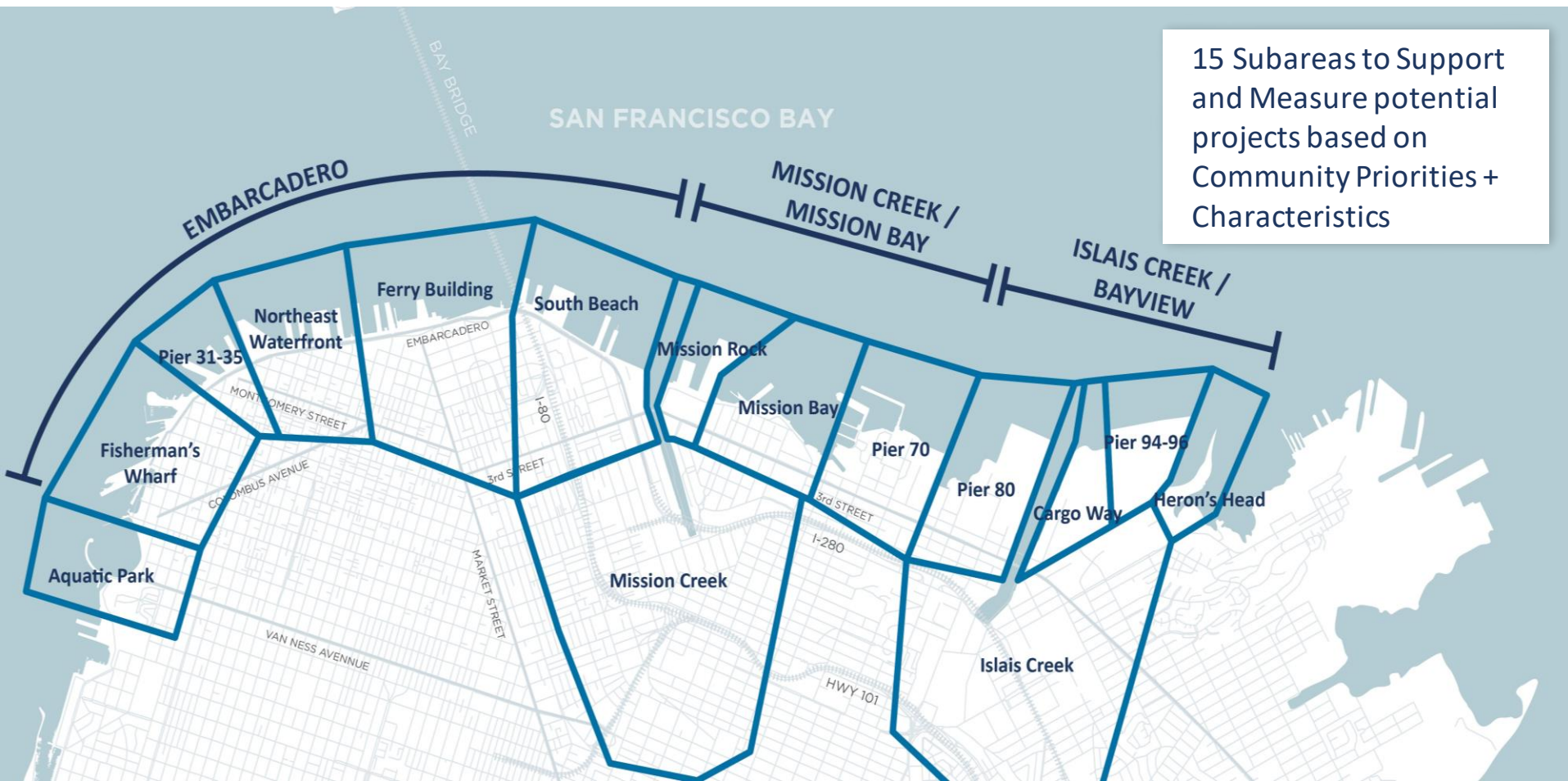
How Can We Reduce the Risk?

Waterfront "measures" to reduce risk



UNITED STATES ARMY CORPS OF ENGINEERS FLOOD STUDY AREA

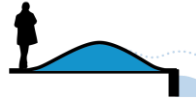
15 Subareas to Support and Measure potential projects based on Community Priorities + Characteristics



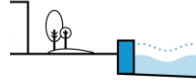
HOW CAN WE REDUCE FLOOD RISK?

Measures to Reduce Flood

Physical
and Policy



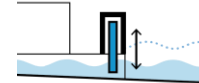
Levees



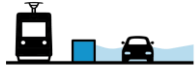
Seawalls



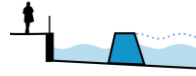
Raised Marine
Structures



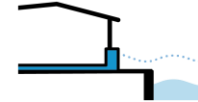
Tide Gates



Floodwalls



Breakwaters



Building
Adaptations



Deployables

Ecological



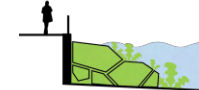
Ecological Marine
Structures



Ecological
Features



Aquatic
Habitat



Ecological
Shorelines

HOW WILL WE DECIDE HOW TO REDUCE THE RISK?

For Each of the 15 Subareas We Have Identified:

Measure Profile
Vegetated Revetment
Flood Adaptation Measure



ECOLOGICAL INFRASTRUCTURE



WATER LEVEL RANGE:
meets to surpasses

SHORELINE LOCATION:
Shoreline

DESIGN LIFE: Decades
ADAPTABILITY: Medium
IMPACT: Low

COASTAL FLOOD HAZARDS MITIGATED:
Enhancements can provide flood protection when:
Sea Level Rise, Storm Surge

MEASURES COMPATIBILITY:
Flood: Seawalls, Levees
Seismic: Nearshore Buttriss, Lintress, Buttress, Liquefaction Mitigation

DESCRIPTION:
Plantings can be added to the voids between a new or existing revetment to create a vegetated bank. Plants can slow flow, reduce erosion, and provide habitat. Marine matting can also be used to stabilize the bank.

CONSIDERATIONS:
• Design should anticipate migration pathways or repositioning as sea levels rise

ADVANTAGES:
• Enhance habitat
• Can be used in areas with low wave energy

DISADVANTAGES:
• Construction would require closure of waterfront buildings and relocation of berths when the work occurs at an occupied pier.
• Construction duration likely longer than other shoreline stabilization measures.
• Does not mitigate liquefaction-induced settlements.

Measure Profile
Super Bulkhead Wharf
Seismic Adaptation Measure



SHORELINE STABILIZATION



TYPE: Structural
SHORELINE LOCATION: Nearshore

DESIGN LIFE: 75+ years
ADAPTABILITY: Medium
IMPACT ON THE WATERFRONT: Moderate Waterside Intervention
CONSTRUCTION COST: High

SEISMIC HAZARDS MITIGATED:
Lateral Spreading, Liquefaction

SEISMIC PERFORMANCE IMPROVED:
Structures, Utilities and Transportation

MEASURES COMPATIBILITY:
Flood: Raised Marine Structures
Seismic: Liquefaction Mitigation, Utility Retrofit

DESCRIPTION:
New robust wharf structure that would replace the existing bulkhead wall & wharf and be strong and stiff enough to stabilize the rock pile. This will reduce lateral spreading ground displacements to The Embarcadero, but will not stop liquefaction of the Embarcadero fill.

CONSIDERATIONS:
• The quantity and diameter of the piles would be defined by the depth of the Young Bay Mud and bedrock which varies along the waterfront.
• Measure is less effective in areas of medium to deep Young Bay Mud.

ADVANTAGES:
• Less construction impact to the Embarcadero and Promenade compared to landslide shoreline stabilization measures.
• Replace deteriorated wharf structures. Can include wharf for future sea level rise protection.

DISADVANTAGES:
• Construction would require closure of waterfront buildings and relocation of berths when the work occurs at an occupied pier.
• Construction duration likely longer than other shoreline stabilization measures.
• Does not mitigate liquefaction-induced settlements.

- Community, city, and Port priorities and characteristics
- Critical assets and facilities
- Shoreline conditions and character
- Feasible ways to reduce seismic and current and future flood risk

HOW WILL WE DECIDE HOW TO REDUCE THE RISK?

Focused Array Themes

ECOLOGICAL ASSETS AND SERVICES



HISTORICAL AND CULTURAL



SEISMIC DISASTER RESPONSE



TRANSPORTATION MOBILITY
INFRASTRUCTURE



COMMUNITY COHESIVENESS



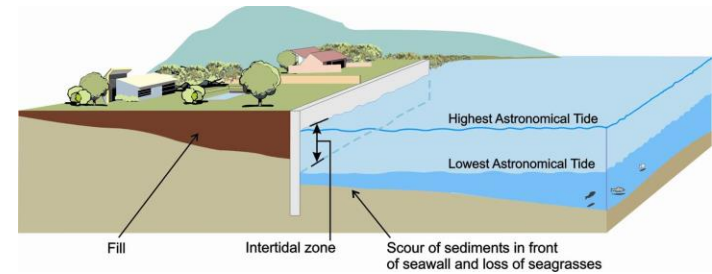
NON STRUCTURAL



HOW WILL WE REDUCE THE RISK?

Process for Developing Alternatives and Strategies

- Build upon community, City and Port priorities
- Understand existing and future conditions and characteristics
- Use repetition or multiple iterations to test out measures and strategies and obtain input
- Understand the above by ensuring everyone is at the table





Stakeholder Engagement

What We've Heard from Islais Creek / Bayview



FEEDBACK ON GEOGRAPHIC PROGRAM GOALS

Islais Creek / Bayview Feedback

PARTICIPANT'S HANDOUT
TABLE NUMBER:

SOUTHERN WATERFRONT DRAFT GOALS

WELCOME!
Islais Creek Adaptation Strategy
Waterfront Resilience Program,
Southern Waterfront
Workshop #2, Tuesday January 30th
8:00 Community Hall

OVERALL PROJECT GOAL:
A VISION FOR ISLAIS CREEK THAT ADAPTS TO FLOOD RISKS WHILE ENSURING HEALTHY AND RESILIENT COMMUNITIES

COMMUNITY & SOCIAL RESILIENCE

- Encourage neighborhood vitality, character, and diversity with more mixed-income housing
- Adapt buildings, open spaces and services that ensure the safety and preparedness of the district and city in the case of a flood emergency
- Develop equitable solutions with and for a wide variety of community members, including youth, seniors, families and people of color

TRANSPORTATION

- Build a long-lasting basis of support with a transparent, authentic engagement process
- Engage with youth to build long-term understanding, capacity, and stewardship
- Acknowledge the significance of the nearby designated African American Cultural District of Bayview Hunters Point, and other cultural groups, as central to developing future visions
- Engage with youth to build long-term understanding, capacity, and stewardship

ENVIRONMENT

- Adapt key transportation facilities to flooding to maintain operations, service and connectivity
- Improve connectivity between Bayview and other neighborhoods
- Improve pedestrian and bike connections to provide resilience during near term periods, flood events
- Create accessible transportation between the waterfront, the City and the region

ECONOMY

- Identify solutions and strategies that benefit the entire Islais Creek watershed
- Prioritize nature-based solutions and green infrastructure to mitigate floods, improve stormwater management and support local ecology
- Improve access to and create new resilient open spaces along the creek and bay shorelines to provide much needed recreational space for the surrounding neighborhoods
- Adapt flood-prone areas that currently support existing jobs, small businesses and local artists
- Support local, blue collar industrial jobs
- Use the planning process of this project as an opportunity to train and mentor individuals in the fields of design, planning and engineering
- Maintain and increase of women- and minority-owned businesses, community benefit organizations, worship centers, and arts and culture organizations



STRENGTHEN
1 FT OF SEA LEVEL RISE NOW - 2050

ADAPT
2 FT OF SEA LEVEL RISE 2050 - 2100

ENVISION
3 FT OF SEA LEVEL RISE 2100 - 2140

WHICH OBJECTIVES DO WE PRIORITIZE IN EACH PHASE?
HOW DO WE BALANCE ALL THE GOALS OVER TIME?

TABLE NUMBER:

- Prioritize homes, including low-income housing
- Prioritize environmental concerns
- Ensure anti-displacement is centered in any work
- Broad support for the Embarcadero Seawall Program as addressing risk is important to the entire City, including the Bayview
- That said, prioritize resilience projects in the southern waterfront
- Continue engagement along the Port's entire 7.5 mile jurisdiction

HOW THIS ENGAGEMENT EFFORT INFORMED THE WRP

Community Input Helped Refine WRP

1

Community feedback affirmed focus on **life safety & emergency response** and offered ideas for evolving how we understand “inspiring an adaptable waterfront”:

- Connecting
- Accessible
- Supporting jobs, housing, seniors & youth

2

Community feedback affirmed the Port goals and encouraged:

- Transparency
- Accountability
- Engagement
- **Prioritize assets most loved by the community and most important to the city**
- Select projects that responsibly use tax dollars

3

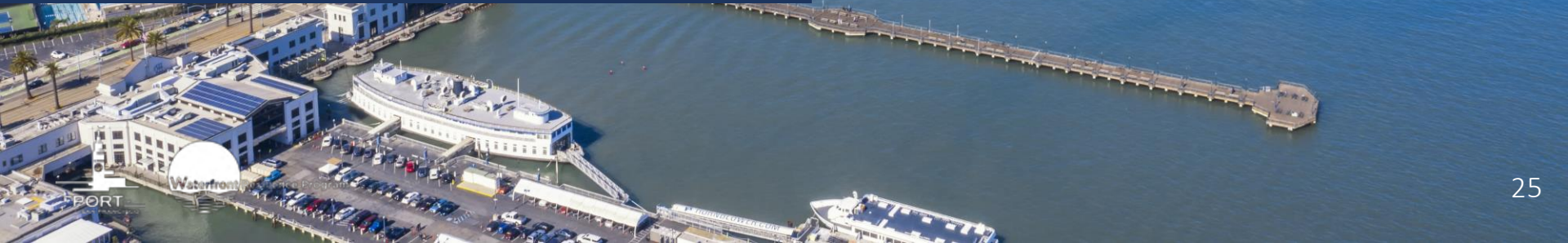
Community feedback on evaluation criteria affirmed the Port’s key focus on life safety and disaster response

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- Assets and services most prioritized: housing, disaster recovery facilities, utilities, and businesses
- Key focus on transportation assets



Next Steps

What's Next for the Waterfront Resilience Program?



