Waterfront Resilience Program Updates

Friends of Esprit Park

February 2, 2021

PORT OF SAN FRANCISCO

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

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WATERFRONT RESILIENCE PROGRAM DRAFT PRINCIPLES CONTINUED

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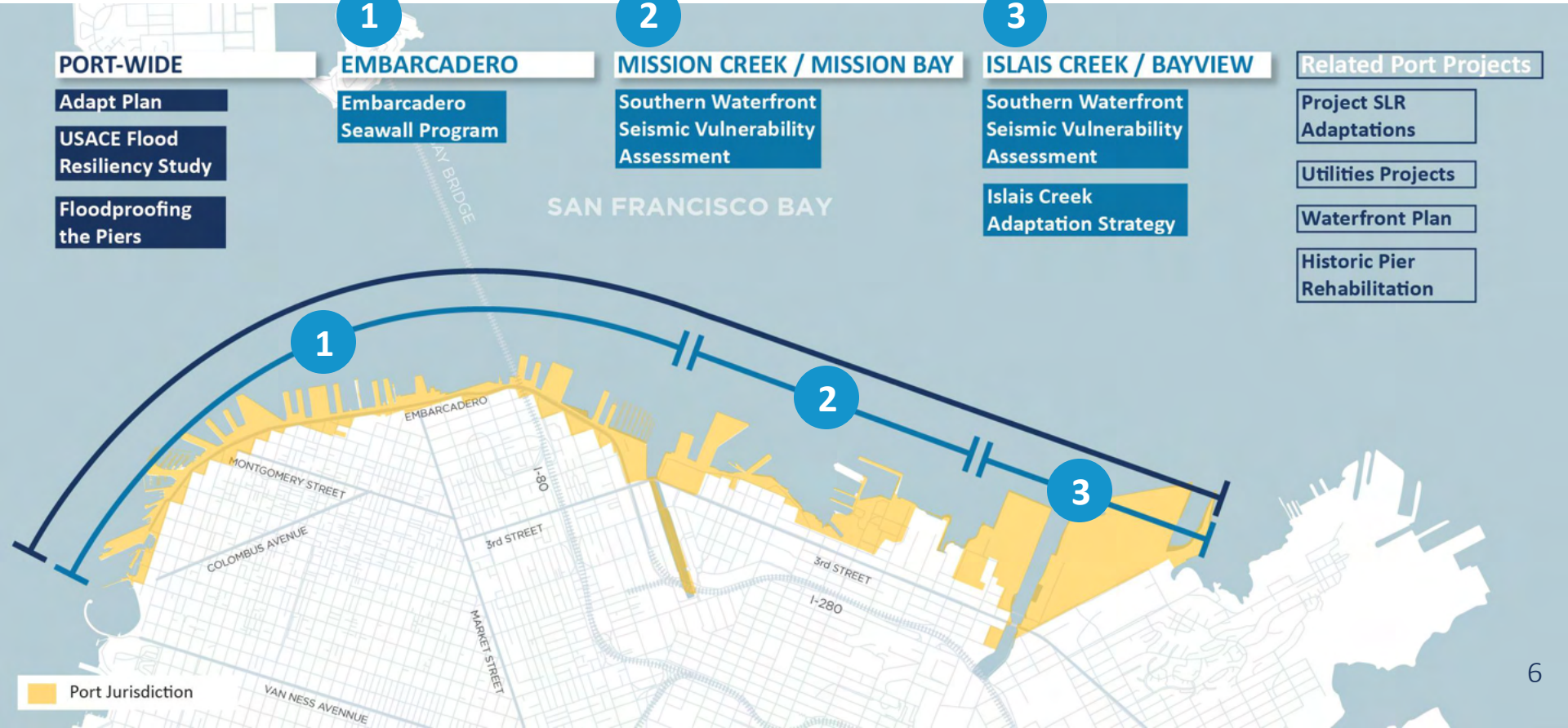
- **Inspire** an adaptable waterfront that:
  - Improves the health of the Bay
  - Ensures public access to the waterfront and historic places and an inviting waterfront for all
  - Protects and preserves historic and maritime resources
  - Provides opportunities for diverse families, businesses, and 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

Waterfront Resilience Program (Flood Study & Seawall)

Strengthen Adapt Envision

Waterfront Plan Update

Hazard & Climate Resilience Plan

Climate Action Strategy

Islais Creek Adaptation Strategy

CR General Plan Updates

Ocean Beach Adaptation

Bayview Resilience Strategy

Flood Risk in Mission Creek / Mission Bay

Overview of Projects and What Is at Risk

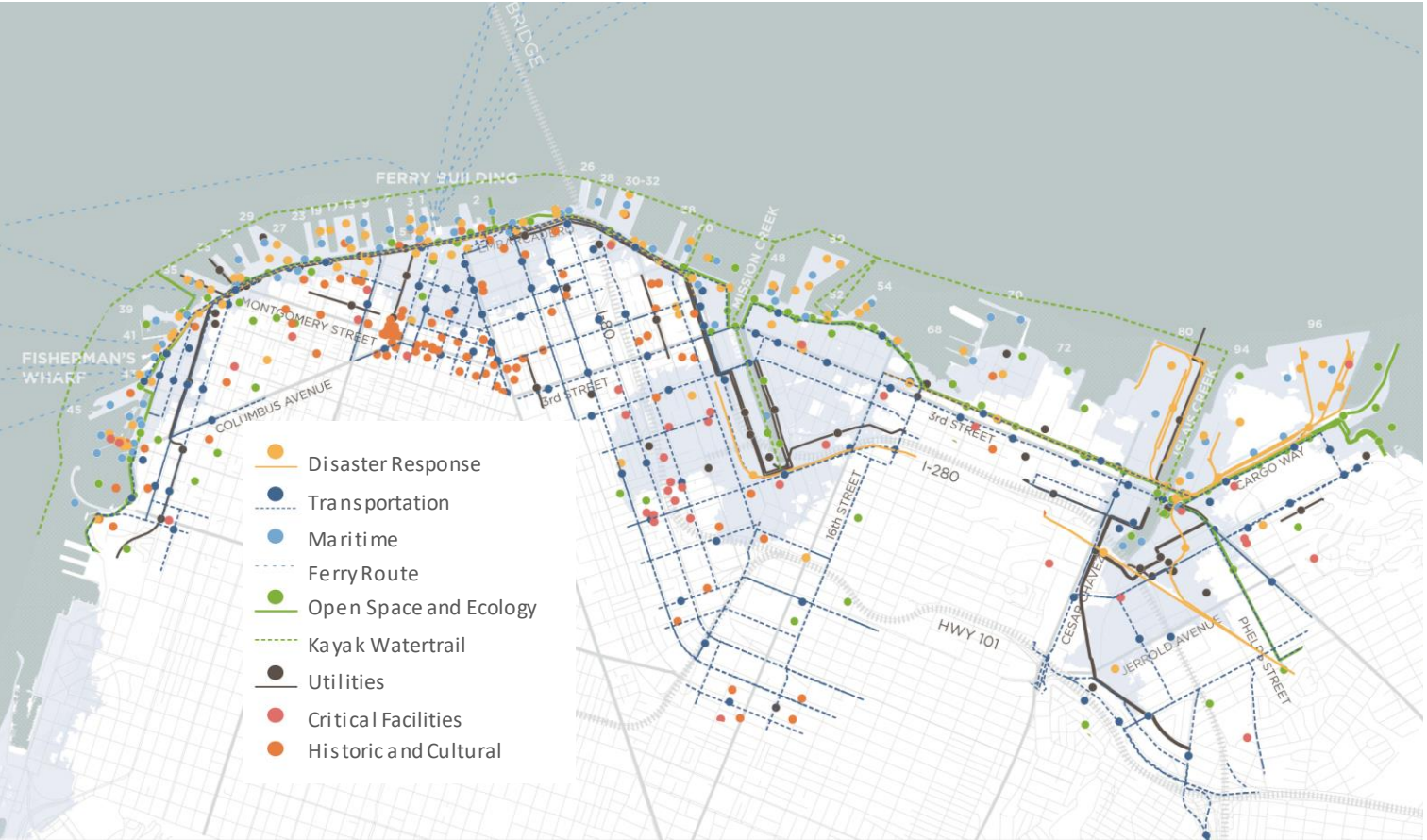
U.S. ARMY CORPS OF ENGINEERS (USACE) FLOOD RESILIENCY STUDY

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 stakeh older input
- If the Federal government partners with the Port on a project, they will contribute 65% of its cost

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 MISSION CREEK / MISSION BAY

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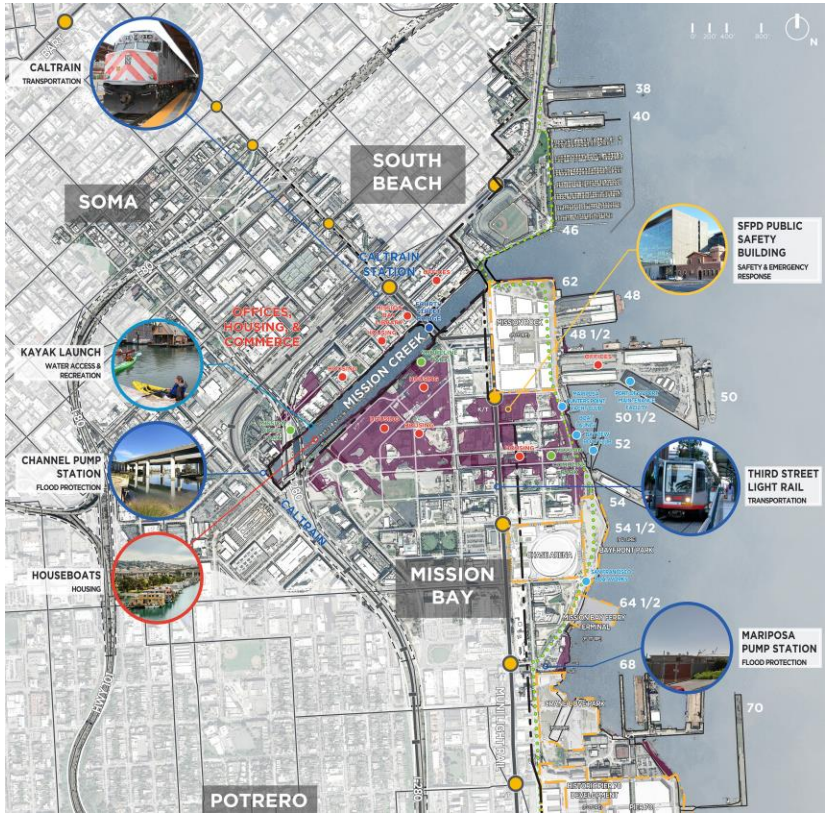

100 years flood event

MID- TO LONG-TERM FLOOD RISK IN MISSION CREEK / MISSION BAY

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Mid- to long-term flood risk includes:

- Third Street Bridge
- San Francisco Giants Ballpark
- UCSF Mission Bay
- Pier 70

100 years flood event + 3' SLR

FEEDBACK FROM "ASSET MAPPING" EXERCISE

Mission Creek / Mission Bay Feedback

- Waterfront and Views
- Habitat
- Ballpark
- Commercial Districts
- Maritime
- Transportation
- Housing and Multi-Use Developments

- Mission Bay Hospital (UCSF)
- Utilities and Treatment Systems
- Maritime
- Transit
- Evacuation and Emergency Response, including Police Facilities

- Mission Bay Hospital (UCSF)
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- Saltwater Inundation and Ecological Concerns
- Housing
- Evacuation/ Emergency Response

LET'S PAUSE FOR Q&A

We Want to Hear from You

- What assets are we missing for Mission Creek and Mission Bay?

SOUTHERN WATERFRONT SEISMIC VULNERABILITY ASSESSMENT

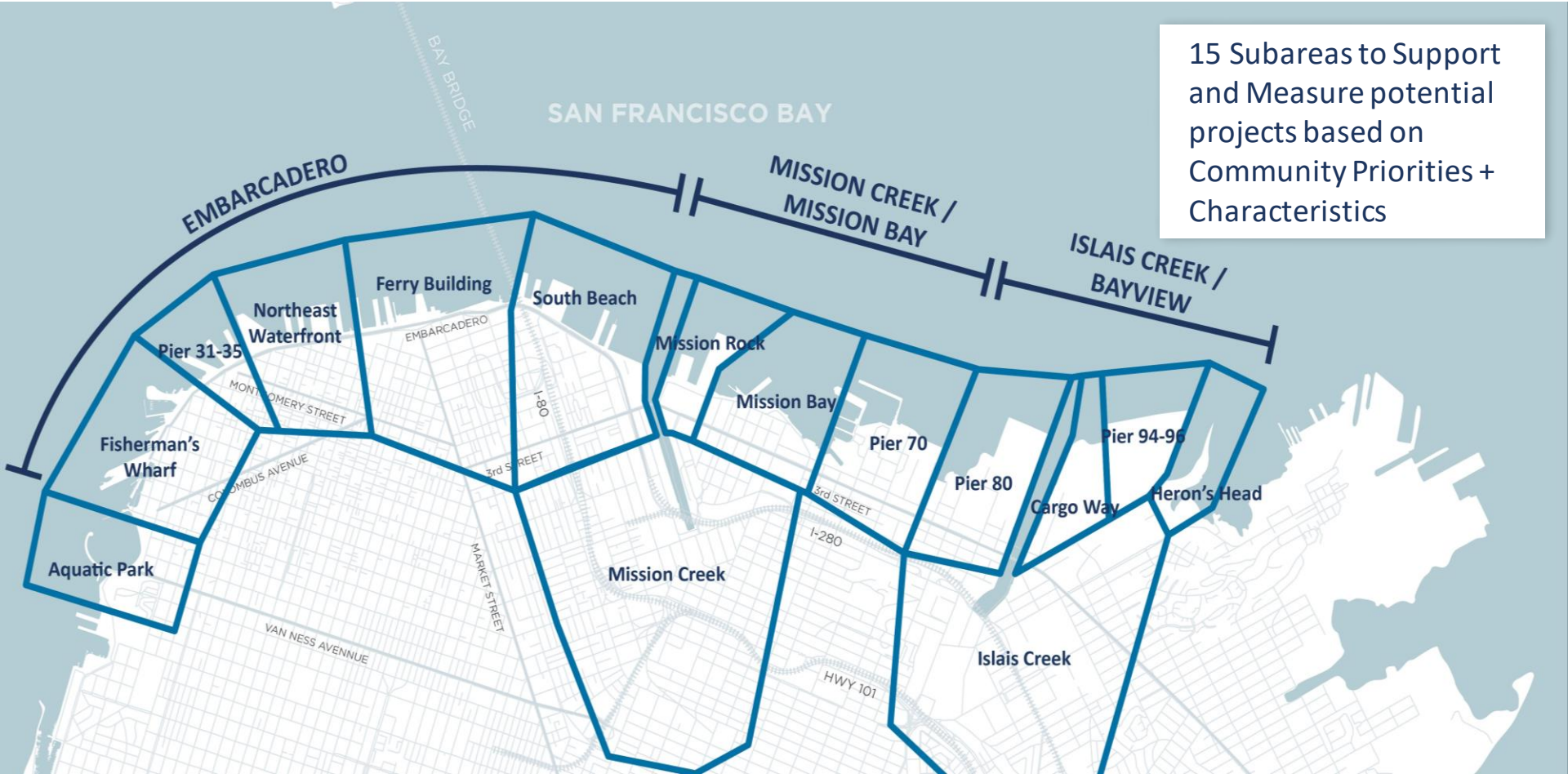
Overview and Key Highlights

- **Focus:** Earthquakes
- **Implementation:** Short, Medium, and Long-Term
- **Lead Agency:** Port of San Francisco

How Can We Reduce the Risk?

Waterfront "measures" to reduce risk

UNITED STATES ARMY CORPS OF ENGINEERS FLOOD STUDY AREA



LET'S TAKE A QUICK POLL

What Matter's Most to You?

- **Design Life and Risk Reduced** – How long a project will provide risk reduction before requiring replacement? How much of the risk is being reduced and for how long?

- **Cost** – How much will a project cost? How does this compare with the design life?

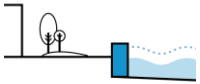
- **Multiple functions** – Does the project provide multiple benefits? Public open space and flood risk reduction? Transportation improvements and risk reduction?

HOW CAN WE REDUCE FLOOD RISK?

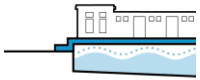
Measures to Reduce Flood

Physical and Policy

Levees



Seawalls



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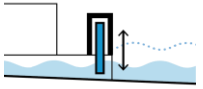
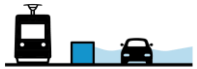


Tide Gates



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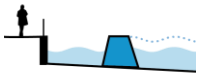

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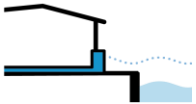
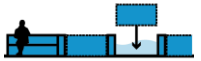


Building Adaptations



Deployables

Ecological

Ecological Marine Structures

Ecological Features

Aquatic Habitat

Ecological Shorelines

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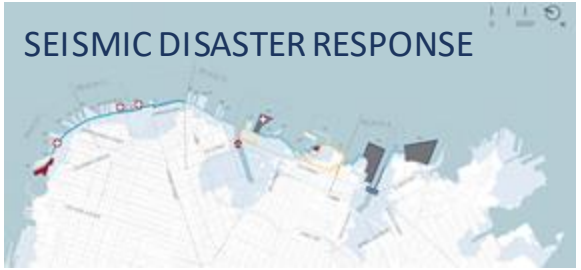
HOW WILL WE DECIDE HOW TO REDUCE THE RISK?

For Each of the 15 Subareas We Have Identified:

- 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?

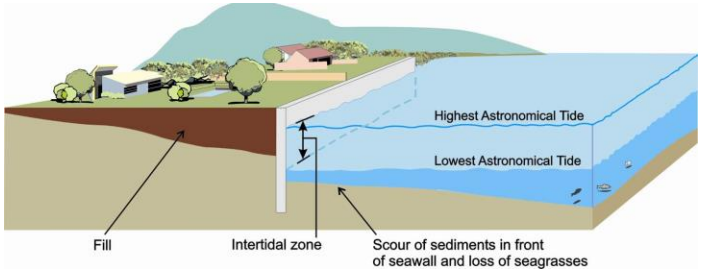
Focused Array Themes



HOW WILL WE DECIDE HOW TO 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

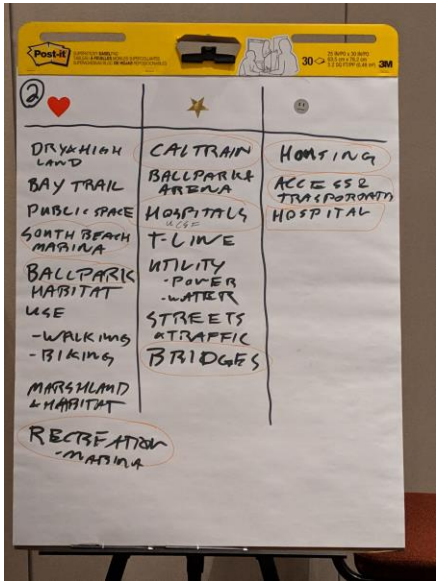


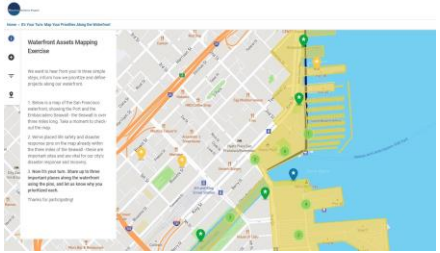
Stakeholder Engagement

What We've Heard from Mission Creek / Mission Bay

FEEDBACK ON GEOGRAPHIC PROGRAM GOALS

Mission Creek / Mission Bay Feedback





- Reached **27,000+ people** on Facebook and Twitter
- Received **125 survey responses**
- Maintaining and expanding **open spaces**
- Protecting **all housing types** (i.e. houseboats and apartments) and prioritizing low-income housing
- Not imposing costs of expensive adaptations on homeowners
- Prioritizing **safety** and preparedness of district
- Supporting small and locally owned businesses

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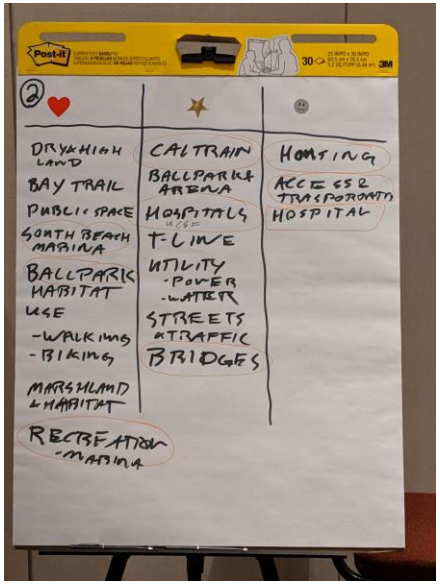
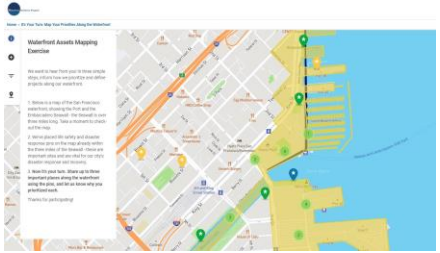
FEEDBACK ON GEOGRAPHIC PROGRAM GOALS CONT.

Mission Creek / Mission Bay Feedback





- Acknowledging, prioritizing, and protecting vulnerable populations to address **social equity**
- Adding specificity on how goals will be prioritized (i.e. preserving open spaces vs. adding homes)
- **Restoring the shoreline** with indigenous plants
- **Continuing engagement** along the Port's entire 7.5-mile jurisdiction, including reaching youth
- Including **accountability** as part of governance and coordination with City agencies

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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

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Next Steps

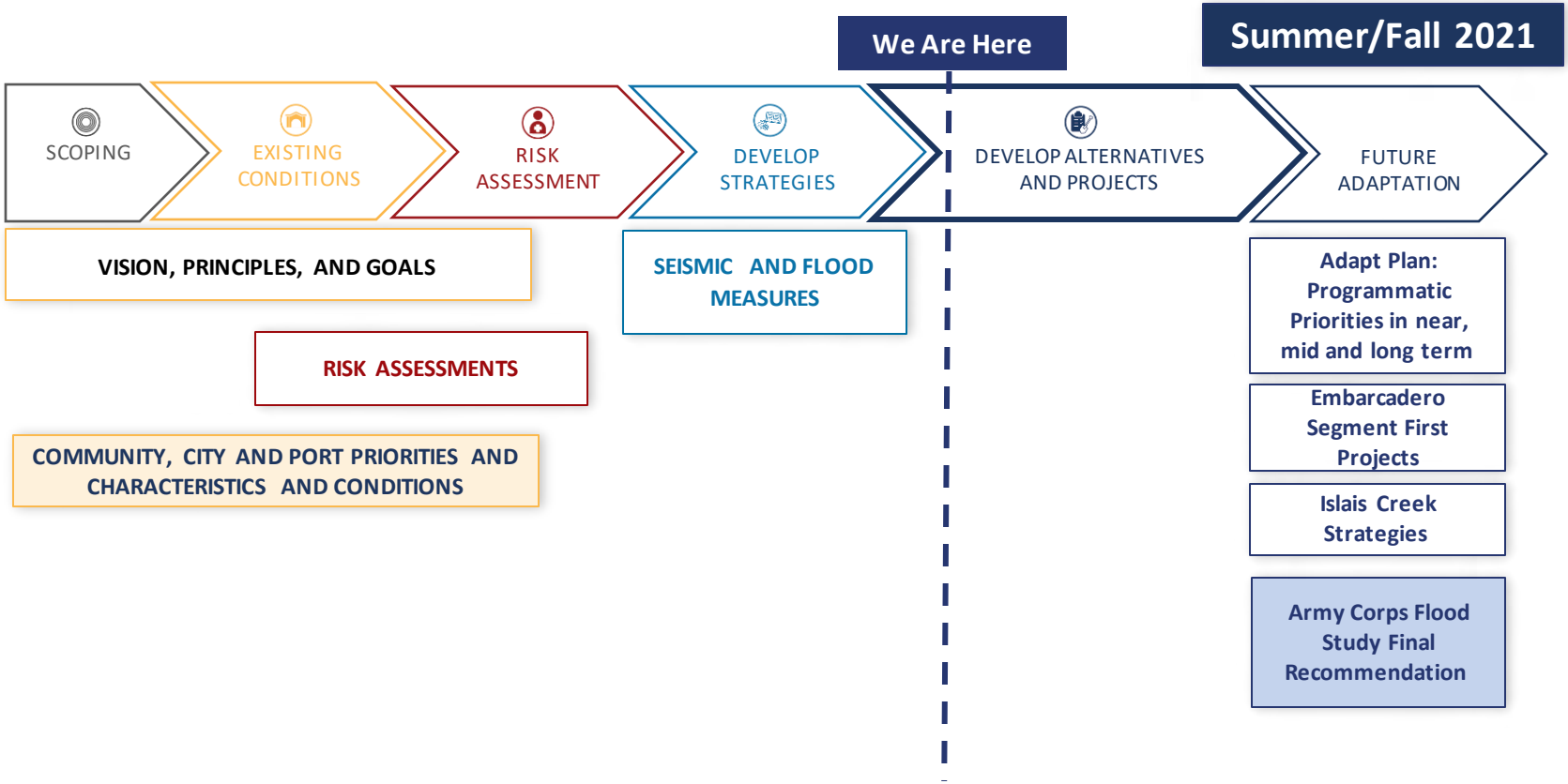
What's Next for the Waterfront Resilience Program?