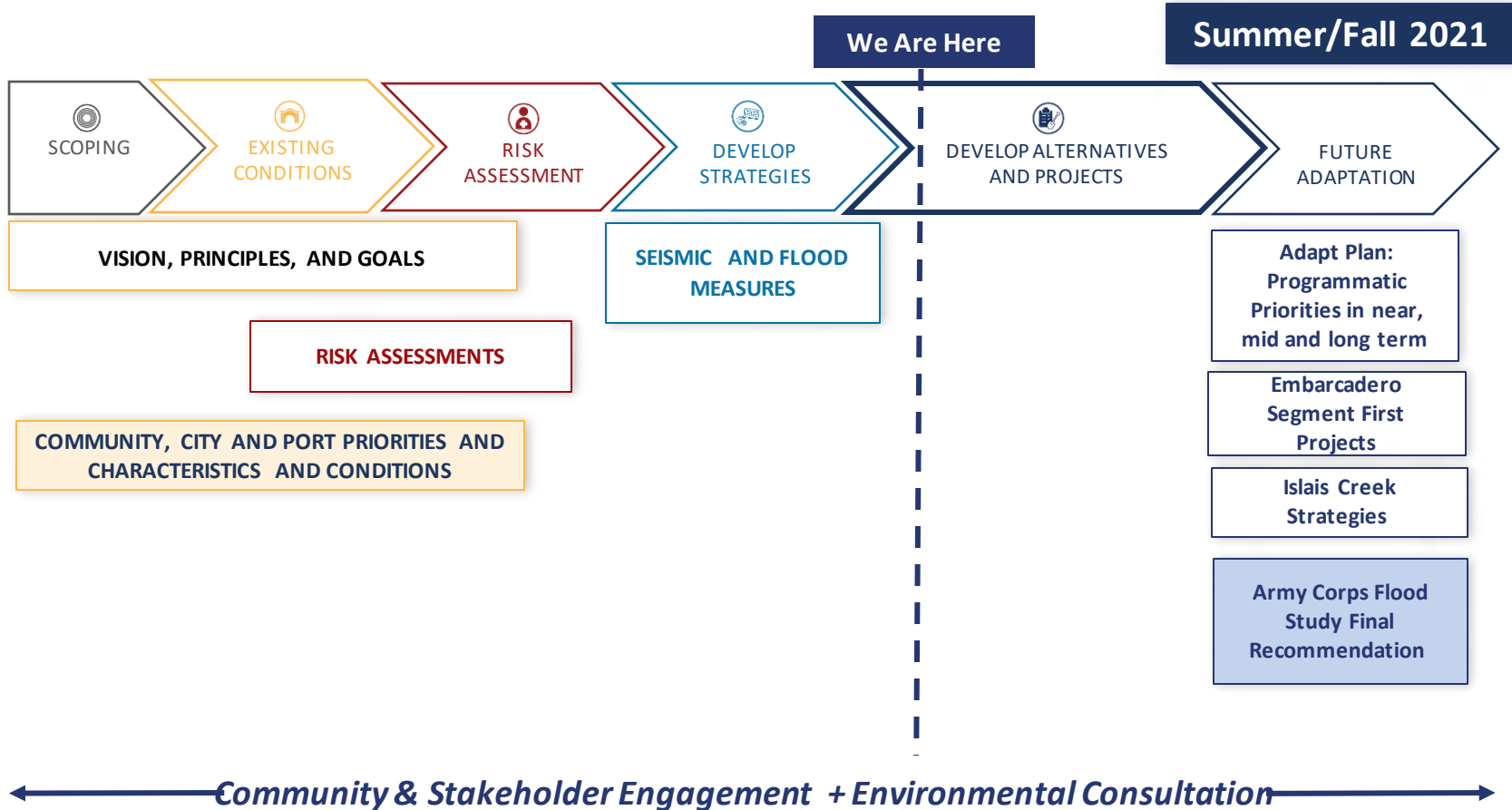
EMBARCADERO SEAWALL PROGRAM

Program Overview



- **Project Area:** Fisherman's Wharf to Mission Creek
- **Timing:** 2017 to 2021 project planning followed by implementation / construction
- **Focus:** Seismic and flood risk associated with the Embarcadero Seawall
- **Funding:** \$425 million General Obligation Bond passed in November 2018

WATERFRONT RESILIENCE PROGRAM STEPS



JOB AND CAREER OPPORTUNITIES

Coming Soon...



Job Opportunities May Include:

- Pile Drivers
- Welders
- Laborers
- Cement Masons
- Operating Engineers
- Carpenters
- Painters
- Office Engineers
- Schedulers and Document Controls
- Construction Administrative

SMALL & LOCAL BUSINESS CONTRACT OPPORTUNITIES

Coming Soon...



Upcoming Contracts May Include:

Professional Services:

- Engineering
- Design
- Environmental
- Planning

Construction

- Demolition
- Excavation
- Pavement and sidewalk removal
- Electrical

UPCOMING COMMUNITY ENGAGEMENT

Engagement Planned for Early 2021

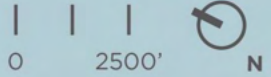


- Meetings co-hosted with community-based organizations in Islais Creek / Bayview and Mission Creek / Mission Bay
- Ongoing digital engagement, including feedback on waterfront-wide measures and Waterfront Resilience Story Maps
- Ongoing tenant engagement
- Youth engagement with youth-serving organizations that serve citywide youth



FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Physical Measures Applied to the Southern Waterfront



Mission Bay identified measures include:

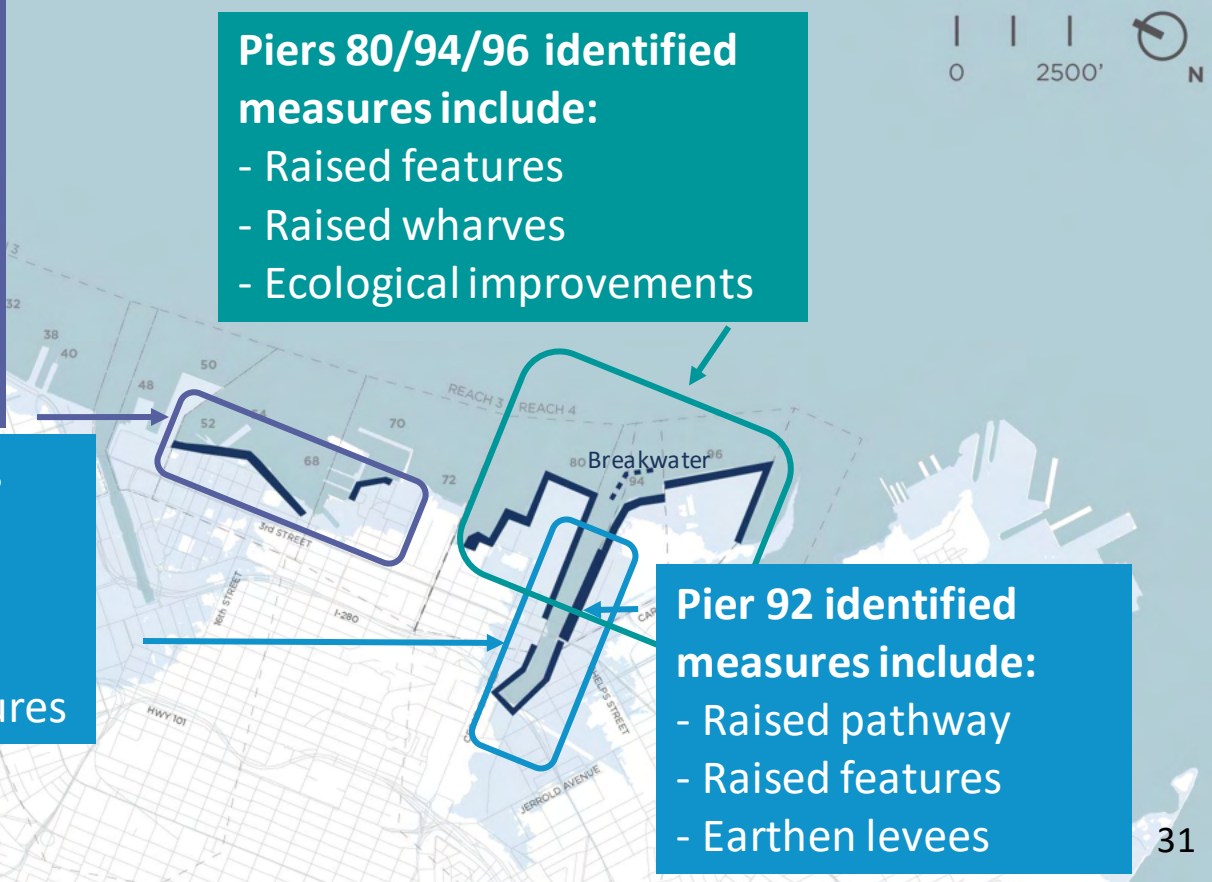
- Levee with banks to reduce erosion
- Raised pathway / Raised features
- Native, Vegetated Terraces

Piers 80/94/96 identified measures include:

- Raised features
- Raised wharves
- Ecological improvements

Islais Creek identified measures include:

- Tidal gates and barriers
- Raised bridges
- Raised pathways / Raised features



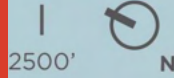
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■ INLAND STRUCTURAL MEASURES
- - - BREAKWATERS - EVALUATION IN FUTURE DESIGN PHASES

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Non-Structural Measures Applied to the Southern Waterfront

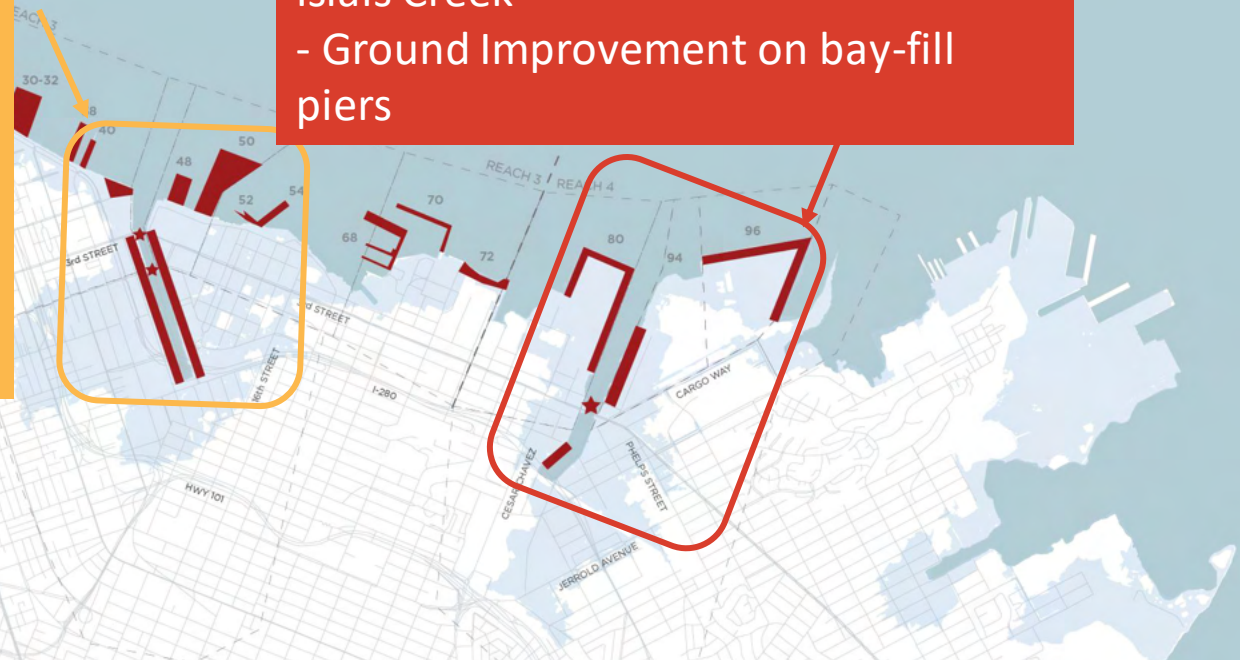


Mission Creek and Pier 80 policy considerations:

- Structures elevation (Park in front of Oracle Park + Bridges across the creek)
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 POLICY CONSIDERATION, INCLUDING STRUCTURE RELOCATION AND REMOVAL

 Raised Bridges

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Nature Based Measures Applied to the Southern Waterfront



Central Waterfront:

- Combination of beaches and vegetated banks bayward at Bayfront Park and Pier 70

Piers 80/94/96:

- Stepped slopes and vegetated banks softening the edges at Warm Water Cove, Pier 94 wetlands and Heron's Head.
- Room for the creek and softening the edges of the creek

Islais Creek:

- Stepped slopes reshaping the geography of Islais Creek





Thank You!

Lindy Lowe, Port of San Francisco
lindy.lowe@sfport.com



Waterfront Resilience Program Update

Hunters Point Shipyard Citizens Advisory
Committee

February 8, 2021



Waterfront Resilience Program





Waterfront Resilience Program

Overview

WATERFRONT RESILIENCE PROGRAM

Goal 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.



WATERFRONT RESILIENCE PROGRAM DRAFT PRINCIPLES

Affirmed through Robust Community Engagement

- **Prioritize** life safety and emergency response
- **Advance** equity throughout the Waterfront Resilience Program, including through community and stakeholder engagement, planning, contracting, jobs and decision making
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WATERFRONT RESILIENCE PROGRAM DRAFT PRINCIPLES CONT.