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

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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

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

FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Physical Measures Applied to the Central Waterfront

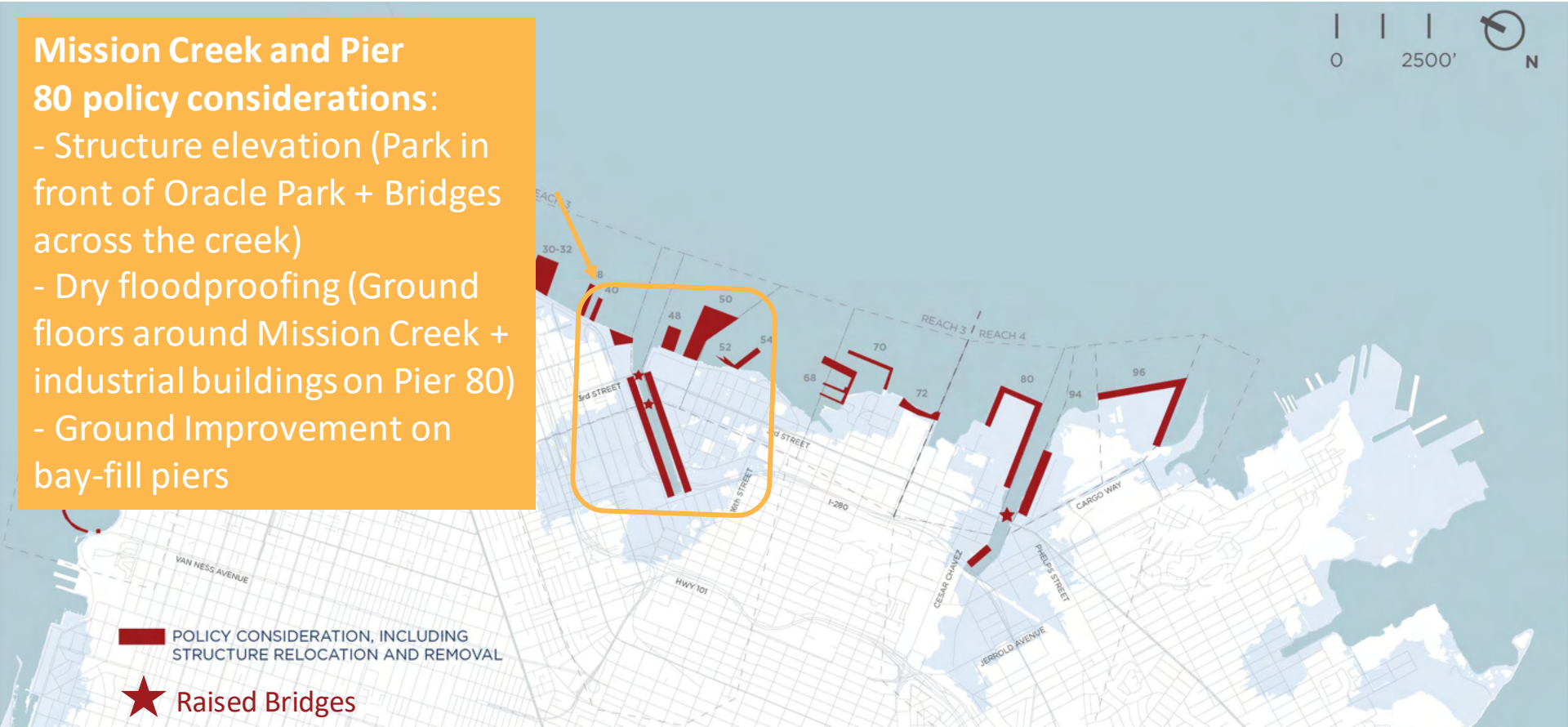
Mission Bay identified measures include:

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

FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Non-Structural Measures Applied to the Central Waterfront

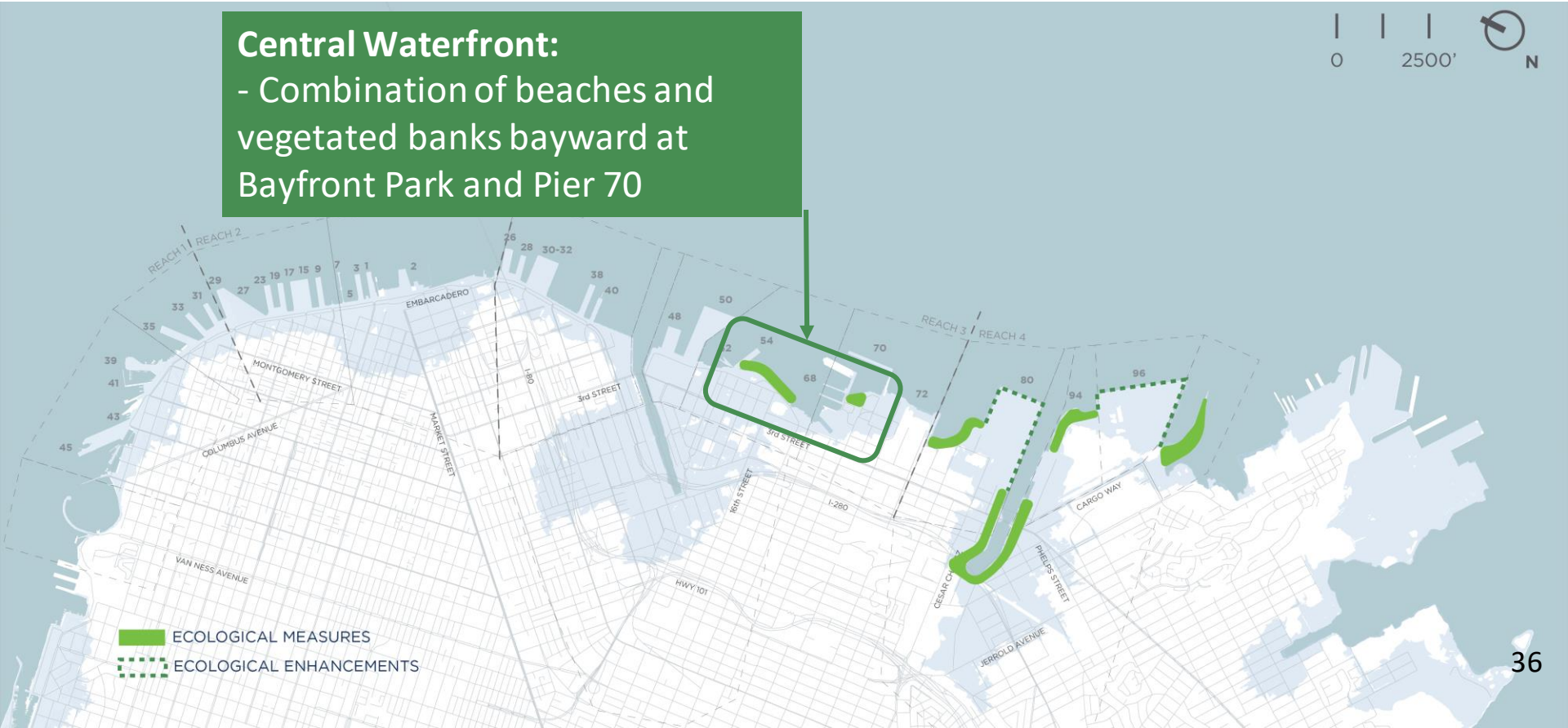
Mission Creek and Pier 80 policy considerations:
- Structure elevation (Park in front of Oracle Park + Bridges across the creek)
- Dry floodproofing (Ground floors around Mission Creek + industrial buildings on Pier 80)
- Ground Improvement on bay-fill piers



FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Nature Based Measures Applied to the Central Waterfront

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



Thank You!

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

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Mission Bay Citizens Advisory Committee

February 11, 2021

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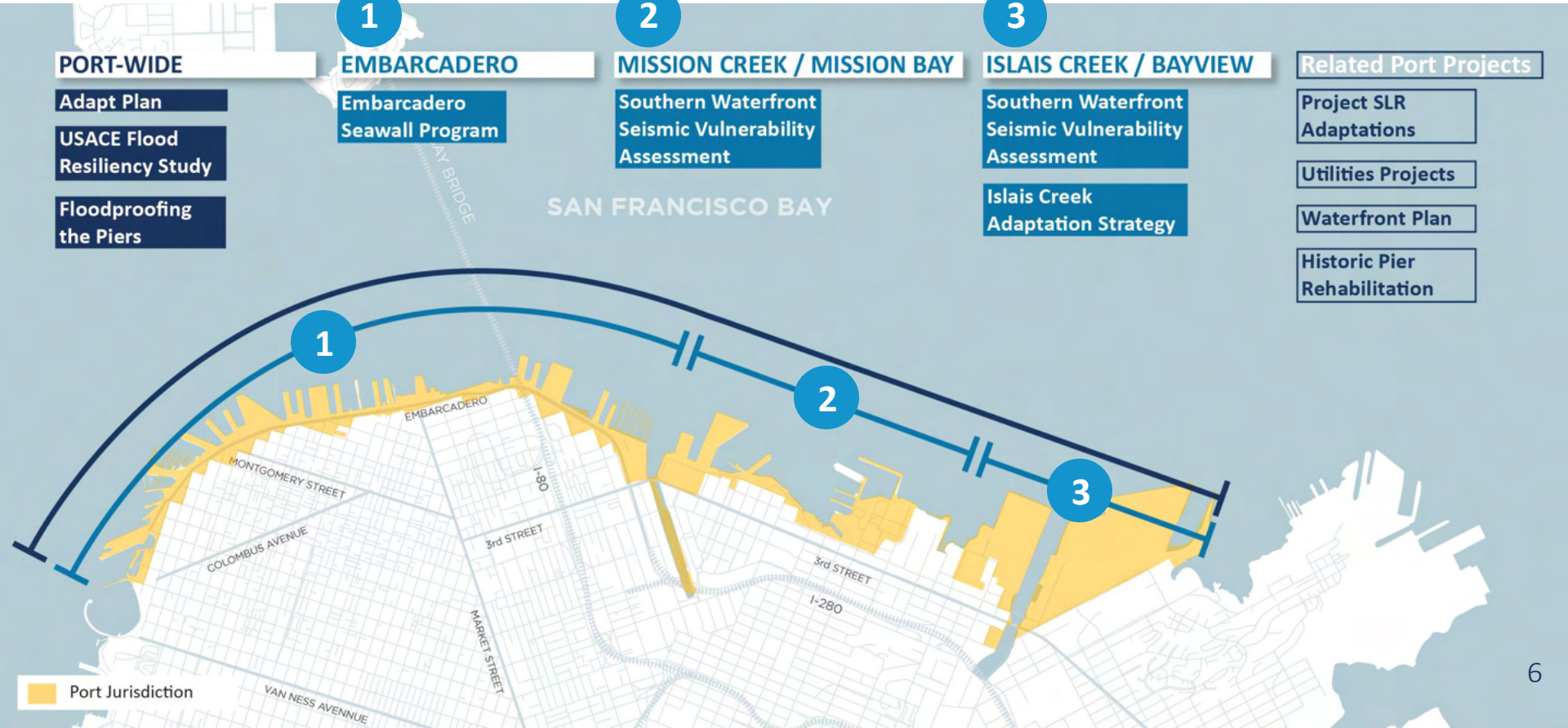

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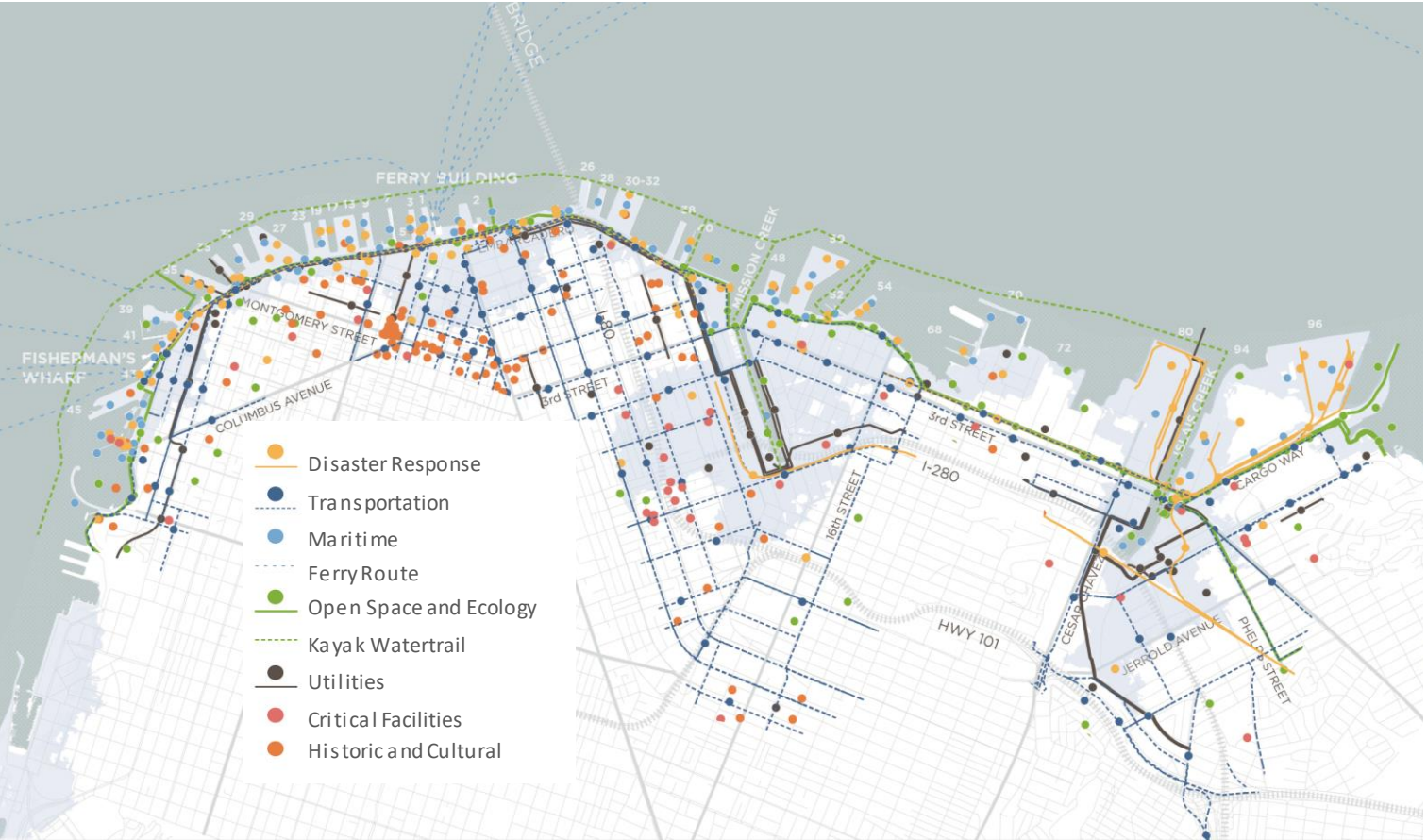

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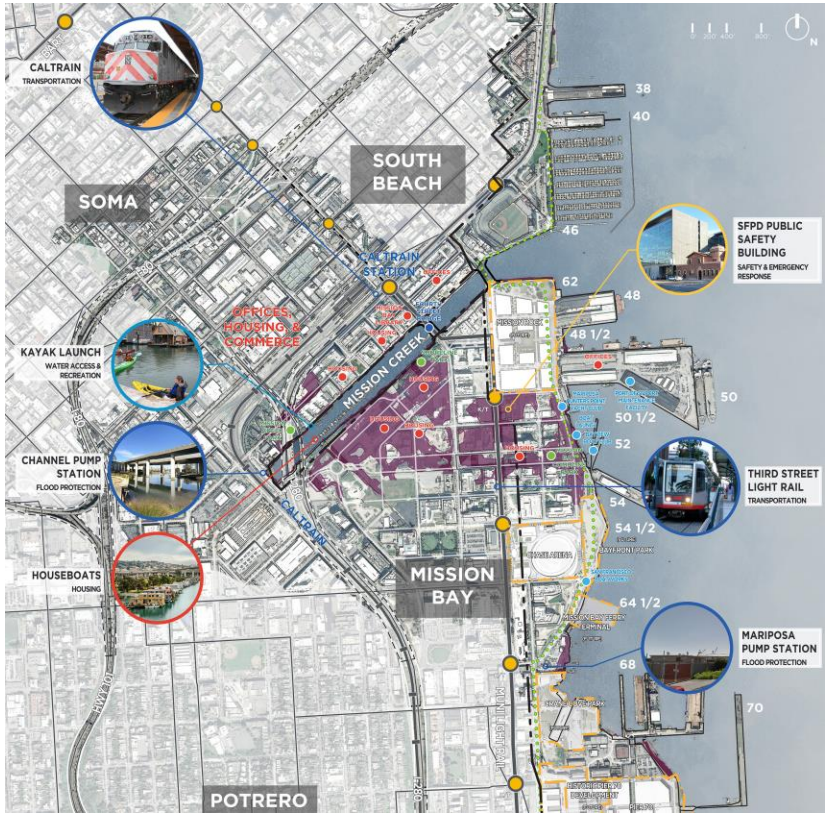

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Mission Creek / Mission Bay Feedback

- Waterfront and Views
- Habitat
- Ballpark
- Commercial Districts
- Maritime
- Transportation
- Housing and Multi-Use Developments

What people love about the waterfront

- Mission Bay Hospital (UCSF)
- Utilities and Treatment Systems
- Maritime
- Transit
- Evacuation and Emergency Response, including Police Facilities

Assets important to the City

- Mission Bay Hospital (UCSF)
- Transportation Network
- Utilities/Treatment Systems/Pump Station
- Saltwater Inundation and Ecological Concerns
- Housing
- Evacuation/ Emergency Response

Concerns during a disaster

SOUTHERN WATERFRONT SEISMIC VULNERABILITY ASSESSMENT

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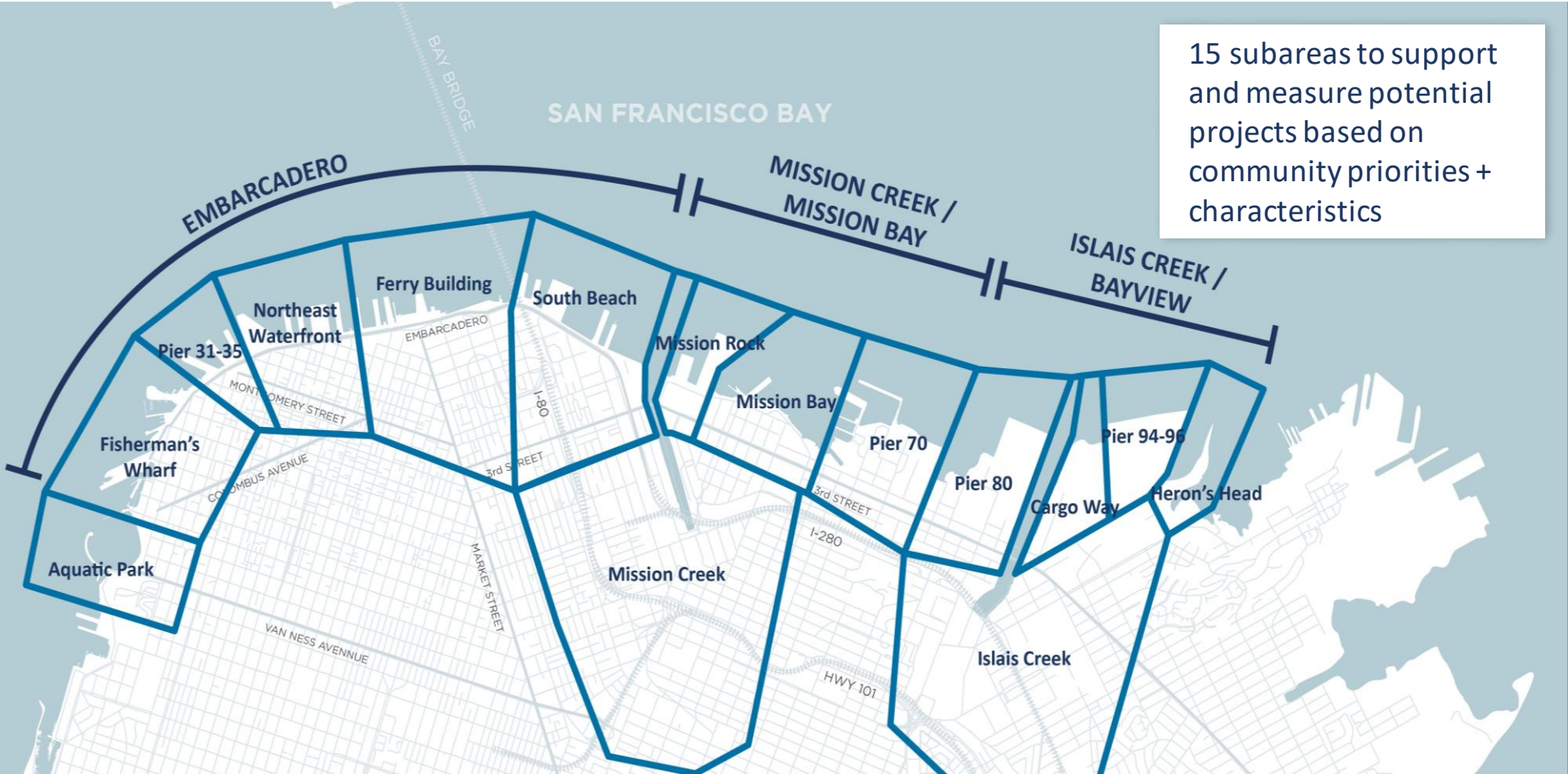
- **Focus:** All hazards, broad resilience (Equity, Environment, Economy)
- **Implementation:** Short, Medium, and Long-Term
- **Lead Agency:** Port of San Francisco

How Can We Reduce the Risk?

Waterfront "measures" to reduce risk

U.S ARMY CORPS OF ENGINEERS FLOOD RESILIENCY STUDY AREA



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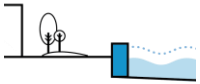
Measures to Reduce Flood

Physical and Policy

Levees



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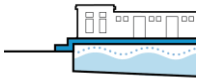

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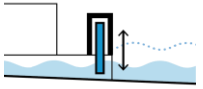

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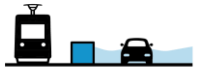

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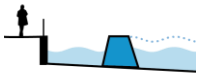

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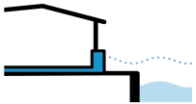

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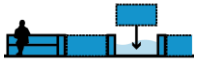

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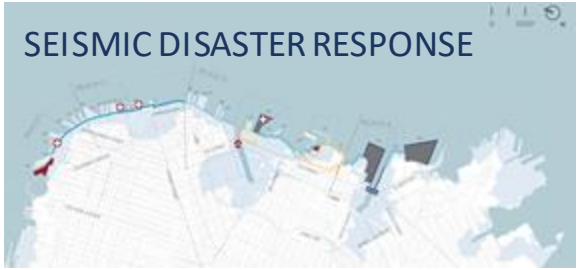

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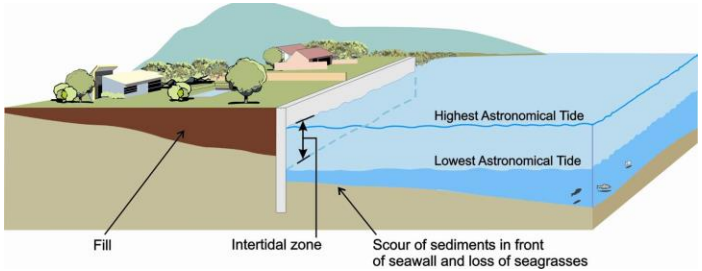
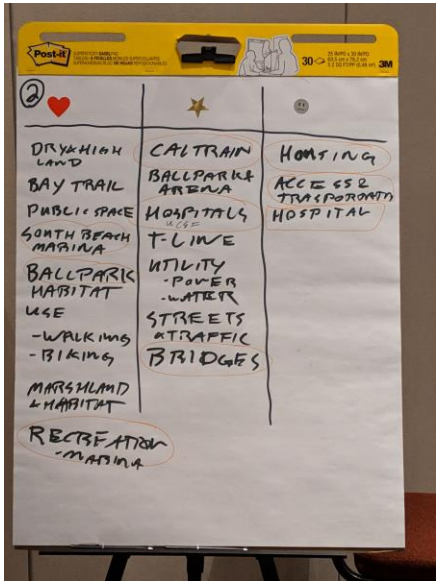


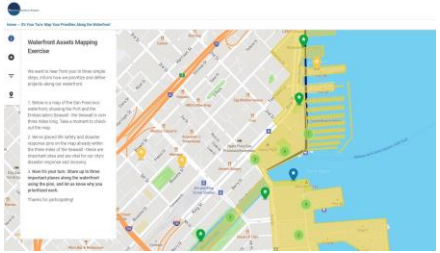
Stakeholder Engagement

What We've Heard from Mission Creek / Mission Bay

FEEDBACK ON GEOGRAPHIC PROGRAM GOALS

Mission Creek / Mission Bay Feedback





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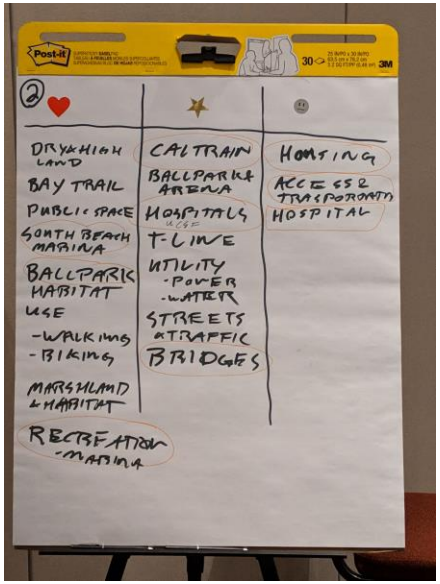

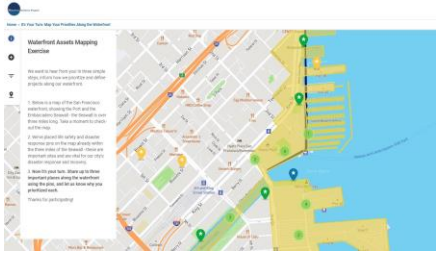

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- Key focus on transportation assets