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- **Inspire** an adaptable waterfront that:
 - Improves the health of the Bay
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 - Protects and preserves historic and maritime resources
 - Provides opportunities for diverse families, businesses, and neighborhoods to thrive
- **Lead** a transparent, innovative, collaborative, and adaptive Resilience Program



WATERFRONT RESILIENCE PROGRAM EFFORTS

Program and City Resilience Projects and Efforts



INTER-AGENCY CLIMATE RESILIENCE EFFORTS



**SLR
Vulnerability &
Consequences
Assessment**



**Ocean Beach
Adaptation**



**Hazard &
Climate
Resilience
Plan**



**Climate
Action
Strategy**



**Waterfront
Resilience
Program (Flood
Study
& Seawall)**



**Strengthen
Adapt
Envision**



**Waterfront
Plan
Update**



**Islais Creek
Adaptation
Strategy**



**CR
General Plan
Updates**

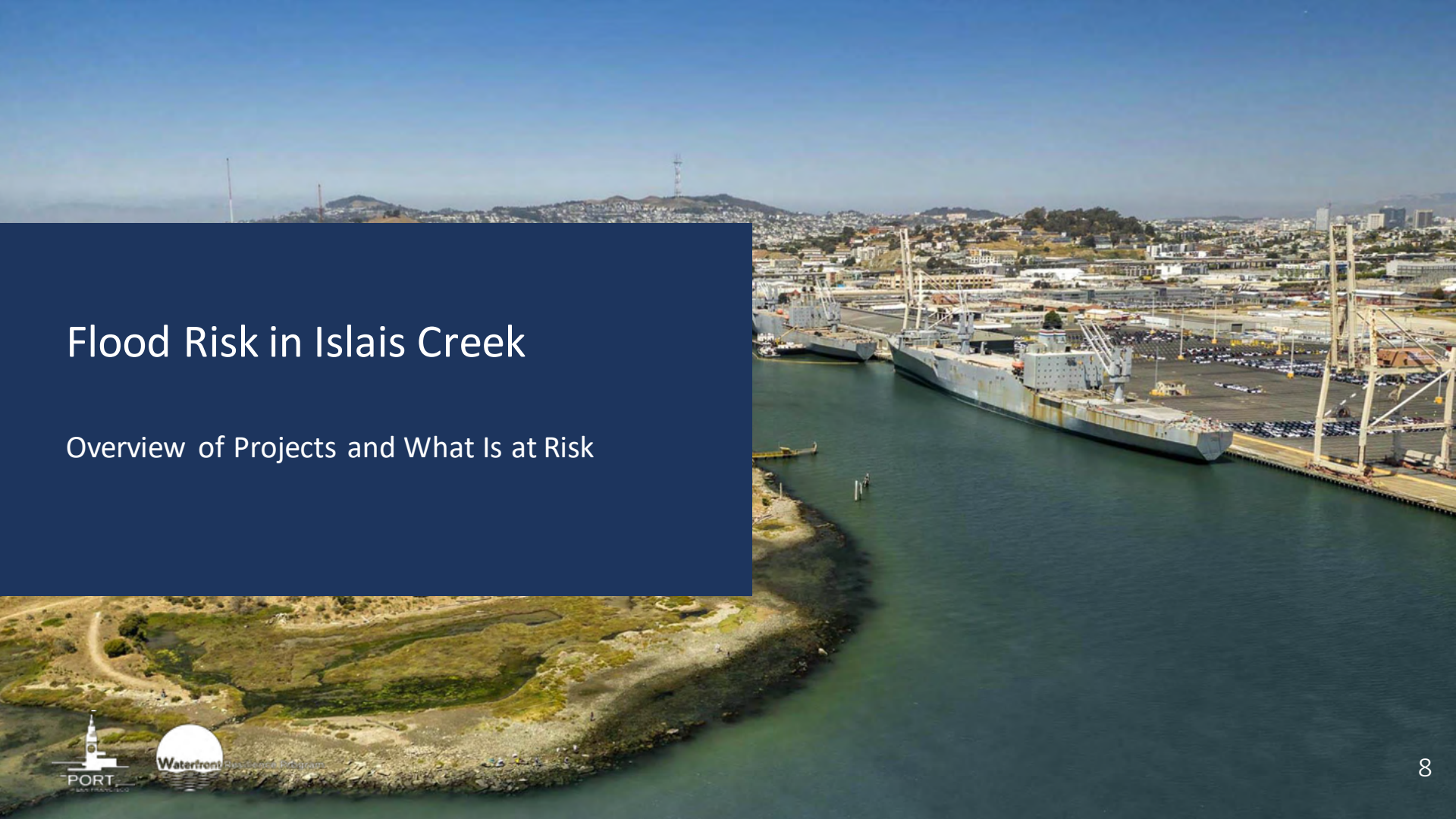


**Bayview
Resilience
Strategy**



Flood Risk in Islais Creek

Overview of Projects and What Is at Risk



U.S. ARMY CORPS OF ENGINEERS (USACE) FLOOD RESILIENCY STUDY

Overview and Key Highlights



- Port is local sponsor of 5- to 7-year study
- Flood risk assessment to identify near- mid- and long-term strategies to address shoreline and creek flooding and sea level rise
- Robust community and stakeholder input
- If the Federal government partners with the Port on a project, they will contribute 65% of its cost

ISLAIS CREEK ADAPTATION STRATEGY

Overview and Key Highlights



- Led by SF Planning in partnership with Port, SFMTA, SFPUC
- Two-year community planning process
- Develop a long-range vision for the Islais Creek shoreline and identify near- and mid-term strategies to address sea level rise

ISLAIS CREEK VISION & GOALS

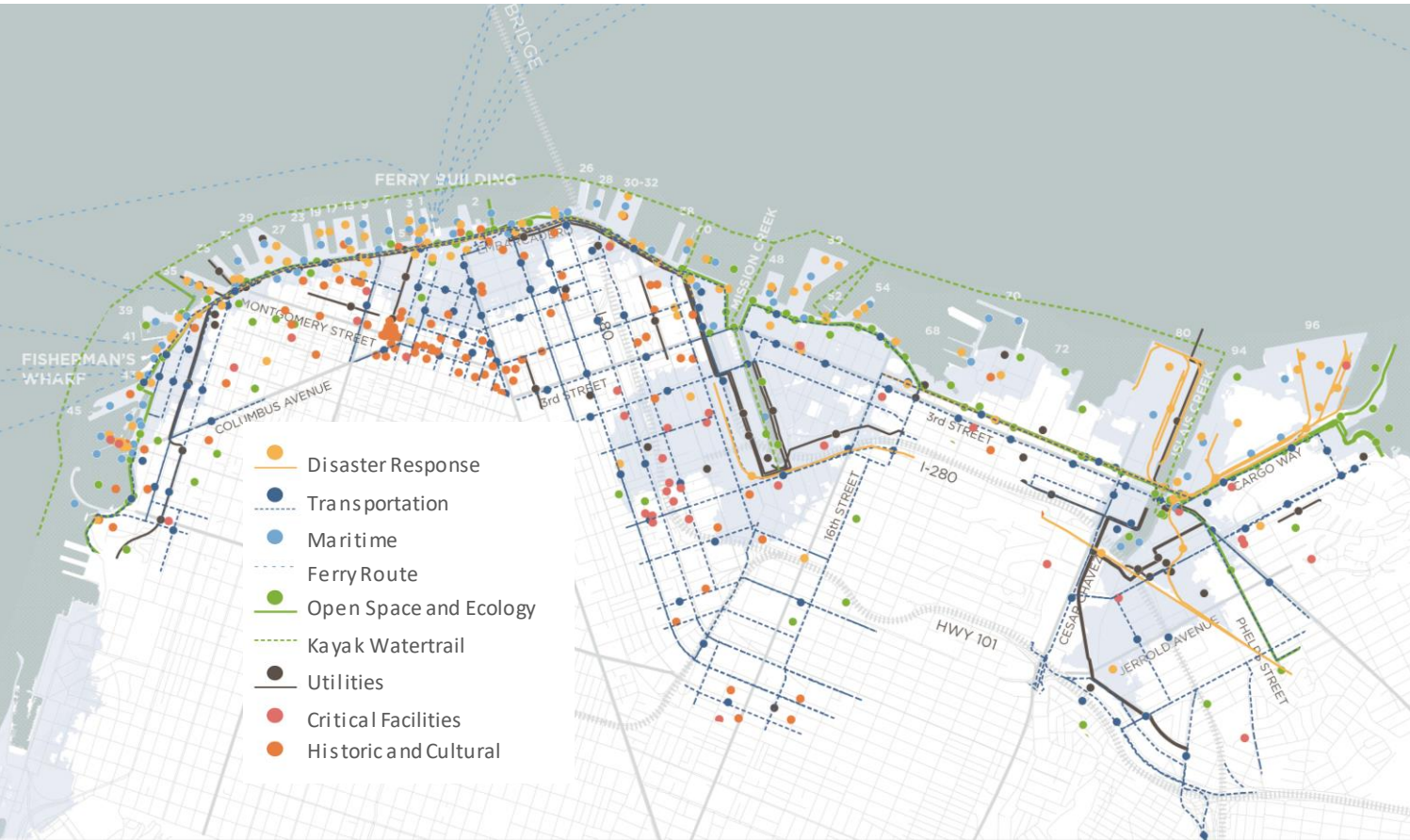


Islais Creek adapts to flood risks while ensuring healthy and resilient communities.

1. A socially and environmentally resilient neighborhood
2. Authentic and transparent public engagement during and beyond planning
3. A transportation system that is resilient and adaptable to flood risk
4. A healthy environment for residents, workers and ecologies
5. A sustainable economy that benefits local residents, workers and industries

Study Wide Assets at Risk

U.S. Army Corps of Engineers Flood Resiliency Study



At Risk:

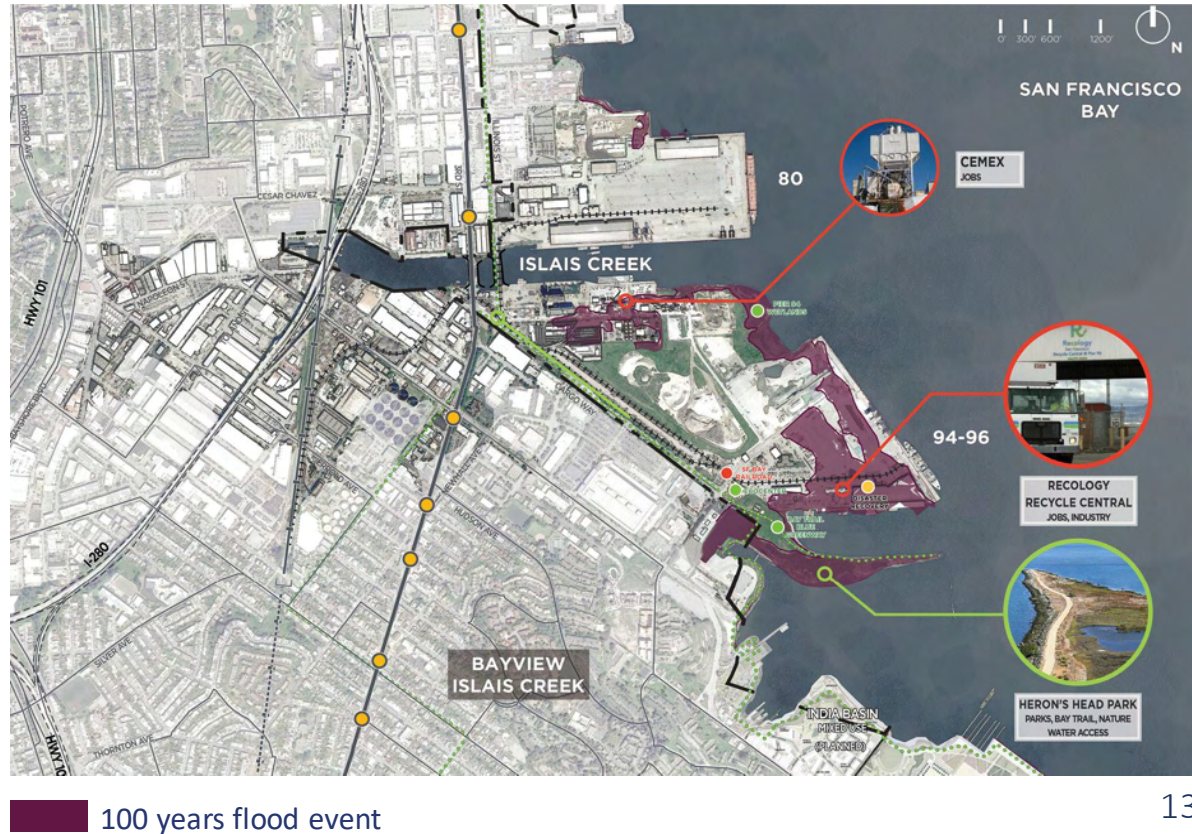
- 40 miles of roadway
- 25 miles of Muni & cable car track
- 11,000 jobs
- 13,500 residents, 58% people of color
- Wastewater functions for 580,000 residents

NEAR-TERM FLOOD RISK IN ISLAIS CREEK / BAYVIEW

U.S. Army Corps of Engineers Flood Resiliency Study

Assets with current and near-term flood risk include:

- Heron's Head Park
- Recology
- Industrial and Maritime Uses and Jobs
- Pier 94 wetlands