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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
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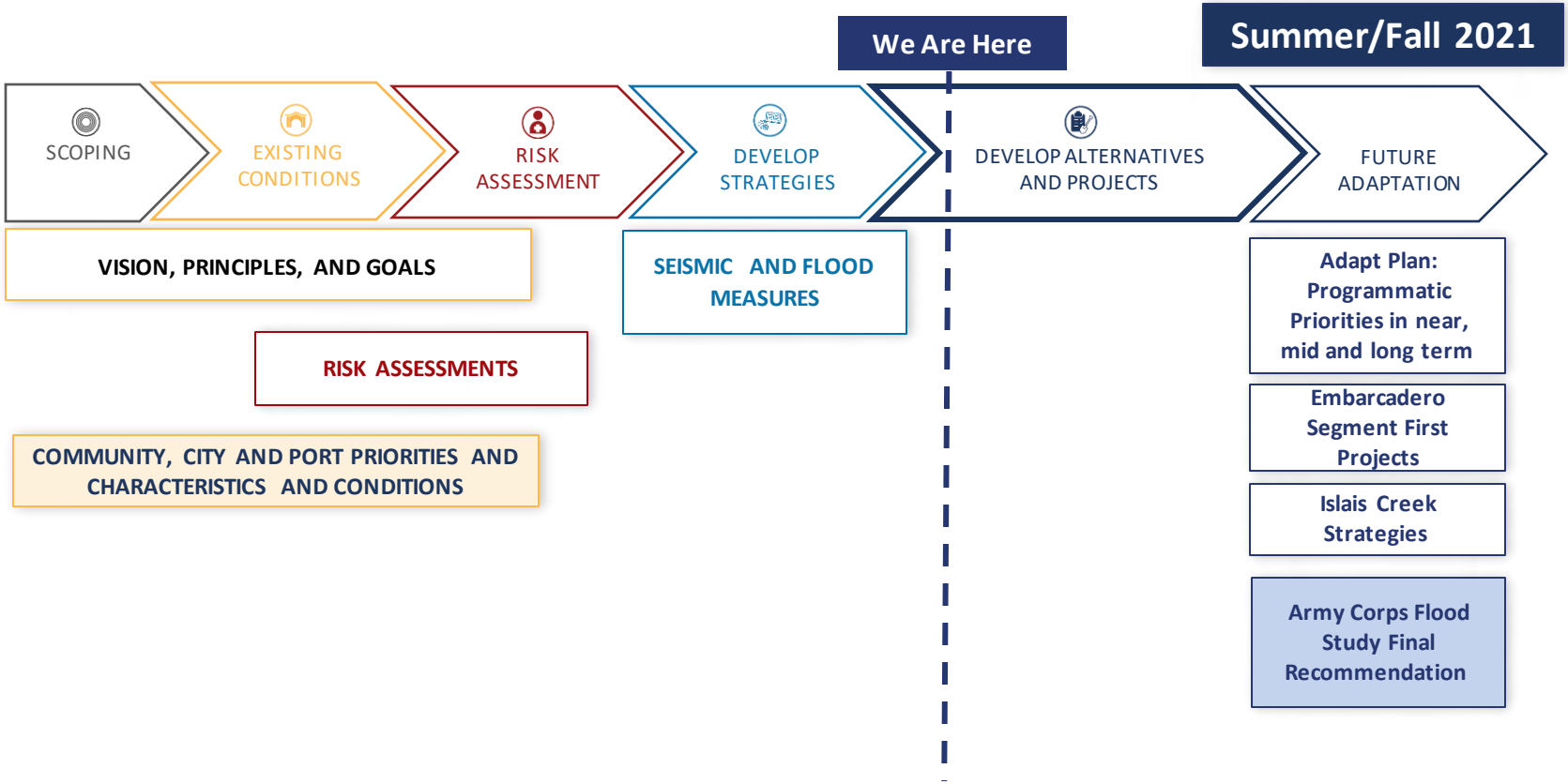
WATERFRONT RESILIENCE PROGRAM STEPS



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Coming Soon...

Job Opportunities May Include:

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

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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 Central Waterfront

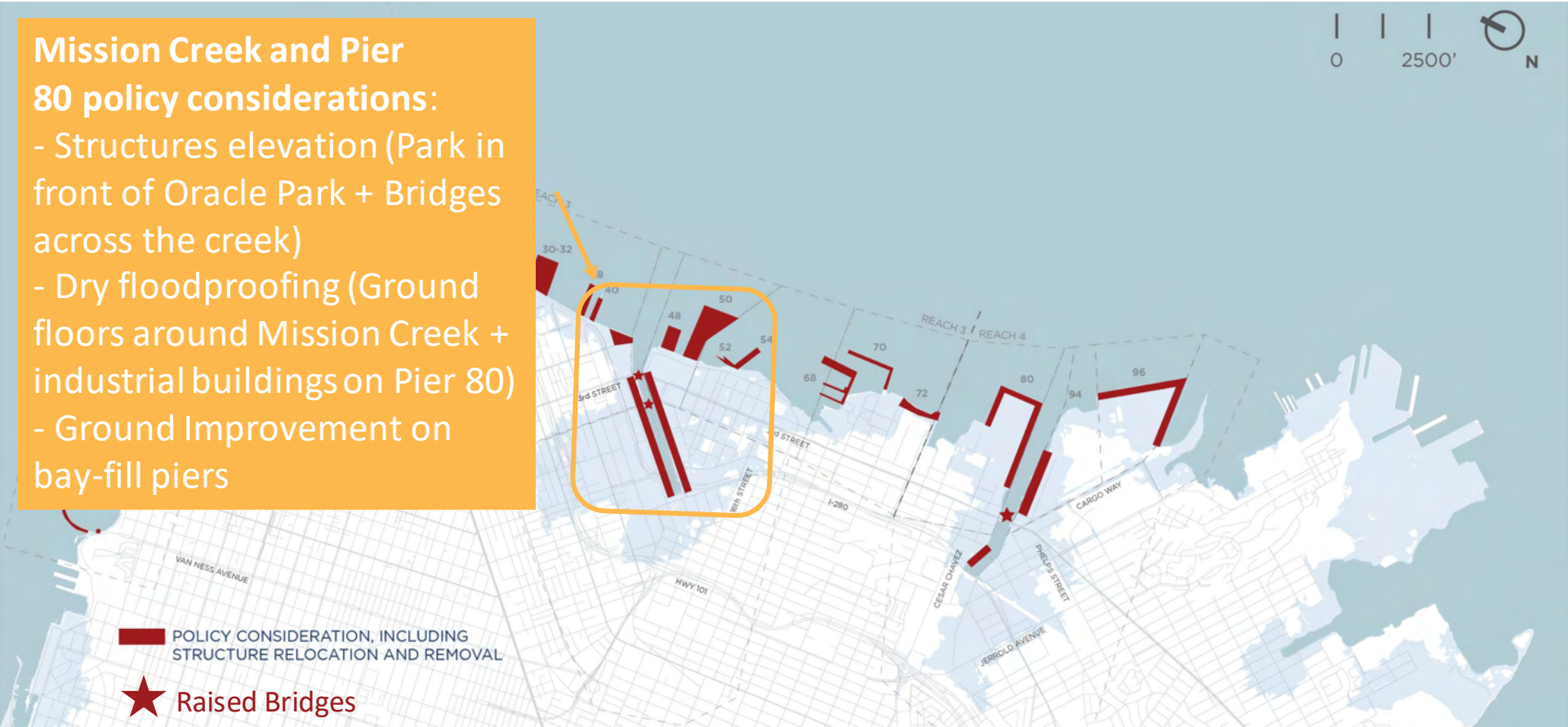
Mission Bay identified measures include:

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

FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

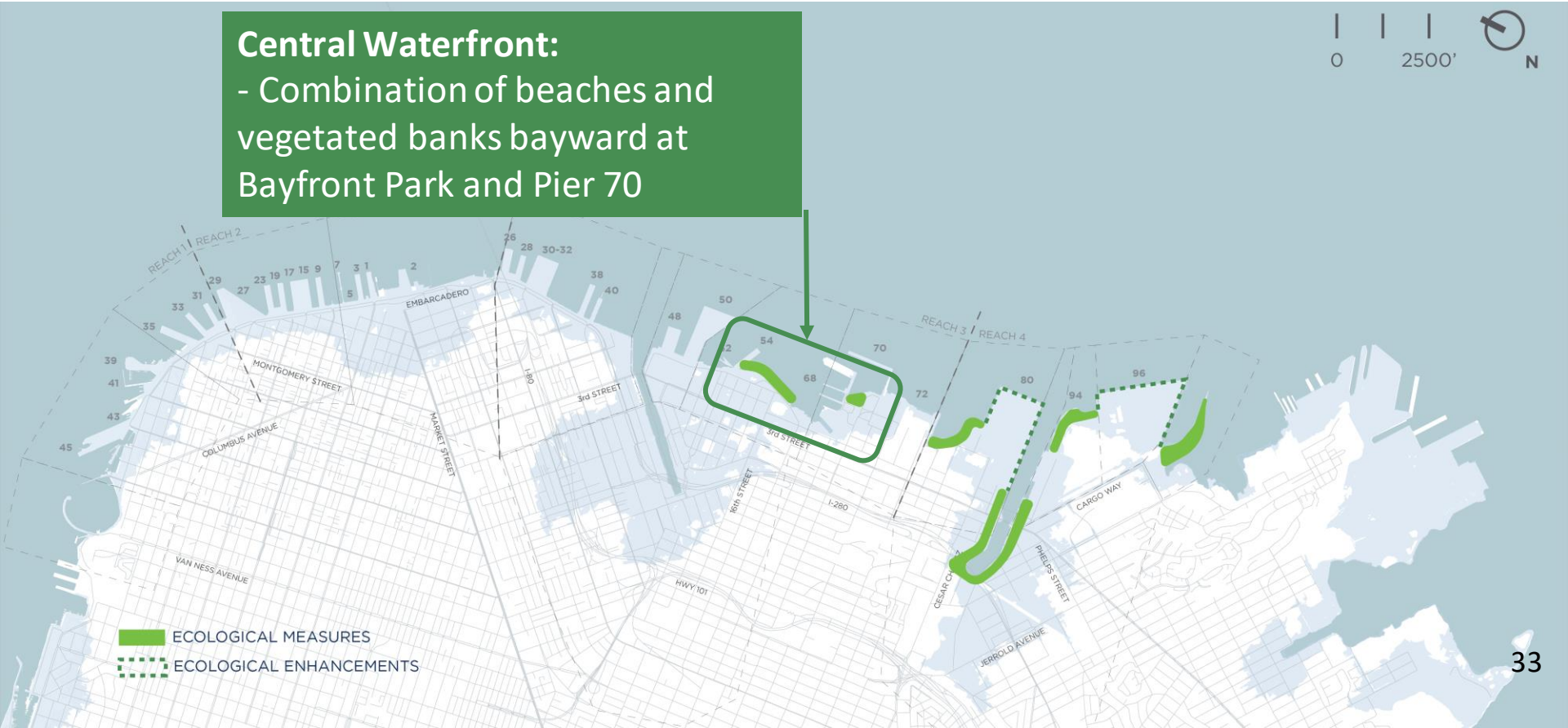
Other Measures Considered in the Central Waterfront

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



FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Nature Based Measures Applied to the Central Waterfront



Thank You!

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

Waterfront Resilience Program Updates

Potrero Boosters

February 23, 2021

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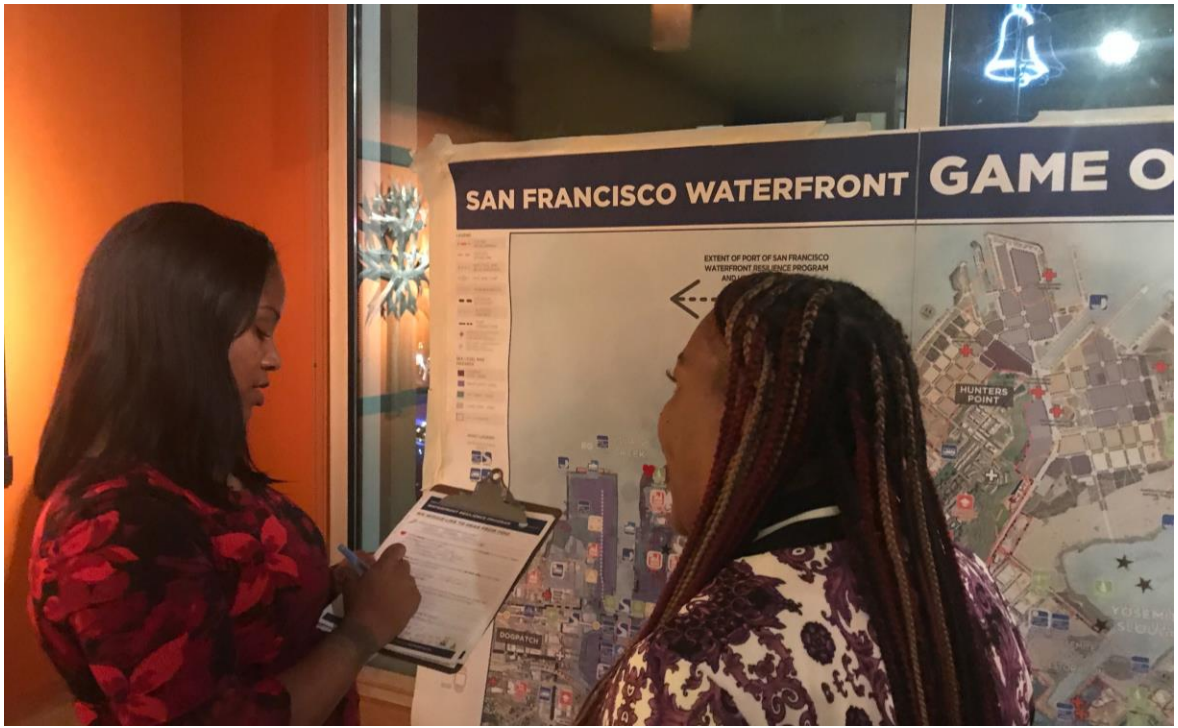
Waterfront Resilience Program