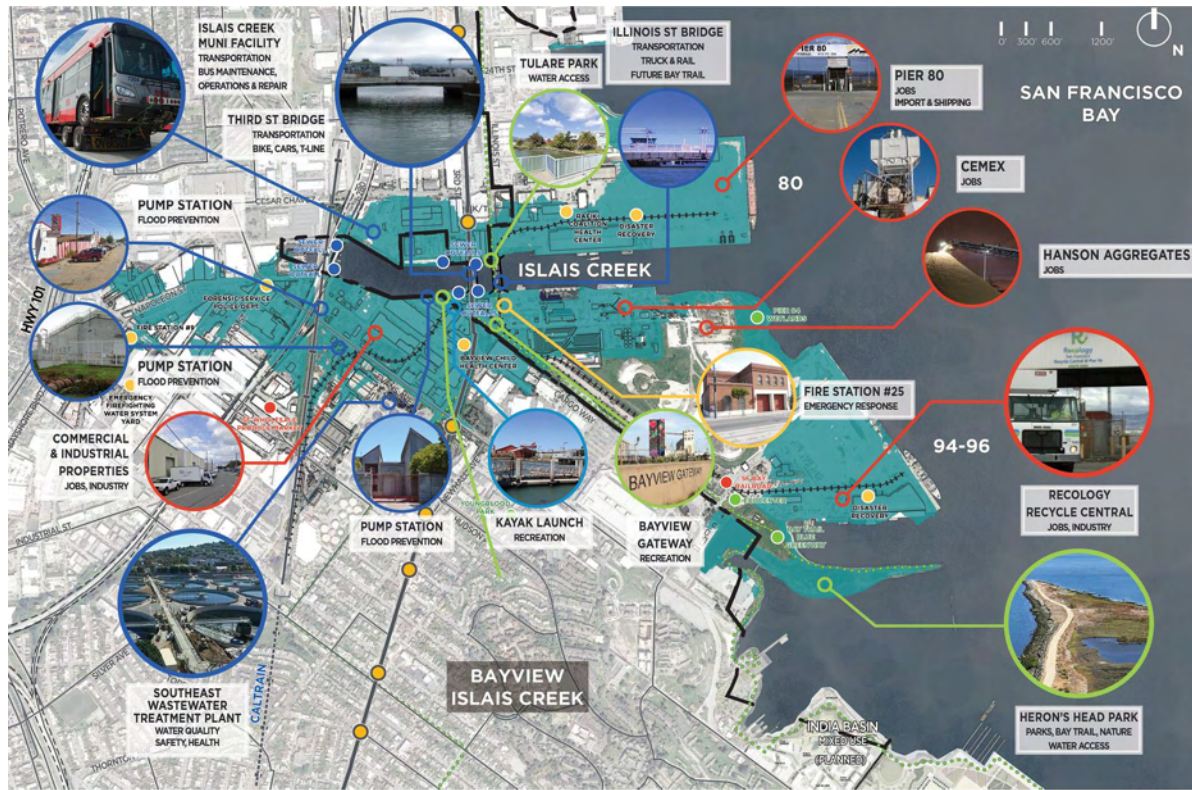


MID- TO LONG-TERM FLOOD RISK IN ISLAIS CREEK / BAYVIEW

U.S. Army Corps of Engineers Flood Resiliency Study

Mid- to long-term flood risk includes:

- Third Street and Illinois Street Bridges
- MUNI facilities that provide Citywide transit
- Industrial and Maritime uses and jobs
- Parks and open spaces
- Fire Station #25



100 years flood event + 3' SLR

FEEDBACK FROM “ASSET MAPPING” EXERCISE

Islais Creek / Bayview Feedback



- Bayview Opera House
- Candlestick Point
- Neighborhoods
- Parks and Open Space
- Heron’s Head
- Water Access
- Families and Communities
- Schools
- Community Based Organizations



- Housing
- Wastewater/ Sewage
- Third Street Bridge
- Transportation and Utilities
- Critical Facilities
- Jobs and Workforce Development
- Commercial Corridors and Local Industry



- Emergency Response
- Transportation
- Hospital Access
- Neighborhood Function
- Water Quality
- Contaminated lands
- Bayview/Hunters Point

What people love about the waterfront

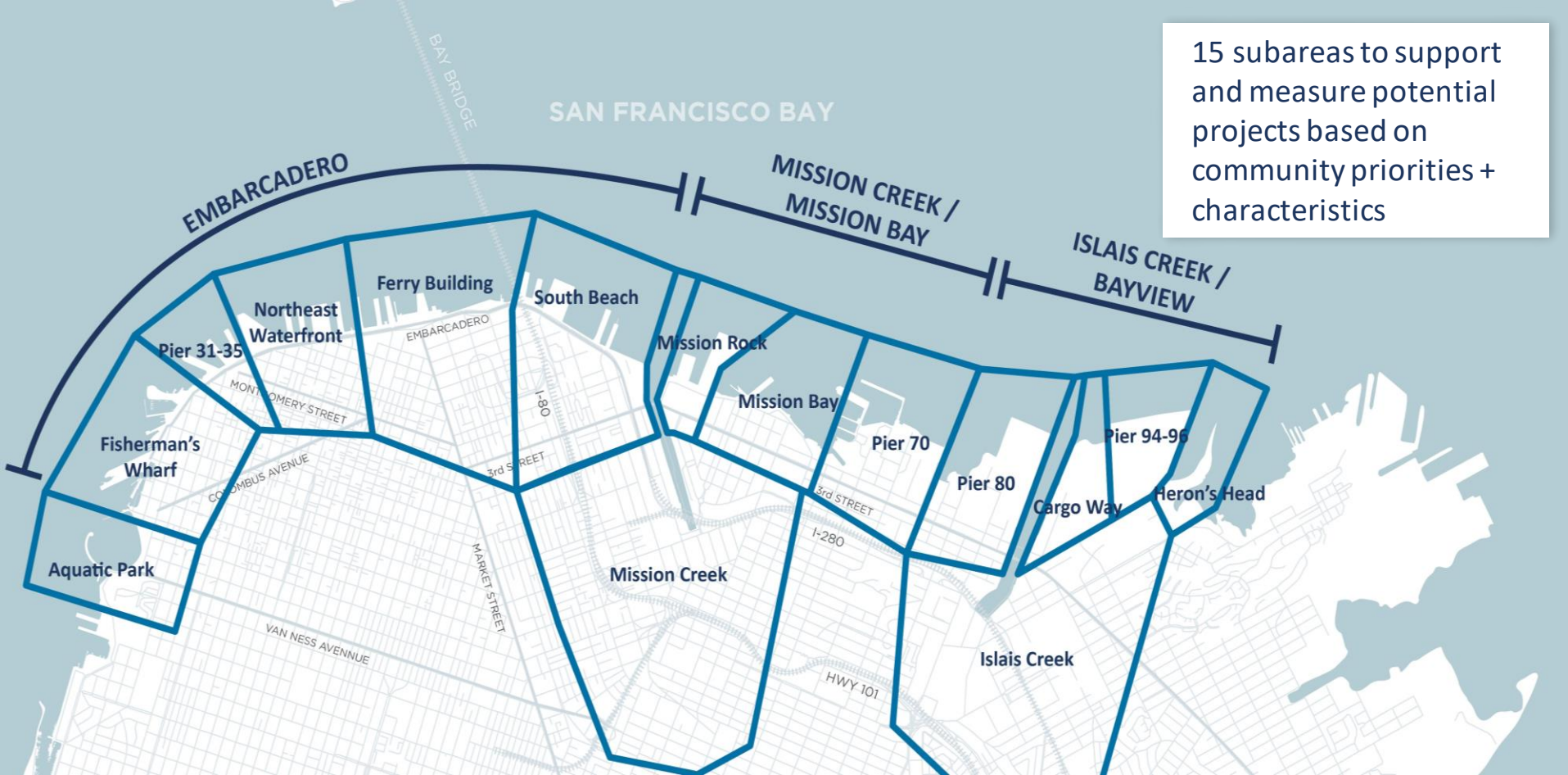
Assets important to the City

Concerns during a disaster

How Can We Reduce the Risk?

Waterfront "measures" to reduce risk

U.S. ARMY CORPS OF ENGINEERS FLOOD RESILIENCY STUDY AREA

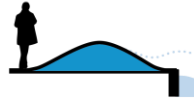


15 subareas to support and measure potential projects based on community priorities + characteristics

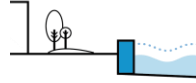
HOW CAN WE REDUCE FLOOD RISK?

Measures to Reduce Flood Risk

Physical
and Policy



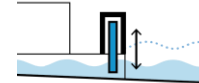
Levees



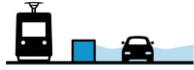
Seawalls



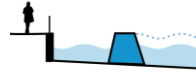
Raised Marine
Structures



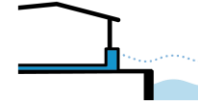
Tide Gates



Floodwalls



Breakwaters



Building
Adaptations



Deployables

Ecological



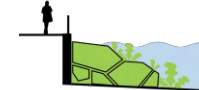
Ecological Marine
Structures



Ecological
Features



Aquatic
Habitat



Ecological
Shorelines

HOW WILL WE DECIDE HOW TO REDUCE THE RISK?

For Each of the 15 Subareas We Have Identified:

Measure Profile
Vegetated Revetment
Flood Adaptation Measure



ECOLOGICAL INFRASTRUCTURE



WATER LEVEL RANGE:
meets to surpasses

SHORELINE LOCATION:
Shoreline

DESIGN LIFE	ADAPTABILITY	IMPACT
Decades	Medium	Low

COASTAL FLOOD HAZARDS MITIGATED:
Enhancements can provide flood protection when:
Sea Level Rise
Storm Surge

MEASURES COMPATIBILITY:

Flood	Seismic	ECOS
Nearshore	Buttress, Landside	
Seawall, Levee	Buttress, Liquefaction Mitigation	

DESCRIPTION:
Plantings can be added to the voids between a new or existing revetment to create riparian and fish habitat. Plants can slow flow and protect coastal shorelines and river bars. Riparian revegetation can also protect coastal shorelines and river bars. Riparian revegetation can also protect coastal shorelines and river bars.

CONSIDERATIONS:

<ul style="list-style-type: none"> Design should anticipate migration pathways or repositioning as sea levels rise 	<ul style="list-style-type: none"> Ech Can hab
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PORT of SAN FRANCISCO | Waterfront Resilience Program

Measure Profile
Super Bulkhead Wharf
Seismic Adaptation Measure



SHORELINE STABILIZATION



TYPE: Structural

SHORELINE LOCATION:
Nearshore



Example of piles installed to support new wharf structure ©JGH

DESIGN LIFE	ADAPTABILITY	IMPACT ON THE WATERFRONT	CONSTRUCTION COST
75+ years	Medium	Moderate Waterside Intervention	High

SEISMIC HAZARDS MITIGATED:
Lateral Spreading, Liquefaction

SEISMIC PERFORMANCE IMPROVED:
Structures, Utilities and Transportation

MEASURES COMPATIBILITY:

Flood	Seismic
Raised Marine Structures	Liquefaction Mitigation Utility Retrofit

DESCRIPTION:
New robust wharf structure that would replace the existing bulkhead wall & wharf and be strong and stiff enough to stabilize the rock dike. This will reduce lateral spreading ground displacements to The Embarcadero, but will not stop liquefaction of the Embarcadero fill.

CONSIDERATIONS:

- The quantity and diameter of the piles would be defined by the depth of the Young Bay Mud and bedrock which varies along the waterfront.
- Measure is less effective in areas of medium to deep Young Bay Mud.

ADVANTAGES:

- Less construction impact to the Embarcadero and Promenade compared to landside shoreline stabilization measures.
- Replace deteriorated wharf structures. Can include wharf for future sea level rise protection.

DISADVANTAGES:

- Construction would require closure of waterfront buildings and relocation of barges when the work occurs at an occupied pier.
- Construction duration likely longer than other shoreline stabilization measures.
- Does not mitigate liquefaction-induced settlements.

PORT of SAN FRANCISCO | Waterfront Resilience Program

Waterfront Resilience Program | Measure Profile | Page 1

- Community, City, and Port priorities and characteristics
- Critical assets and facilities
- Shoreline conditions and character
- Feasible ways to reduce seismic and current and future flood risk

HOW WILL WE DECIDE HOW TO REDUCE THE RISK?

Focused Array Themes

ECOLOGICAL ASSETS AND SERVICES



HISTORICAL AND CULTURAL



SEISMIC DISASTER RESPONSE



TRANSPORTATION MOBILITY
INFRASTRUCTURE



COMMUNITY COHESIVENESS



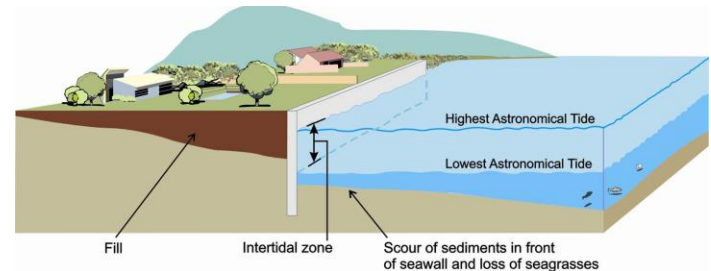
NON STRUCTURAL



HOW WILL WE REDUCE THE RISK?

Process for Developing Alternatives and Strategies

- Build upon community, City and Port priorities
- Understand existing and future conditions and characteristics
- Use repetition or multiple iterations to test out measures and strategies and obtain input
- Understand the above by ensuring everyone is at the table





Stakeholder Engagement

What We've Heard from Islais Creek / Bayview



FEEDBACK ON GEOGRAPHIC PROGRAM GOALS

Islais Creek / Bayview Feedback

PARTICIPANT'S HANDOUT
TABLE NUMBER:

SOUTHERN WATERFRONT DRAFT GOALS

WELCOME!
Islais Creek Adaptation Strategy
Waterfront Resilience Program,
Southern Waterfront
Workshop #2, Tuesday January 30th
8:00 Community Facility

OVERALL PROJECT GOAL:
A VISION FOR ISLAIS CREEK THAT ADAPTS TO FLOOD RISKS WHILE ENSURING HEALTHY AND RESILIENT COMMUNITIES

COMMUNITY & SOCIAL RESILIENCE

- Encourage neighborhood vitality, character, and diversity with more mixed-income housing
- Adapt buildings, open spaces and services that ensure the safety and preparedness of the district and city in the case of a flood emergency
- Develop equitable solutions with and for a wide variety of community members, including youth, seniors, families and people of color

EXPERIENCE

AUTHENTIC AND TRANSPARENT PUBLIC ENGAGEMENT DURING AND BEYOND THE PLANNING PHASE

- Build a long-lasting basis of support with a transparent, authentic engagement process
- Engage with youth to build long-term understanding, capacity, and stewardship
- Acknowledge the significance of the nearby designated African American Cultural District of Bayview Hunters Point, and other cultural groups, as central to developing future visions
- Engage with youth to build long-term understanding, capacity, and stewardship

TRANSPORTATION

A TRANSPORTATION SYSTEM THAT IS RESILIENT AND ADAPTABLE TO FLOOD RISK

- Adapt key transportation facilities to flooding to maintain operations, service and connectivity
- Improve connectivity between Bayview and other neighborhoods
- Improve pedestrian and bike connections to provide resilience during near term periods, flood events
- Create accessible transportation between the waterfront, the City and the region

ENVIRONMENT

A HEALTHY ENVIRONMENT FOR RESIDENTS, WORKERS, AND ECOLOGIES

- Identify solutions and strategies that benefit the entire Islais Creek watershed
- Prioritize nature-based solutions and green infrastructure to mitigate floods, improve stormwater management and support local ecology
- Improve access to and create new resilient open spaces along the creek and bay shorelines to provide much needed recreational space for the surrounding neighborhoods

ECONOMY

A SUSTAINABLE ECONOMY THAT BENEFITS LOCAL RESIDENTS, WORKERS, AND INDUSTRIES

- Adapt flood-prone areas that currently support existing jobs, small businesses and local artists
- Support local, blue collar industrial jobs
- Use the planning process of this project as an opportunity to train and mentor individuals in the fields of design, planning and engineering
- Maintain and increase of women- and minority-owned businesses, community benefit organizations, worship centers, and arts and culture organizations



STRENGTHEN
10 FT OF SEA LEVEL RISE NOW - 2050

ADAPT
12 FT OF SEA LEVEL RISE 2050 - 2100

ENVISION
14 FT OF SEA LEVEL RISE 2100 - 2140

**WHICH OBJECTIVES DO WE PRIORITIZE IN EACH PHASE?
HOW DO WE BALANCE ALL THE GOALS OVER TIME?**

TABLE NUMBER:

- Prioritize homes, including low-income housing
- Prioritize environmental concerns
- Ensure anti-displacement is centered in any work
- Broad support for the Embarcadero Seawall Program as addressing risk is important to the entire City, including the Bayview
- That said, prioritize resilience projects in the Southern waterfront
- Continue engagement along the Port's entire 7.5 mile jurisdiction

HOW THIS ENGAGEMENT EFFORT INFORMED THE WRP

Community Input Helped Refine WRP

1

Community feedback affirmed focus on **life safety & emergency response** and offered ideas for evolving how we understand “inspiring an adaptable waterfront”:

- Connecting
- Accessible
- Supporting jobs, housing, seniors & youth

2

Community feedback affirmed the Port goals and encouraged:

- Transparency
- Accountability
- Engagement
- **Prioritize assets most loved by the community and most important to the city**
- Select projects that responsibly use tax dollars

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Next Steps

What's Next for the Waterfront Resilience Program?



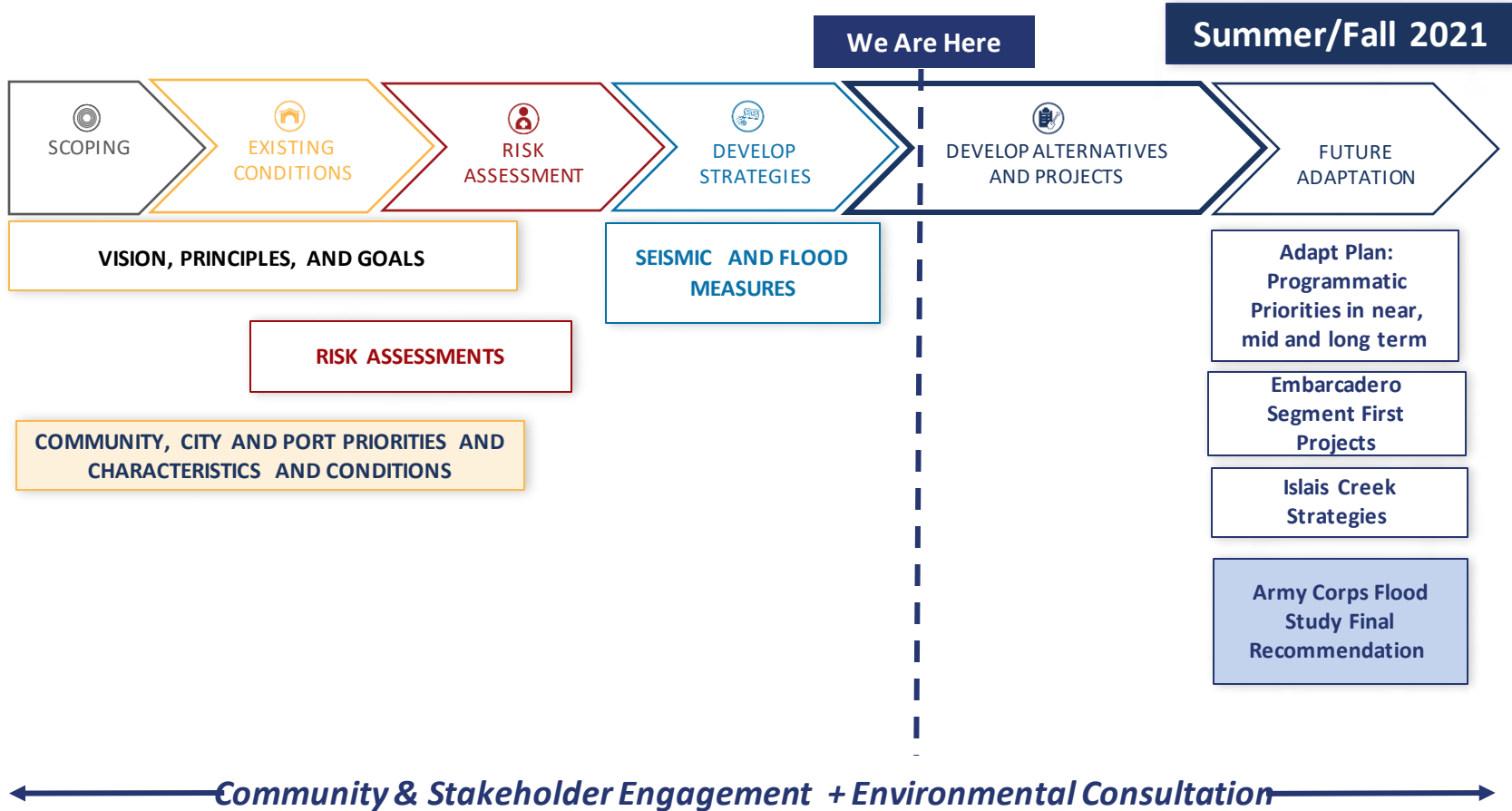
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Construction

- Demolition
- Excavation
- Pavement and sidewalk removal
- Electrical

UPCOMING COMMUNITY ENGAGEMENT

Join Us for Virtual Office Hours



Tuesday, February 9, 12:00 – 1:00 PM

Wednesday, February 24, 5:00-6:00 PM

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Engagement Planned for Early 2021



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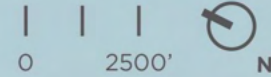


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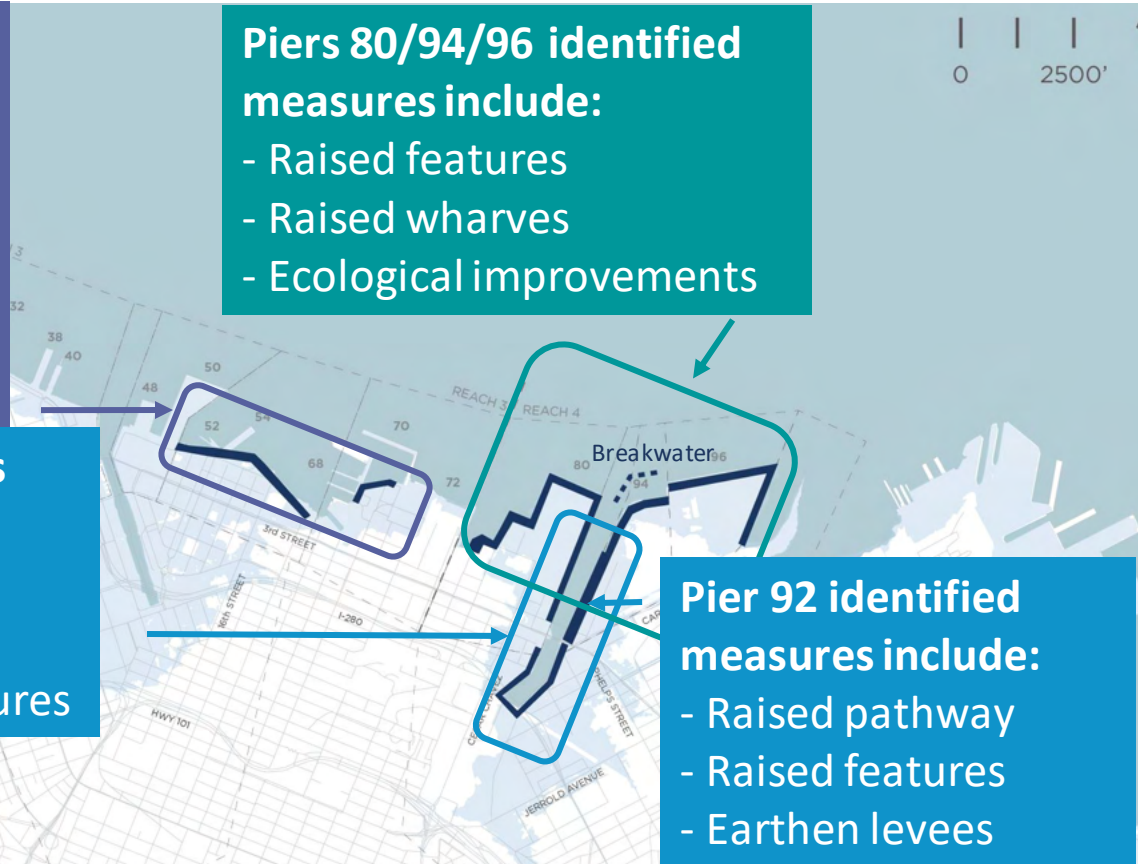


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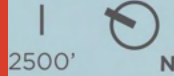
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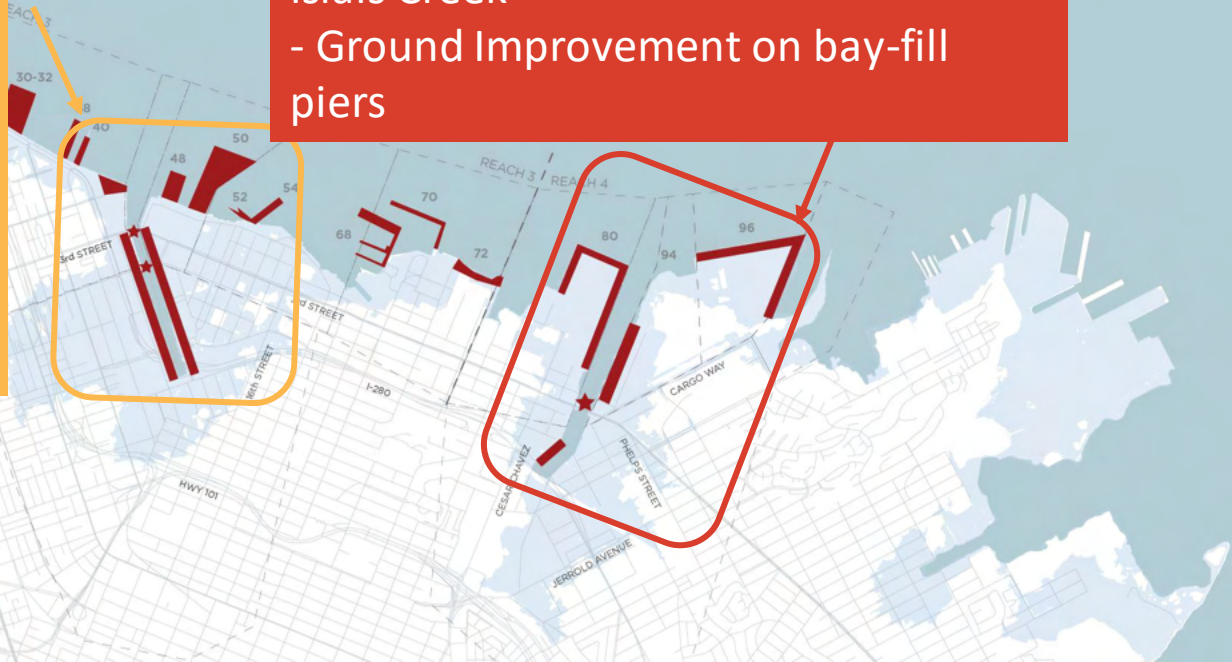


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- Room for the creek and softening the edges of the creek

Islais Creek:

- Stepped slopes reshaping the geography of Islais Creek



A photograph of two children riding bicycles on a dirt path. The child in the foreground is wearing a red and white jersey and a yellow helmet. The child in the background is wearing a dark jersey with the number 30 and a dark helmet. In the background, a large ship is visible in a harbor under a clear blue sky.

Thank You!