TODAY'S AGENDA

Presentation Overview



- Waterfront Resilience Program background
- Flood risk in Mission Creek / Mission Bay
- How can we reduce risk?
- Stakeholder engagement
- Next steps

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

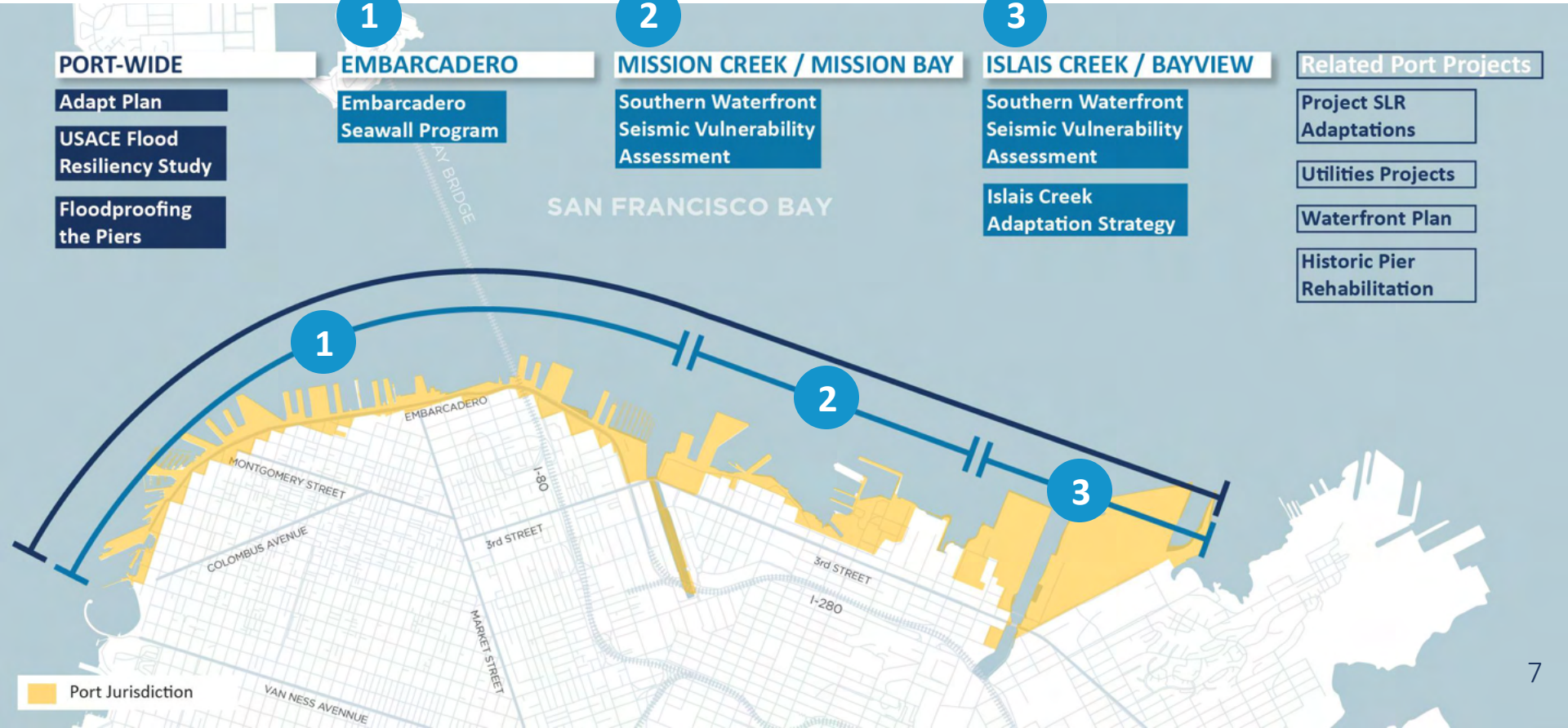
WATERFRONT RESILIENCE PROGRAM DRAFT PRINCIPLES CONTINUED

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

Waterfront Resilience Program (Flood Study & Seawall)

Strengthen Adapt Envision

Waterfront Plan Update

Hazard & Climate Resilience Plan

Climate Action Strategy

Islais Creek Adaptation Strategy

CR General Plan Updates

Ocean Beach Adaptation

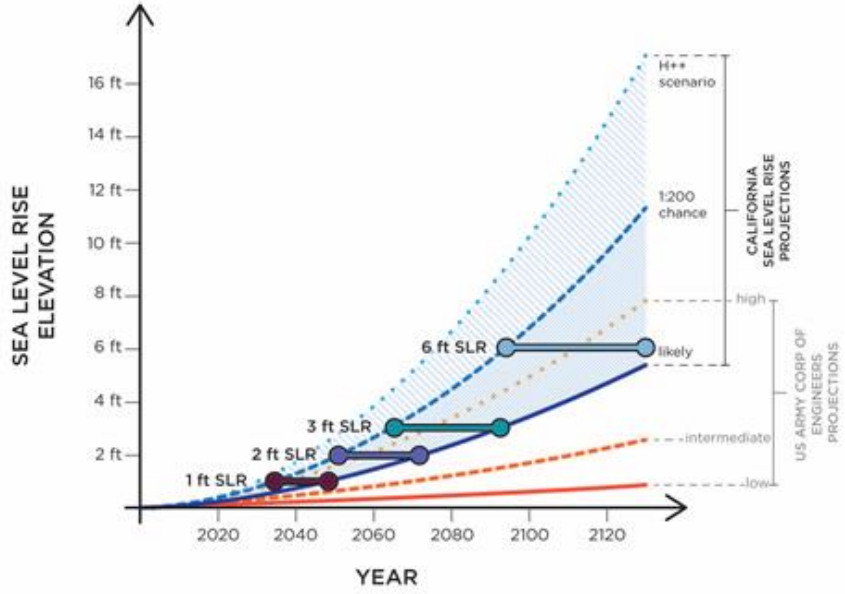
Bayview Resilience Strategy

Flood Risk in Mission Creek / Mission Bay

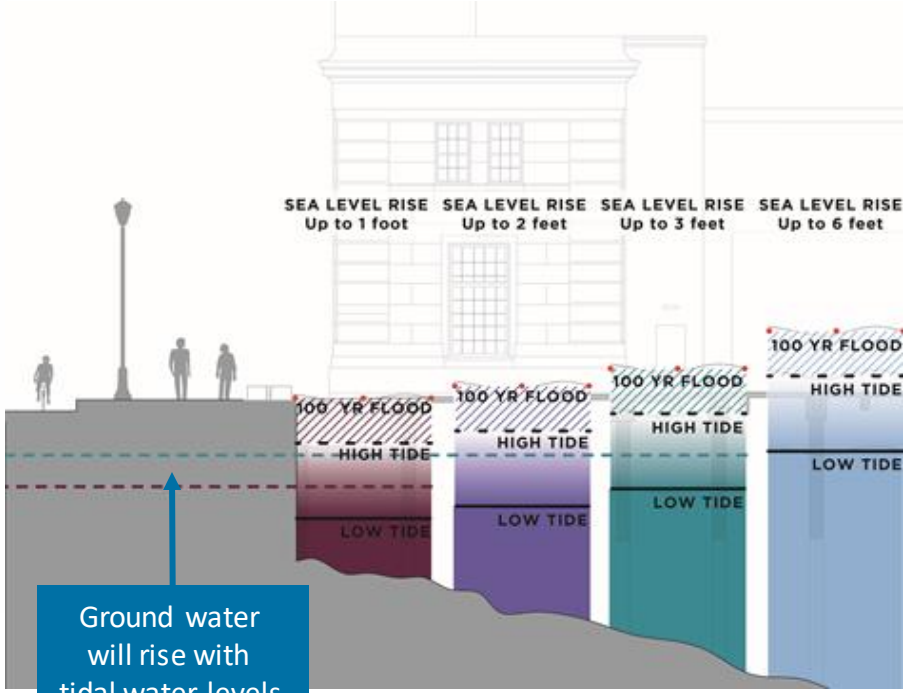
Overview of Projects and What Is at Risk

FLOOD SCENARIOS

Determining Risk Over Time



State of CA – Updated 2018; USACE – Updated 2013



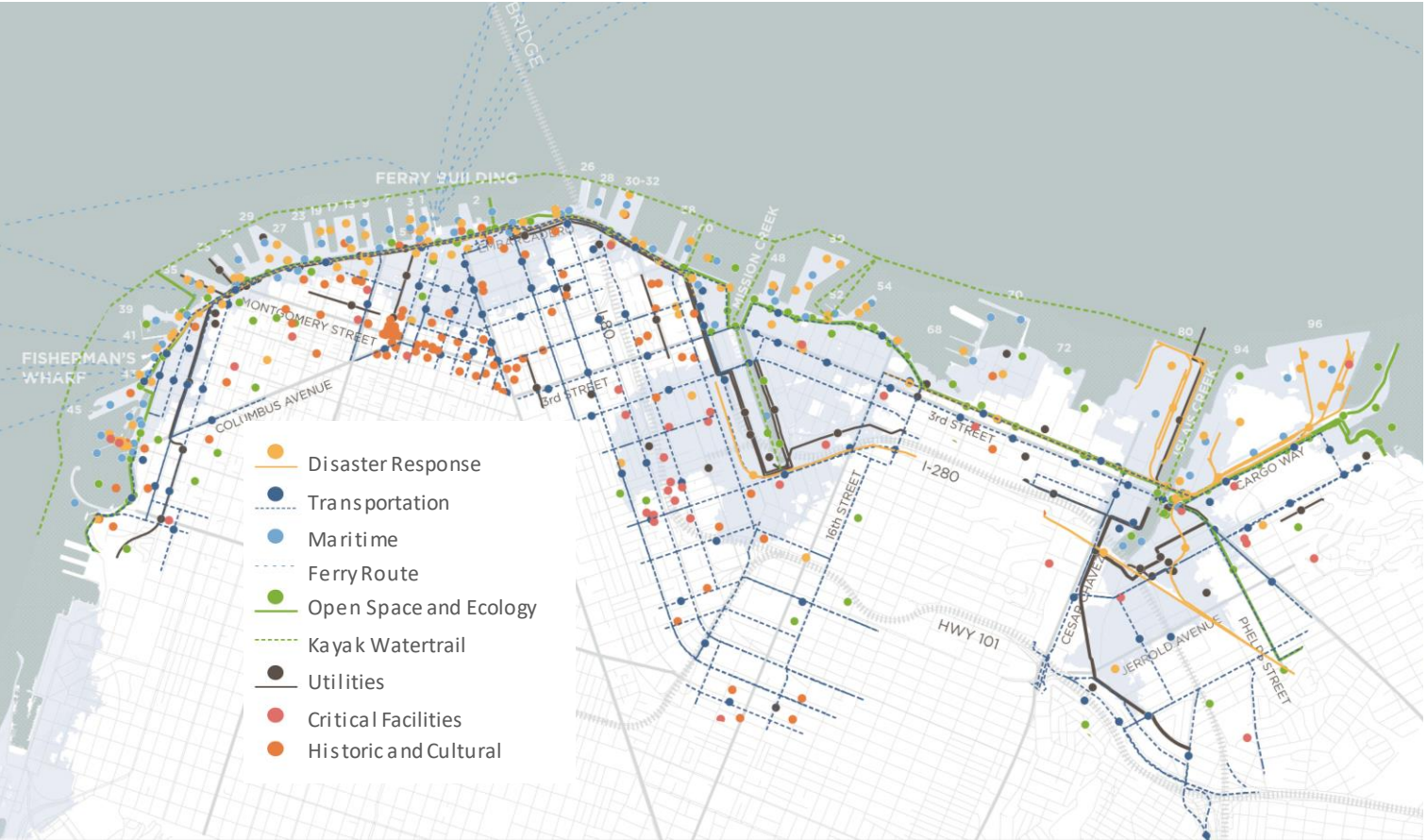
U.S. ARMY CORPS OF ENGINEERS (USACE) FLOOD RESILIENCY STUDY

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

STUDY WIDE ASSETS AT RISK

U.S. Army Corps of Engineers Flood Resiliency Study



At Risk:

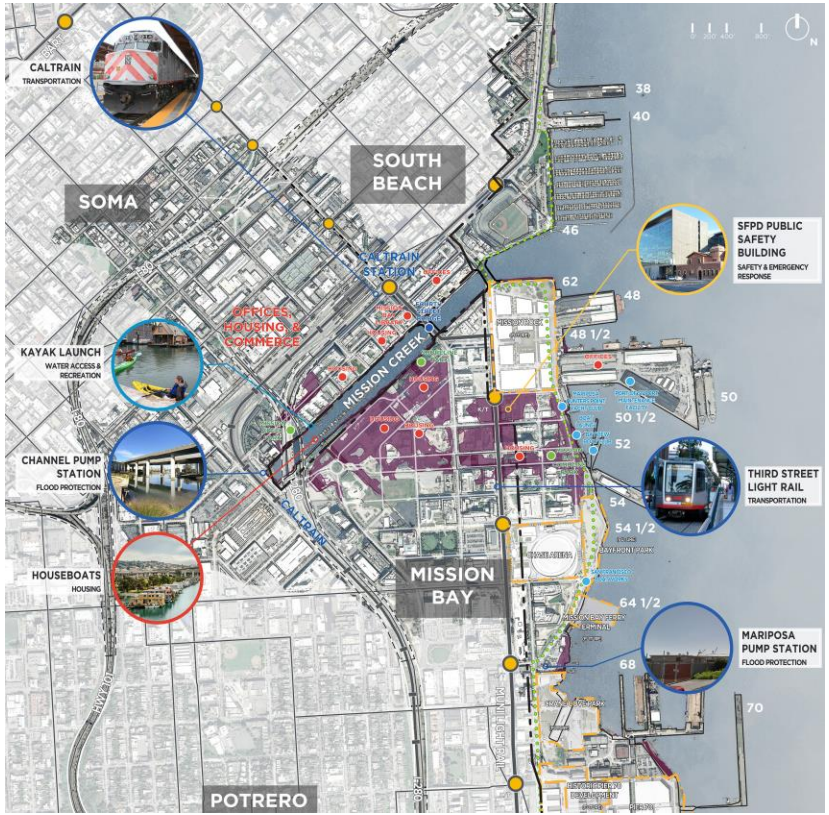
- 40 miles of roadway
- 25 miles of Muni & cable car track
- 11,000 jobs
- 13,500 residents, 58% people of color
- Wastewater functions for 580,000 residents

NEAR-TERM FLOOD RISK IN MISSION CREEK / MISSION BAY

U.S. Army Corps of Engineers Flood Resiliency Study

Assets with current and near-term flood risk include:

- Houseboats
- Channel & Mariposa Pump Stations
- Caltrain & Third Street Light Rail
- SFPD Public Safety Building
- Kayak Launch



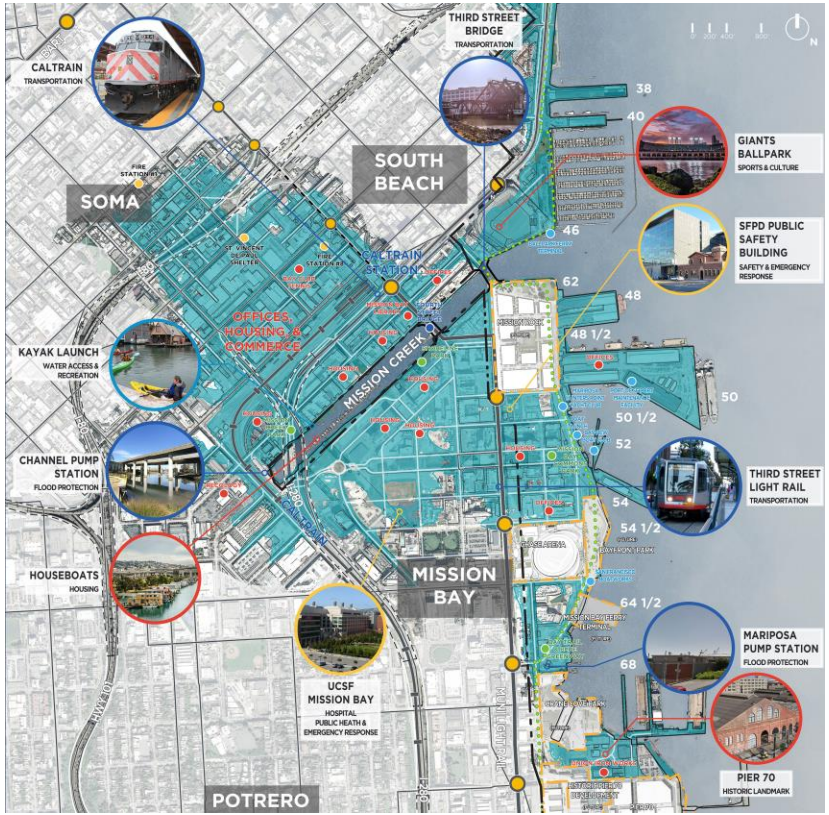
100 year flood event

MID- TO LONG-TERM FLOOD RISK IN MISSION CREEK / MISSION BAY

U.S. Army Corps of Engineers Flood Resiliency Study

Mid- to long-term flood risk includes:

- Third Street Bridge
- San Francisco Giants Ballpark
- UCSF Mission Bay
- Pier 70



100 year flood event + 3' SLR

FEEDBACK FROM "ASSET MAPPING" EXERCISE

Mission Creek / Mission Bay Feedback

- Waterfront and Views
- Habitat
- Ballpark
- Commercial Districts
- Maritime
- Transportation
- Housing and Multi-Use Developments

What people love about the waterfront

- Mission Bay Hospital (UCSF)
- Utilities and Treatment Systems
- Maritime
- Transit
- Evacuation and Emergency Response, including Police Facilities

Assets important to the City

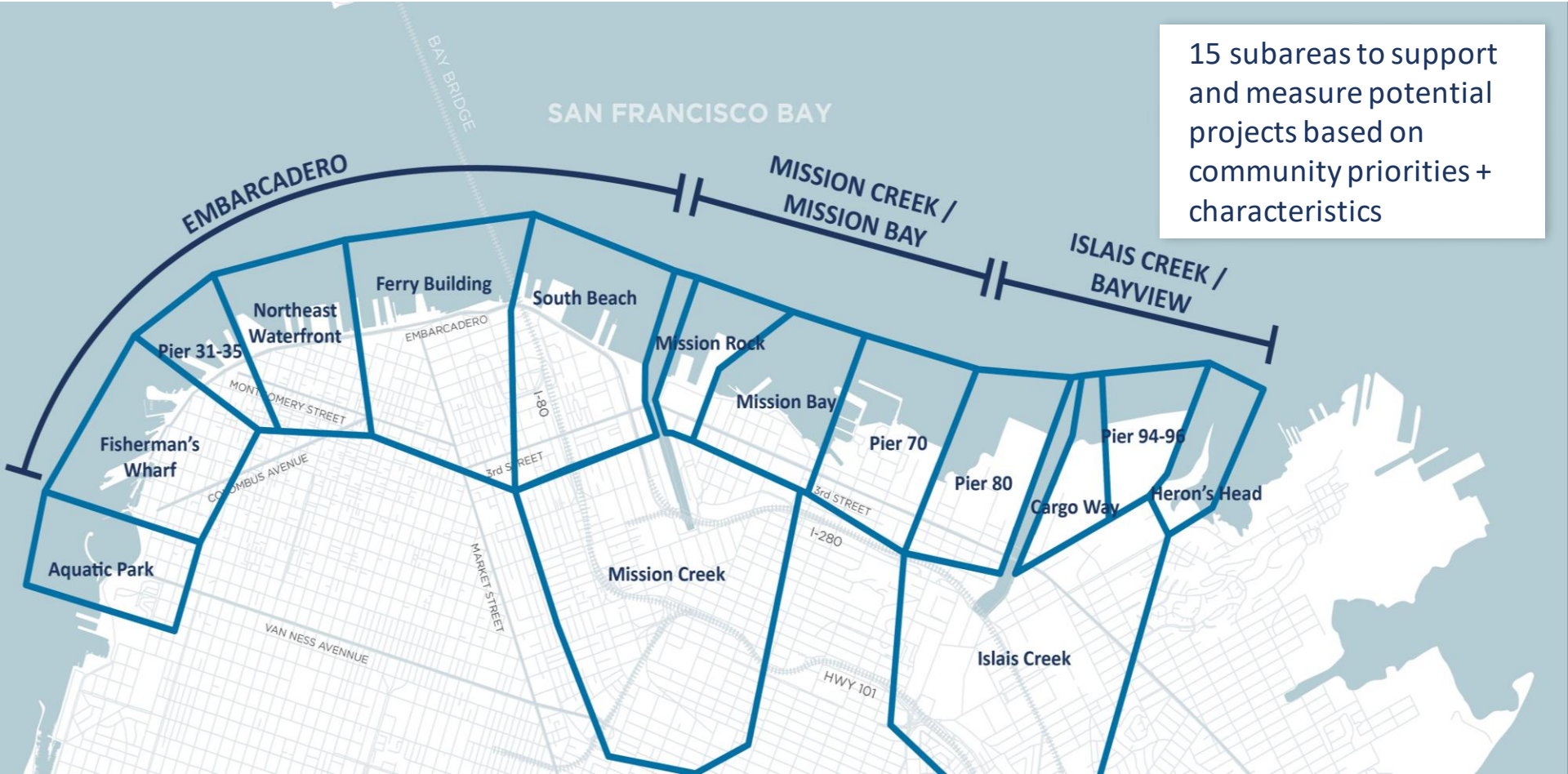
- Mission Bay Hospital (UCSF)
- Transportation Network
- Utilities/Treatment Systems/Pump Station
- Saltwater Inundation and Ecological Concerns
- Housing
- Evacuation/ Emergency Response

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

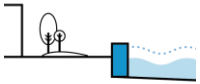


HOW CAN WE REDUCE FLOOD RISK?

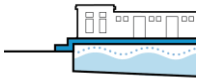
Measures to Reduce Flood

Physical and Policy

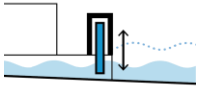
Levees



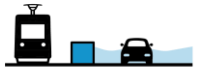
Seawalls



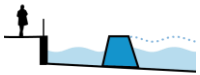
Raised Marine Structures



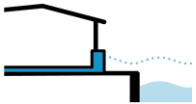
Tide Gates



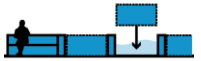
Floodwalls



Breakwaters



Building Adaptations



Deployables

Ecological

Ecological Marine Structures

Ecological Features

Aquatic Habitat

Ecological Shorelines

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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:
Intertidal to supratidal

SHORELINE LOCATION:
Shoreline

DESIGN LIFE	ADAPTABILITY	IMPA
Decades	Medium	

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

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

DESCRIPTION:
Plantings can be added to the voids between a revetment to create riparian and fish habitat. Plants can slow flow and revetments protect coastal shorelines and river banks. articulated concrete blocks (ACB), marine mattress or bare slopes in low wave and/or weak flow locations

CONSIDERATIONS:
- Design should anticipate migration pathways or re-planting as sea levels rise

Measures Profile
Super Bulkhead Wharf
Seismic Adaptation Measure

SHORELINE STABILIZATION

TYPE: Structural

SHORELINE LOCATION:
Nearshore

Example of piles installed to support new wharf structure ©SGH

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

SEISMIC HAZARDS MITIGATED:		SEISMIC PERFORMANCE IMPROVED:	
Lateral Spreading	Liquefaction	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:	ADVANTAGES:	DISADVANTAGES:
• 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. • Replaces deteriorated wharf structures. Can elevate wharf for future sea level rise protection.	• Construction would require closure of waterfront buildings and relocation of tenants 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 | Measures 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

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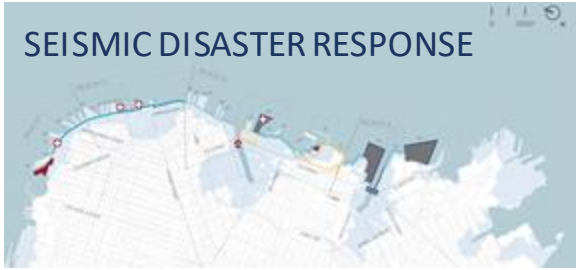

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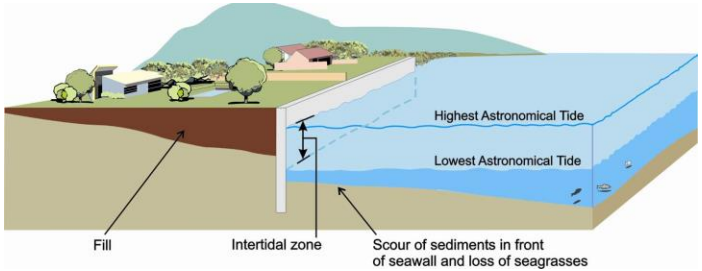

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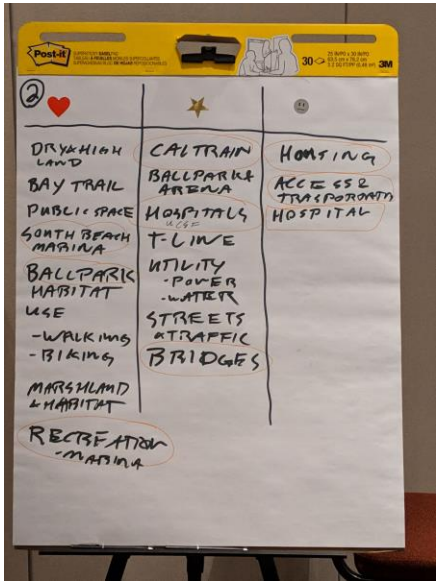

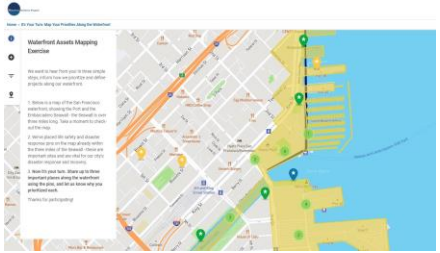

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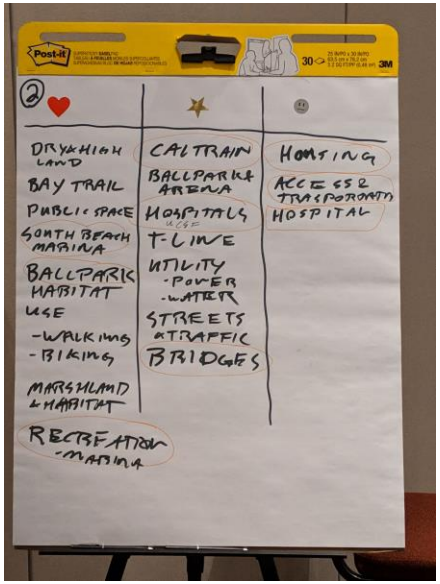

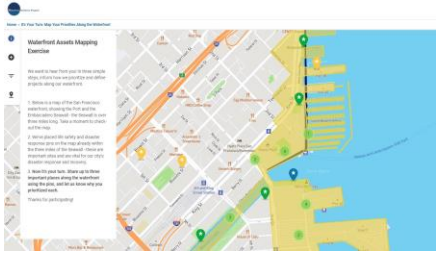

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PORT OF SAN FRANCISCO

Next Steps

What's Next for the Waterfront Resilience Program?