David Beaupre, Port of San Francisco
david.beaupre@sfport.com

Brad Benson, Port of San Francisco
brad.benson@sfport.com



Waterfront Resilience Program Update

Southeast Community Facility Commission:
Facility & Design Advisory Committee

February 11, 2021



Waterfront Resilience Program



Waterfront Resilience Program

Overview

WATERFRONT RESILIENCE PROGRAM

Goal Statement

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Vulnerability &
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Assessment**



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**Hazard &
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**Climate
Action
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**Waterfront
Resilience
Program (Flood
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**Strengthen
Adapt
Envision**



**Waterfront
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Update**



**Islais Creek
Adaptation
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General Plan
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**Bayview
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Flood Risk in Islais Creek

Overview of Projects and What Is at Risk



U.S. ARMY CORPS OF ENGINEERS (USACE) FLOOD RESILIENCY STUDY

Overview and Key Highlights



- Port is local sponsor of 5- to 7.5-year study
- Flood risk assessment to identify near- mid- and long-term strategies to address shoreline and creek flooding and sea level rise
- Robust community and stakeholder input
- If the Federal government partners with the Port on a project, they will contribute 65% of its cost

ISLAIS CREEK ADAPTATION STRATEGY

Overview and Key Highlights



- Led by SF Planning in partnership with Port, SFMTA, SFPUC
- Two-year community planning process
- Develop a long-range vision for the Islais Creek shoreline and identify near- and mid-term strategies to address sea level rise

ISLAIS CREEK VISION & GOALS

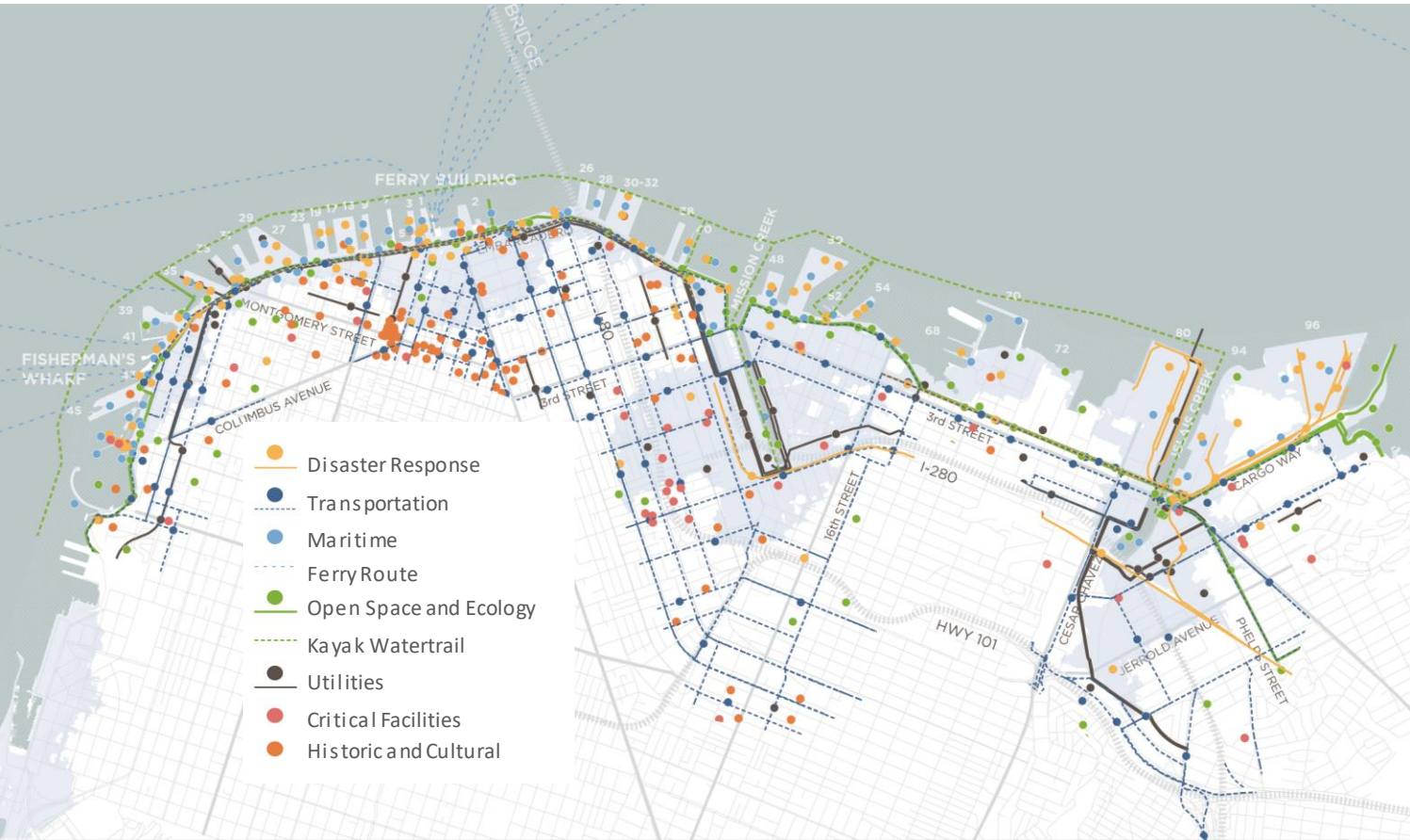


Islais Creek adapts to flood risks while ensuring healthy and resilient communities.

1. A socially and environmentally resilient neighborhood
2. Authentic and transparent public engagement during and beyond Planning
3. A transportation system that is resilient and adaptable to flood risk
4. A healthy environment for residents, workers and ecologies
5. A sustainable economy that benefits local residents, workers and industries

Study Wide Assets at Risk

U.S. Army Corps of Engineers Flood Resiliency Study



At Risk:

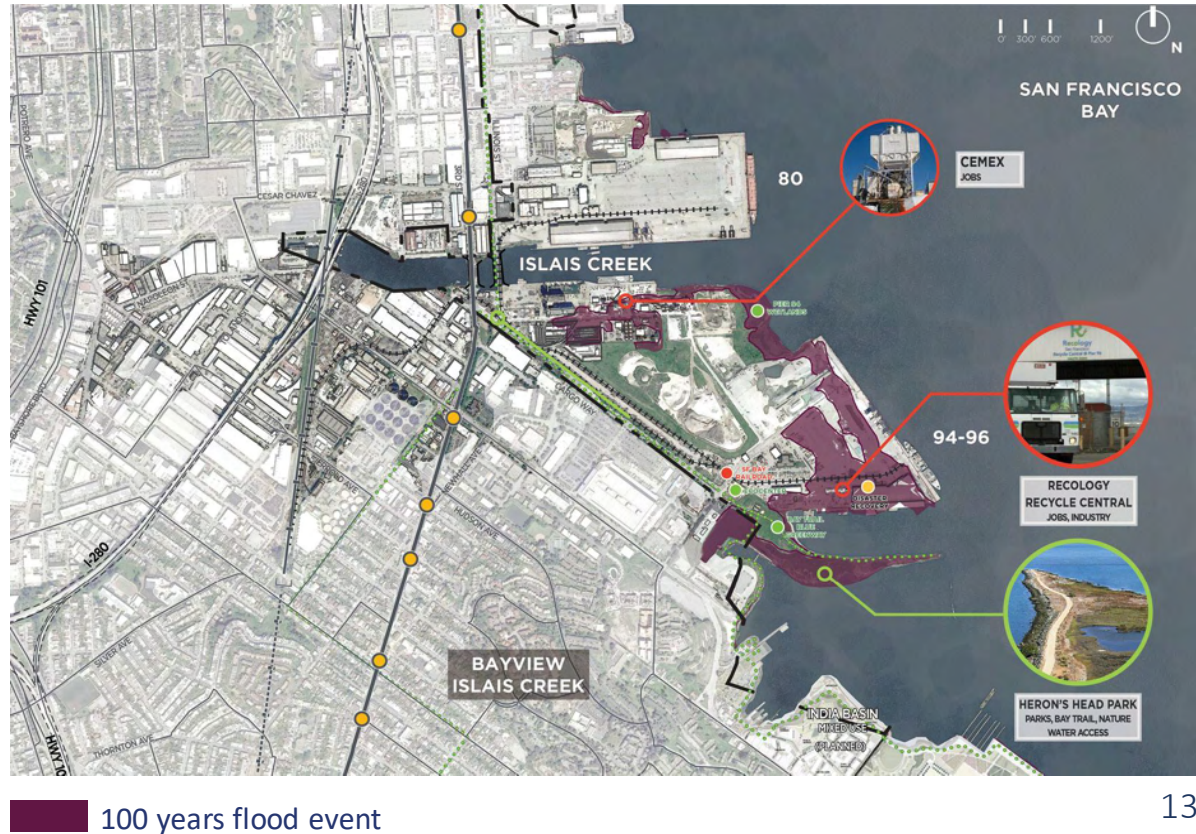
- 40 miles of roadway
- 25 miles of Muni & cable car track
- 11,000 jobs
- 13,500 residents, 58% people of color
- Wastewater functions for 580,000 residents

NEAR-TERM FLOOD RISK IN ISLAIS CREEK / BAYVIEW

U.S. Army Corps of Engineers Flood Resiliency Study

Assets with current and near-term flood risk include:

- Heron's Head Park
- Recology
- Industrial and Maritime Uses and Jobs
- Pier 94 wetlands

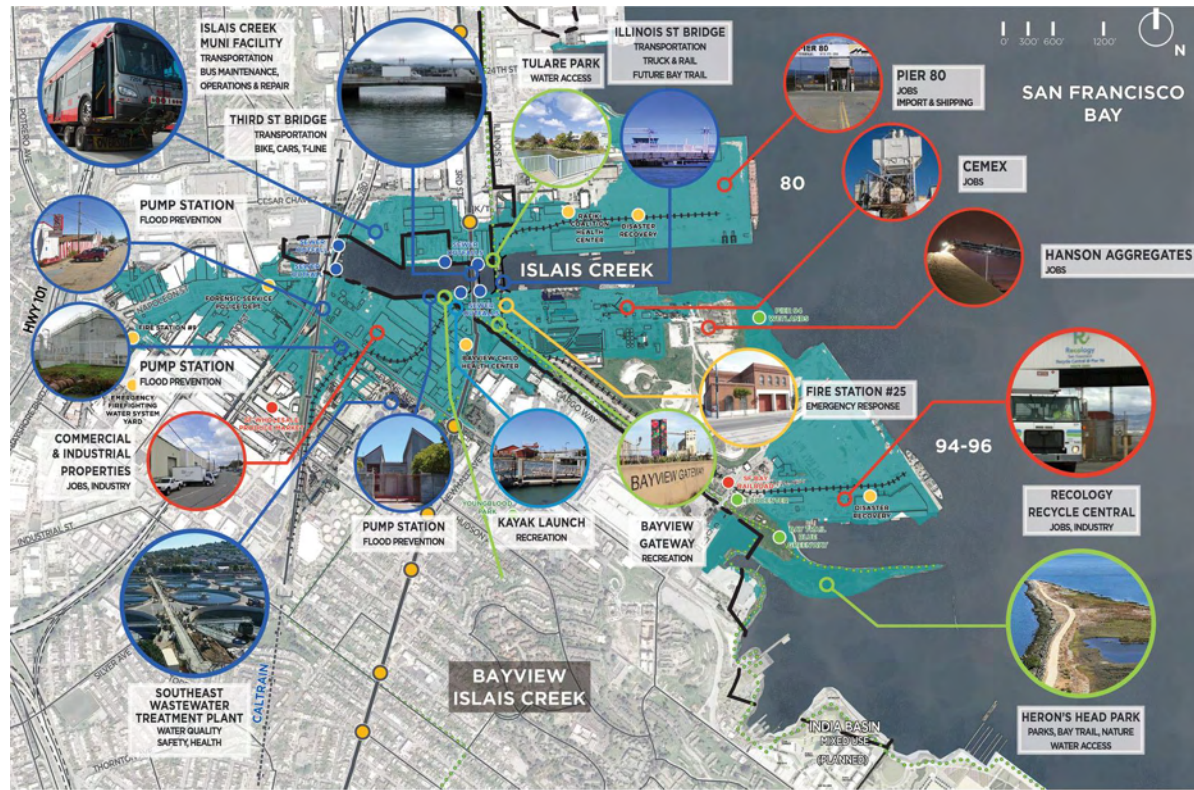


MID- TO LONG-TERM FLOOD RISK IN ISLAIS CREEK / BAYVIEW

U.S. Army Corps of Engineers Flood Resiliency Study

Mid- to long-term flood risk includes:

- Third Street and Illinois Street Bridges
- MUNI facilities that provide Citywide transit
- Industrial and Maritime uses and jobs
- Parks and open spaces
- Fire Station #25



100 years flood event + 3' SLR

FEEDBACK FROM “ASSET MAPPING” EXERCISE

Islais Creek / Bayview Feedback



- Bayview Opera House
- Candlestick Point
- Neighborhoods
- Parks and Open Space
- Heron’s Head
- Water Access
- Families and Communities
- Schools
- Community Based Organizations



- Housing
- Wastewater/ Sewage
- Third Street Bridge
- Transportation and Utilities
- Critical Facilities
- Jobs and Workforce Development
- Commercial Corridors and Local Industry



- Emergency Response
- Transportation
- Hospital Access
- Neighborhood Function
- Water Quality
- Contaminated lands
- Bayview/Hunters Point