SOUTHERN WATERFRONT SEISMIC VULNERABILITY ASSESSMENT

Overview and Key Highlights

- **Focus:** All hazards, broad resilience (Equity, Environment, Economy)
- **Implementation:** Short, Medium, and Long-Term
- **Lead Agency:** Port of San Francisco

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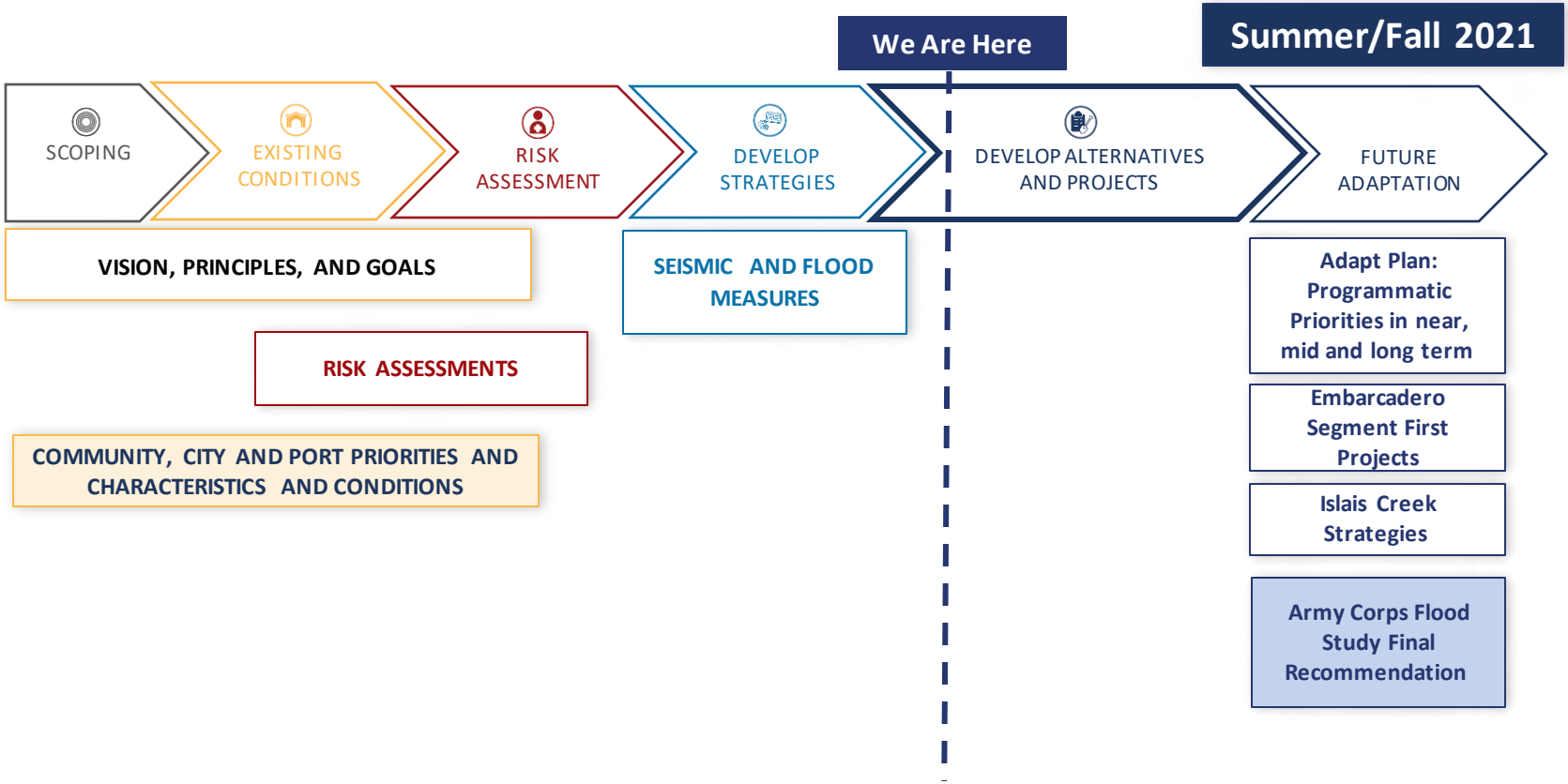
WATERFRONT RESILIENCE PROGRAM STEPS



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- Painters
- Office Engineers
- Schedulers and Document Controls
- Construction Administrative

PORT OF SAN FRANCISCO

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 Mission Creek / Mission Bay and Islais Creek / Bayview
- 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 Central Waterfront

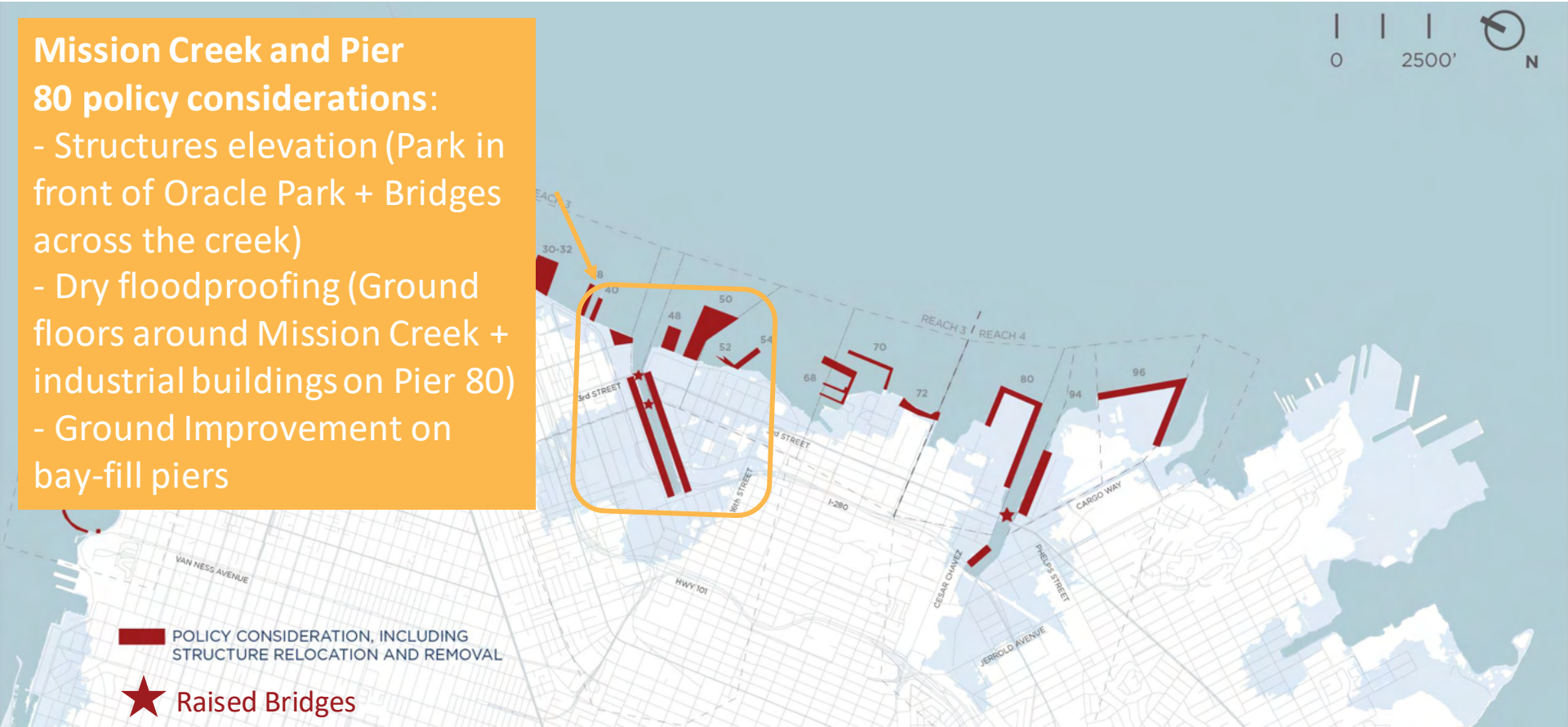
Mission Bay identified measures include:

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

FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Non-Structural Measures Applied to the Central Waterfront

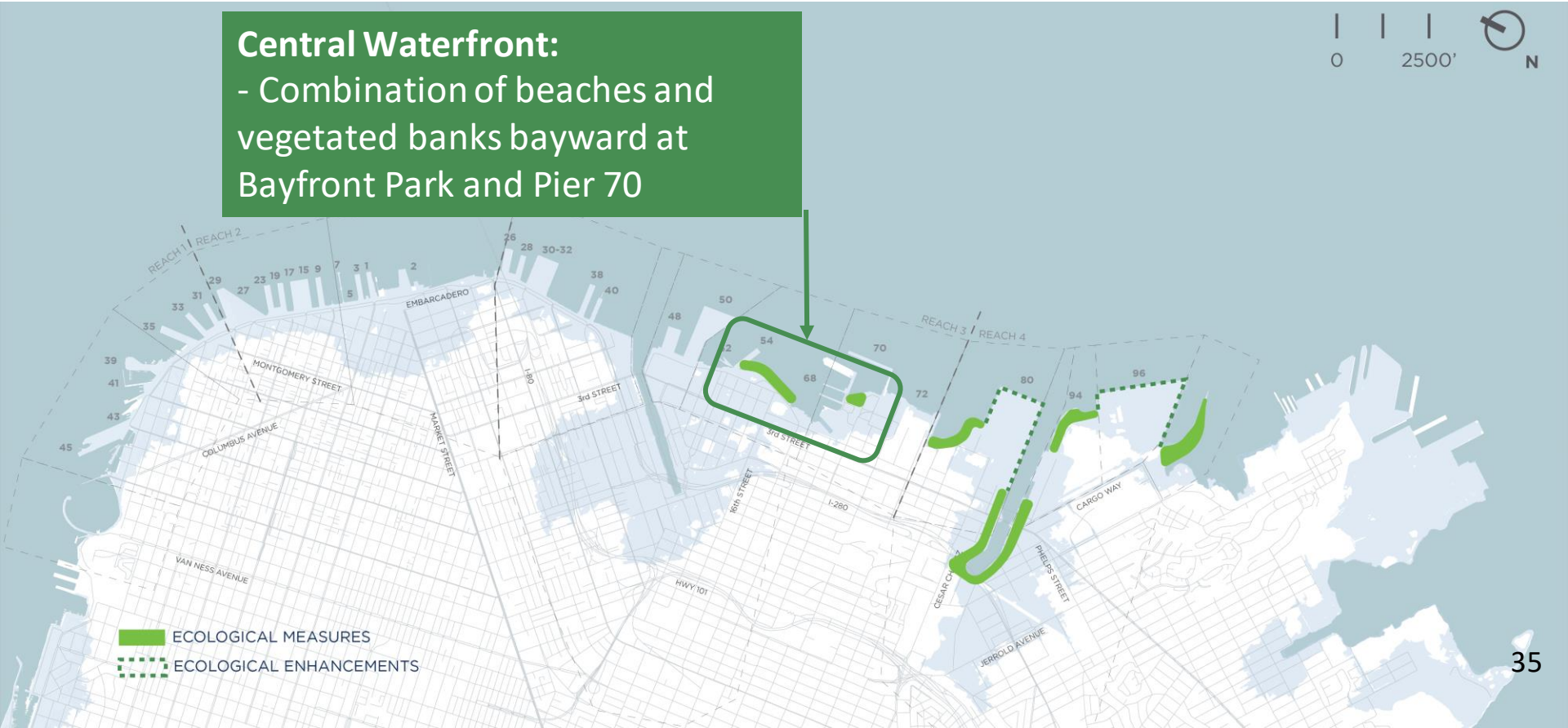
Mission Creek and Pier 80 policy considerations:
- Structures elevation (Park in front of Oracle Park + Bridges across the creek)
- Dry floodproofing (Ground floors around Mission Creek + industrial buildings on Pier 80)
- Ground Improvement on bay-fill piers



FLOOD STUDY FIRST DRAFT OF ALTERNATIVES

Nature Based Measures Applied to the Central Waterfront

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



Thank You!

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