What people love about the waterfront

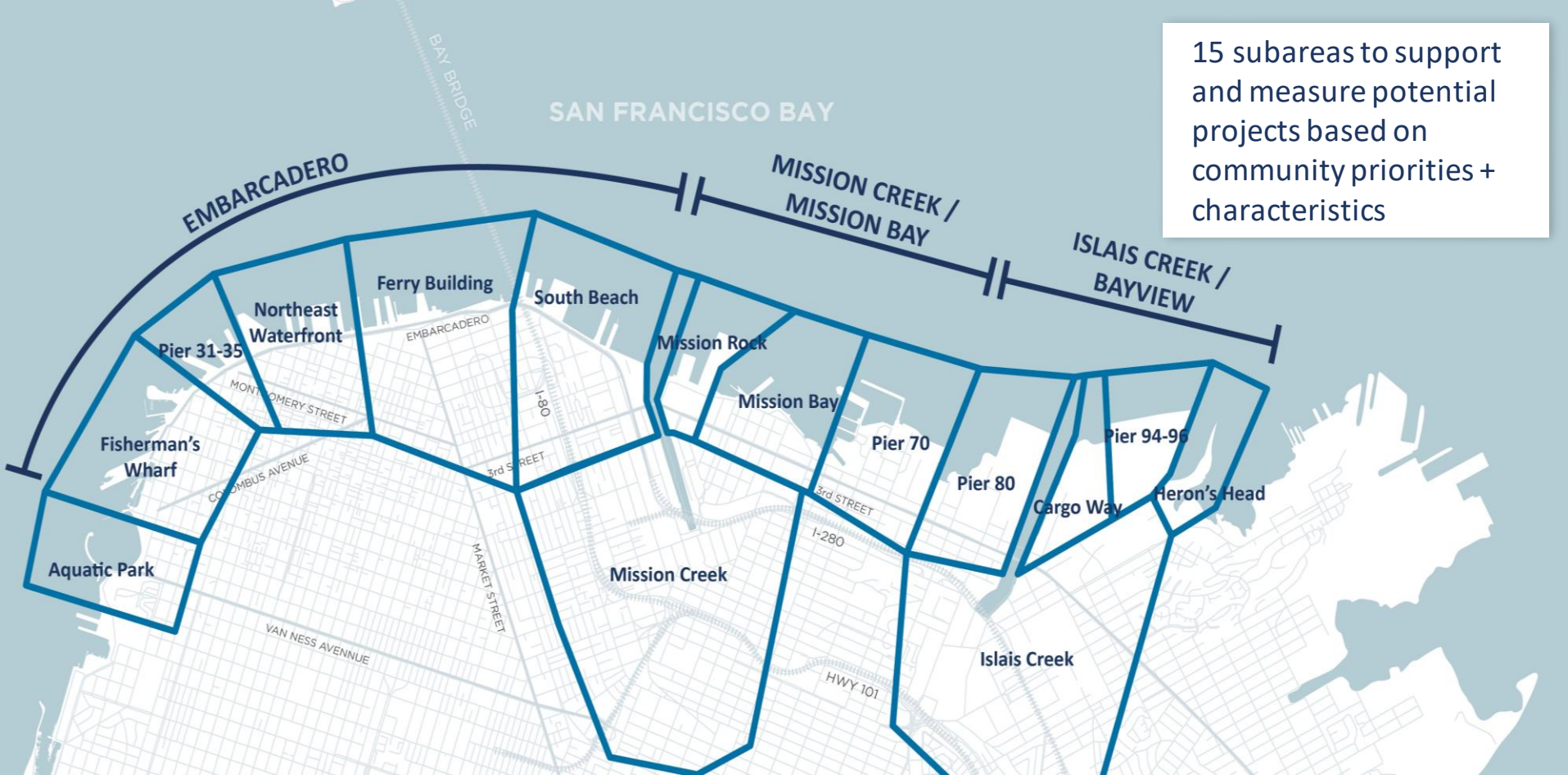
Assets important to the City

Concerns during a disaster

How Can We Reduce the Risk?

Waterfront "measures" to reduce risk

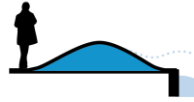
U.S. ARMY CORPS OF ENGINEERS FLOOD RESILIENCY STUDY AREA



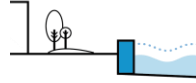
HOW CAN WE REDUCE FLOOD RISK?

Measures to Reduce Flood Risk

Physical
and Policy



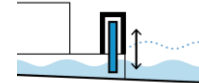
Levees



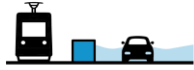
Seawalls



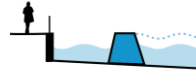
Raised Marine
Structures



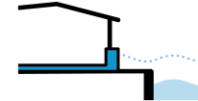
Tide Gates



Floodwalls



Breakwaters



Building
Adaptations



Deployables

Ecological



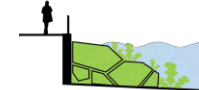
Ecological Marine
Structures



Ecological
Features



Aquatic
Habitat



Ecological
Shorelines

HOW WILL WE DECIDE HOW TO REDUCE THE RISK?

For Each of the 15 Subareas We Have Identified:

Measure Profile
Vegetated Revetment
Flood Adaptation Measure



ECOLOGICAL INFRASTRUCTURE



WATER LEVEL RANGE:
meets to surpasses

SHORELINE LOCATION:
Shoreline

DESIGN LIFE	ADAPTABILITY	IMPACT
Decades	Medium	Low

COASTAL FLOOD HAZARDS MITIGATED:
Enhancements can provide flood protection when:
Sea Level Rise
Storm Surge

MEASURES COMPATIBILITY:

Flood	Seismic	ECOS
Seawall, Levee	Nearshore Buttriss, Landslide, Buttriss, Liquefaction Mitigation	Ats

DESCRIPTION:
Plantings can be added to the voids between a new or existing revetment to create riparian and fish habitat. Plants can slow flow and protect coastal shorelines and river bars. Riparian revegetation can also protect coastal shorelines and river bars from erosion in low wave and/or weak flow locations.

CONSIDERATIONS:

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> Design should anticipate migration pathways or repositioning as sea levels rise. 	<ul style="list-style-type: none"> Ech Can hab

Measure Profile
Super Bulkhead Wharf
Seismic Adaptation Measure



SHORELINE STABILIZATION



TYPE: Structural

SHORELINE LOCATION:
Nearshore



Example of piles installed to support new wharf structure ©JGH

DESIGN LIFE	ADAPTABILITY	IMPACT ON THE WATERFRONT	CONSTRUCTION COST
75+ years	Medium	Moderate Waterside Intervention	High

SEISMIC HAZARDS MITIGATED:
Lateral Spreading, Liquefaction

SEISMIC PERFORMANCE IMPROVED:
Structures, Utilities and Transportation

MEASURES COMPATIBILITY:

Flood	Seismic
Raised Marine Structures	Liquefaction Mitigation Utility Retrofit

DESCRIPTION:
New robust wharf structure that would replace the existing bulkhead wall & wharf and be strong and stiff enough to stabilize the rock pile. This will reduce lateral spreading ground displacements to The Embarcadero, but will not stop liquefaction of the Embarcadero fill.

CONSIDERATIONS:

ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> The quantity and diameter of the piles would be defined by the depth of the Young Bay Mud and bedrock which varies along the waterfront. Measure is less effective in areas of medium to deep Young Bay Mud. Less construction impact to the Embarcadero and Promenade compared to landside shoreline stabilization measures. Replace deteriorated wharf structures. Can include wharf for future sea level rise protection. 	<ul style="list-style-type: none"> Construction would require closure of waterfront buildings and relocation of berths when the work occurs at an occupied pier. Construction duration likely longer than other shoreline stabilization measures. Does not mitigate liquefaction-induced settlements.

Waterfront Resilience Program | Measure Profile | Page 1

- Community, City, and Port priorities and characteristics
- Critical assets and facilities
- Shoreline conditions and character
- Feasible ways to reduce seismic and current and future flood risk

HOW WILL WE DECIDE HOW TO REDUCE THE RISK?

Focused Array Themes

ECOLOGICAL ASSETS AND SERVICES



HISTORICAL AND CULTURAL



SEISMIC DISASTER RESPONSE



TRANSPORTATION MOBILITY
INFRASTRUCTURE



COMMUNITY COHESIVENESS



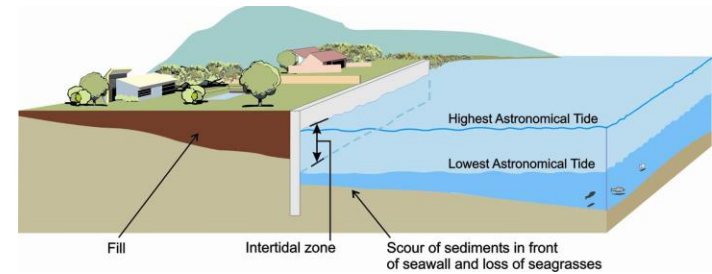
NON STRUCTURAL



HOW WILL WE REDUCE THE RISK?

Process for Developing Alternatives and Strategies

- Build upon community, City and Port priorities
- Understand existing and future conditions and characteristics
- Use repetition or multiple iterations to test out measures and strategies and obtain input
- Understand the above by ensuring everyone is at the table





Stakeholder Engagement

What We've Heard from Islais Creek / Bayview



FEEDBACK ON GEOGRAPHIC PROGRAM GOALS

Islais Creek / Bayview Feedback

PARTICIPANT'S HANDOUT
TABLE NUMBER:

SOUTHERN WATERFRONT DRAFT GOALS

WELCOME!
Islais Creek Adaptation Strategy
Waterfront Resilience Program,
Southern Waterfront
Workshop #2, Tuesday January 30th
8:00 Community Facility

OVERALL PROJECT GOAL:
A VISION FOR ISLAIS CREEK THAT ADAPTS TO FLOOD RISKS WHILE ENSURING HEALTHY AND RESILIENT COMMUNITIES

- Encourage neighborhood vitality, character, and diversity with more mixed-income housing
- Adapt buildings, open spaces and services that ensure the safety and preparedness of the district and city in the case of a flood emergency
- Develop equitable solutions with and for a wide variety of community members, including youth, seniors, families and people of color
- Build a long-lasting basis of support with a transparent, authentic engagement process
- Engage with youth to build long-term understanding, capacity, and stewardship
- Acknowledge the significance of the nearby designated African American Cultural District of Bayview Hunters Point, and other cultural groups, as central to developing future visions
- Engage with youth to build long-term understanding, capacity, and stewardship

COMMUNITY & SOCIAL RESILIENCE
A SOCIALLY AND ENVIRONMENTALLY RESILIENT NEIGHBORHOOD

TRANSPORTATION
AUTHENTIC AND TRANSPARENT PUBLIC ENGAGEMENT DURING AND BEYOND THE PLANNING PHASE

TRANSPORTATION
A TRANSPORTATION SYSTEM THAT IS RESILIENT AND ADAPTABLE TO FLOOD RISK

- Adapt key transportation facilities to flooding to maintain operations, service and connectivity
- Improve connectivity between Bayview and other neighborhoods
- Improve pedestrian and bike connections to provide resilience during near term periods, flood events
- Create accessible transportation between the waterfront, the City and the region

ENVIRONMENT
A HEALTHY ENVIRONMENT FOR RESIDENTS, WORKERS, AND ECOLOGIES

- Identify solutions and strategies that benefit the entire Islais Creek watershed
- Prioritize nature-based solutions and green infrastructure to mitigate floods, improve stormwater management and support local ecology
- Improve access to and create new resilient open spaces along the creek and bay shorelines to provide much needed recreational space for the surrounding neighborhoods

ECONOMY
A SUSTAINABLE ECONOMY THAT BENEFITS LOCAL RESIDENTS, WORKERS, AND INDUSTRIES

- Adapt flood-prone areas that currently support existing jobs, small businesses and local artists
- Support local, blue collar industrial jobs
- Use the planning process of this project as an opportunity to train and mentor individuals in the fields of design, planning and engineering
- Maintain and increase of women- and minority-owned businesses, community benefit organizations, worship centers, and arts and culture organizations



STRENGTHEN
10 FT OF SEA LEVEL RISE NOW - 2050

ADAPT
7 FT OF SEA LEVEL RISE 2050 - 2100

ENVISION
5 FT OF SEA LEVEL RISE 2100 - 2140

WHICH OBJECTIVES DO WE PRIORITIZE IN EACH PHASE?
HOW DO WE BALANCE ALL THE GOALS OVER TIME?

TABLE NUMBER:

- Prioritize homes, including low-income housing
- Prioritize environmental concerns
- Ensure anti-displacement is centered in any work
- Broad support for the Embarcadero Seawall Program as addressing risk is important to the entire City, including the Bayview
- That said, prioritize resilience projects in the Southern waterfront
- Continue engagement along the Port's entire 7.5 mile jurisdiction

HOW THIS ENGAGEMENT EFFORT INFORMED THE WRP

Community Input Helped Refine WRP

1

Community feedback affirmed focus on **life safety & emergency response** and offered ideas for evolving how we understand “inspiring an adaptable waterfront”:

- Connecting
- Accessible
- Supporting jobs, housing, seniors & youth

2

Community feedback affirmed the Port goals and encouraged:

- Transparency
- Accountability
- Engagement
- **Prioritize assets most loved by the community and most important to the city**
- Select projects that responsibly use tax dollars

3

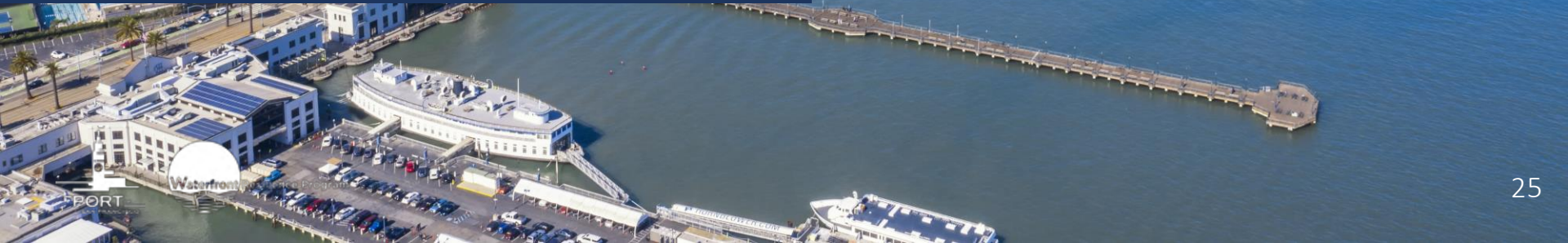
Community feedback on evaluation criteria affirmed the Port’s key focus on life safety and disaster response

- **“Put people first”**
- Assets and services most prioritized: housing, disaster recovery facilities, utilities, and businesses
- Key focus on transportation assets



Next Steps

What's Next for the Waterfront Resilience Program?



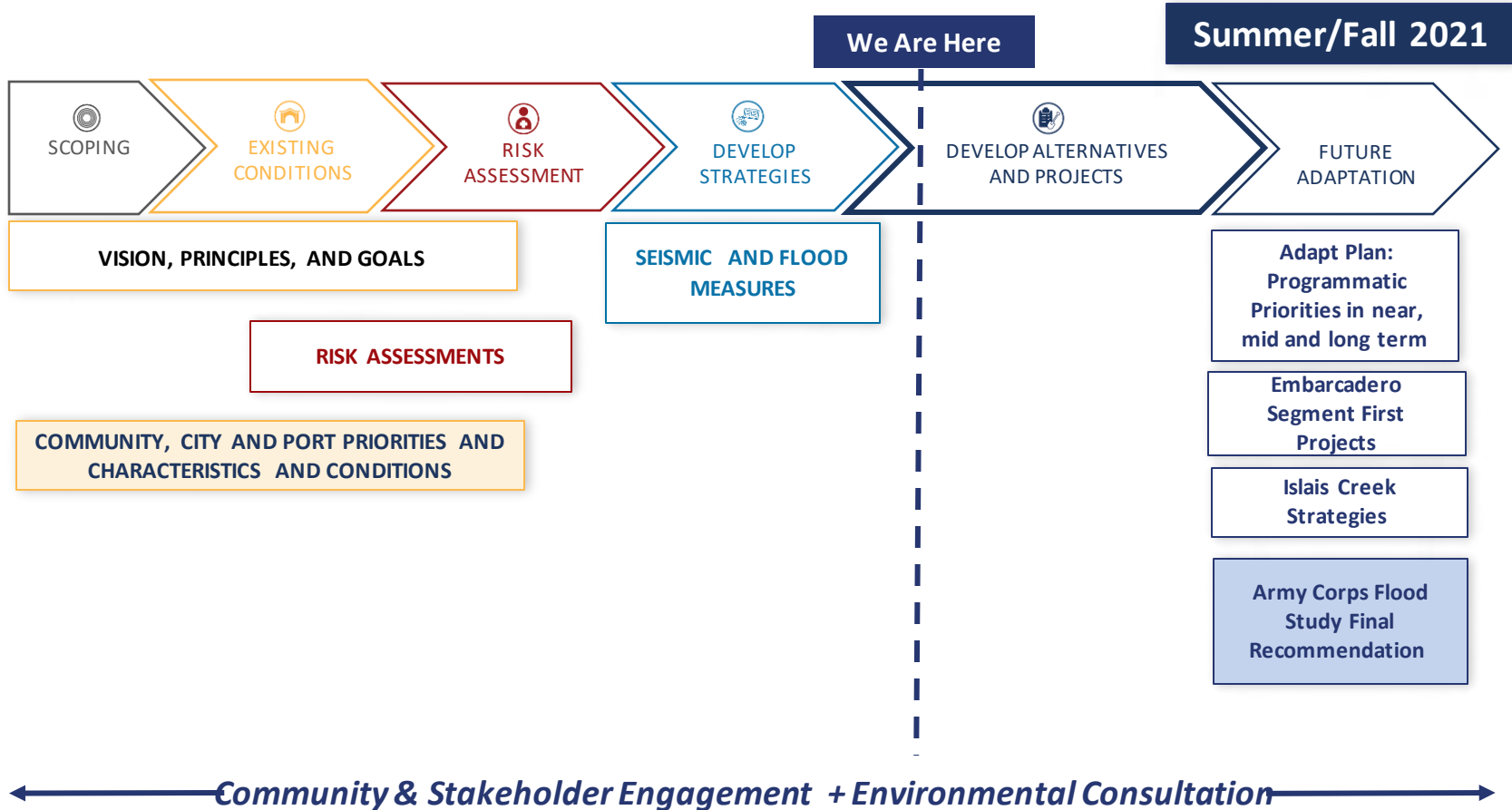
EMBARCADERO SEAWALL PROGRAM

Program Overview



- **Project Area:** Fisherman's Wharf to Mission Creek
- **Timing:** 2017 to 2021 project planning followed by implementation / construction
- **Focus:** Seismic and flood risk associated with the Embarcadero Seawall
- **Funding:** \$425 million General Obligation Bond passed in November 2018

WATERFRONT RESILIENCE PROGRAM STEPS



JOB AND CAREER OPPORTUNITIES

Coming Soon...



Job Opportunities May Include:

- Pile Drivers
- Welders
- Laborers
- Cement Masons
- Operating Engineers
- Carpenters
- Painters
- Office Engineers
- Schedulers and Document Controls
- Construction Administrative

SMALL & LOCAL BUSINESS CONTRACT OPPORTUNITIES

Coming Soon...



Upcoming Contracts May Include:

Professional Services:

- Engineering
- Design
- Environmental
- Planning

Construction

- Demolition
- Excavation
- Pavement and sidewalk removal
- Electrical

UPCOMING COMMUNITY ENGAGEMENT

Join Us for Virtual Office Hours



Wednesday, February 24, 5:00-6:00 PM

UPCOMING COMMUNITY ENGAGEMENT

Engagement Planned for Early 2021



- Meetings co-hosted with community-based organizations in Islais Creek / Bayview and Mission Creek / Mission Bay
- Ongoing digital engagement, including feedback on waterfront-wide measures and Waterfront Resilience Story Maps
- Ongoing tenant engagement
- Youth engagement with youth-serving organizations that serve citywide youth

FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Physical Measures Applied to the Southern Waterfront

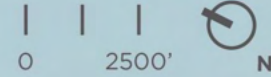


Mission Bay identified measures include:

- Levee with banks to reduce erosion
- Raised pathway / Raised features
- Native, Vegetated Terraces

Piers 80/94/96 identified measures include:

- Raised features
- Raised wharves
- Ecological improvements

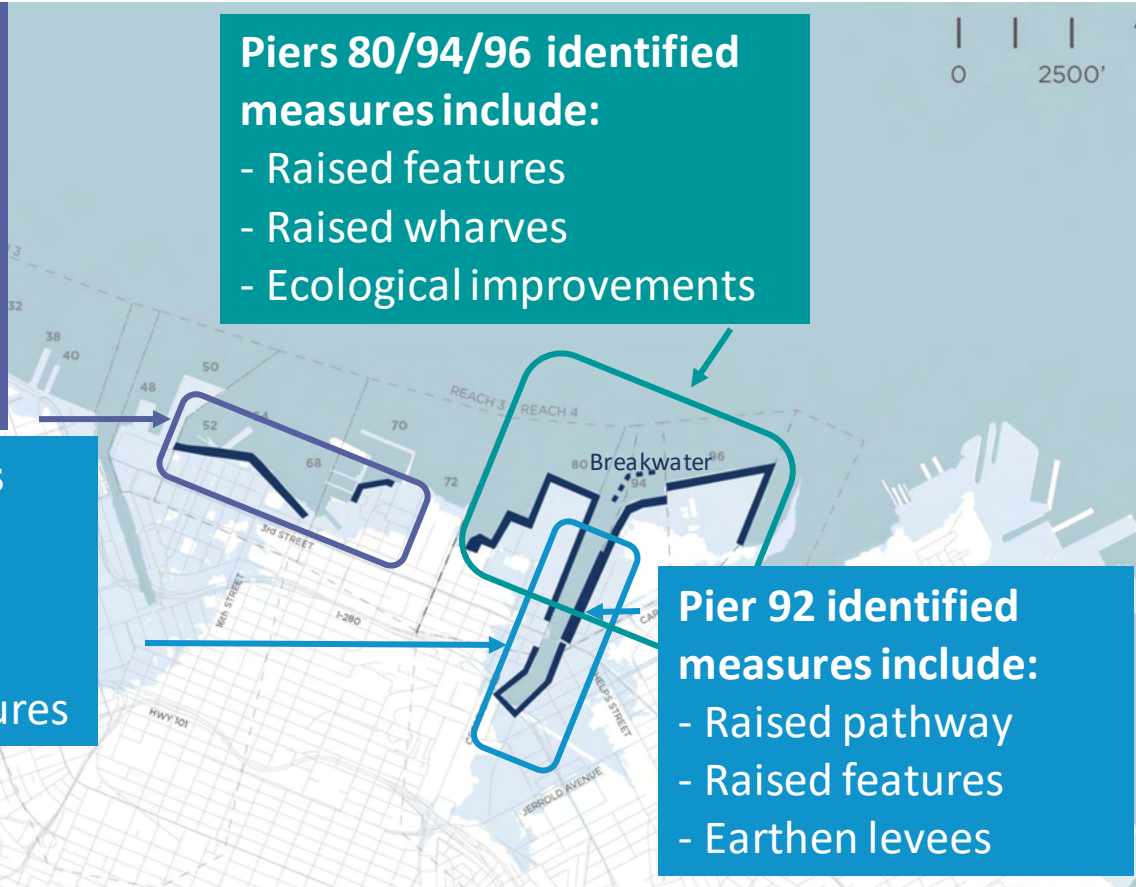


Islais Creek identified measures include:

- Tidal gates and barriers
- Raised bridges
- Raised pathways / Raised features

Pier 92 identified measures include:

- Raised pathway
- Raised features
- Earthen levees



INLAND STRUCTURAL MEASURES
BREAKWATERS - EVALUATION IN FUTURE DESIGN PHASES

FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Non-Structural Measures Applied to the Southern Waterfront

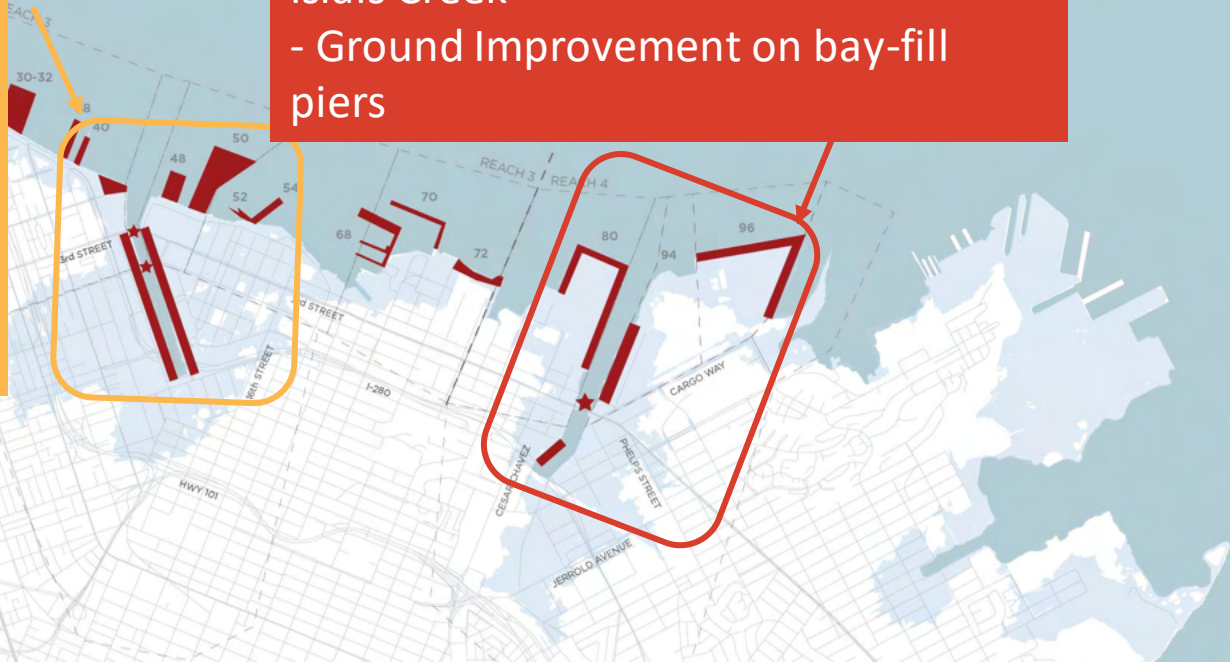
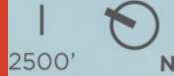


Mission Creek and Pier 80 policy considerations:

- Structures elevation (Park in front of Oracle Park + Bridges across the creek)
- Dry floodproofing (Ground floors around Mission Creek + industrial buildings on Pier 80)
- Ground Improvement on bay-fill piers

Islais Creek policy considerations:

- Elevate Bridges across the creek
- Dry floodproofing Buildings around Islais Creek
- Ground Improvement on bay-fill piers



 POLICY CONSIDERATION, INCLUDING STRUCTURE RELOCATION AND REMOVAL

 Raised Bridges

FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Nature Based Measures Applied to the Southern Waterfront



Central Waterfront:

- Combination of beaches and vegetated banks bayward at Bayfront Park and Pier 70

Piers 80/94/96:

- Stepped slopes and vegetated banks softening the edges at Warm Water Cove, Pier 94 wetlands and Heron's Head.
- Room for the creek and softening the edges of the creek

Islais Creek:

- Stepped slopes reshaping the geography of Islais Creek



A photograph of two children riding bicycles on a dirt path. The child in the foreground is wearing a red and white jersey and a yellow helmet. The child in the background is wearing a dark jersey with the number 30 and a dark helmet. In the background, a large ship is visible in a harbor under a clear blue sky.

Thank You!

Brad Benson, Port of San Francisco
brad.benson@sfport.com

