A stylized graphic of a city skyline in yellow and white, with a large yellow seawall structure in the foreground. The seawall is composed of several parallel yellow beams with white outlines, receding into the distance. The background is a solid blue color.

**PROTECT THE CITY  
STRENGTHEN  
THE SEAWALL**

Seawall Earthquake Safety + Disaster  
Prevention Program  
Community Meeting

June 21, 2018



# WELCOME!

- This is our first Seawall Community Meeting, so, we'll start at the beginning
- Tonight, I will present a high level overview
- You can direct your questions to staff at the boards after the presentation
- We're thinking about life safety and visionary ideas
- Thank you so much for joining us!

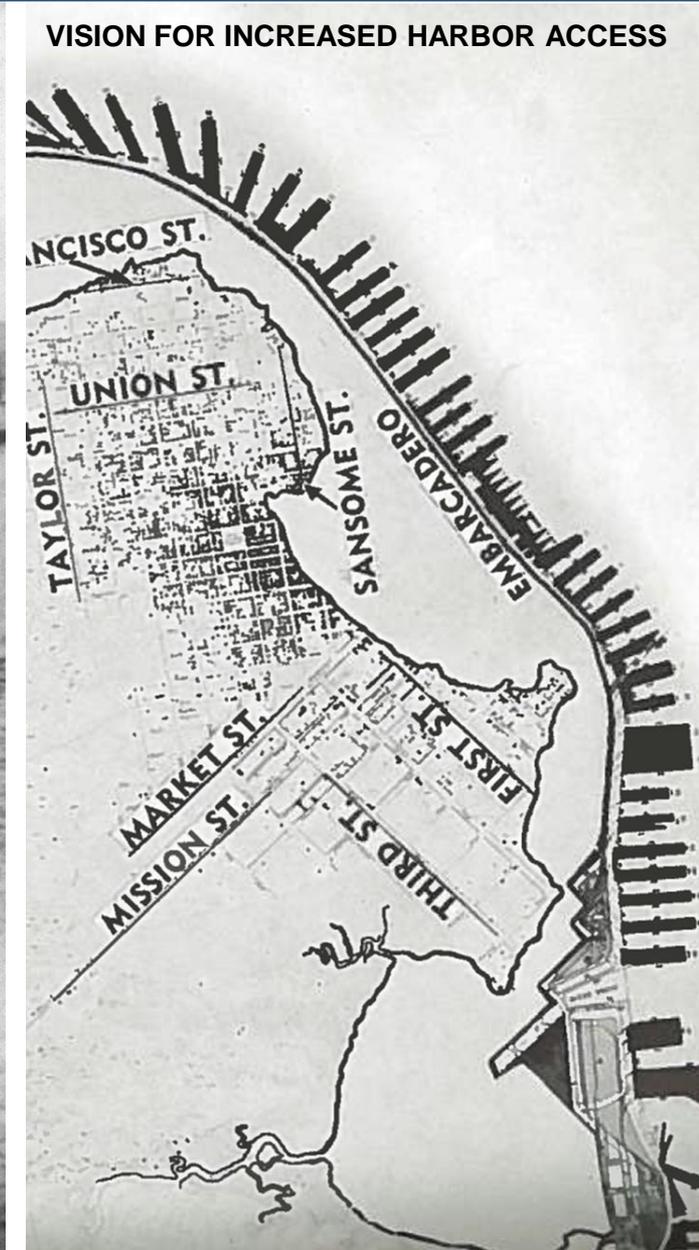
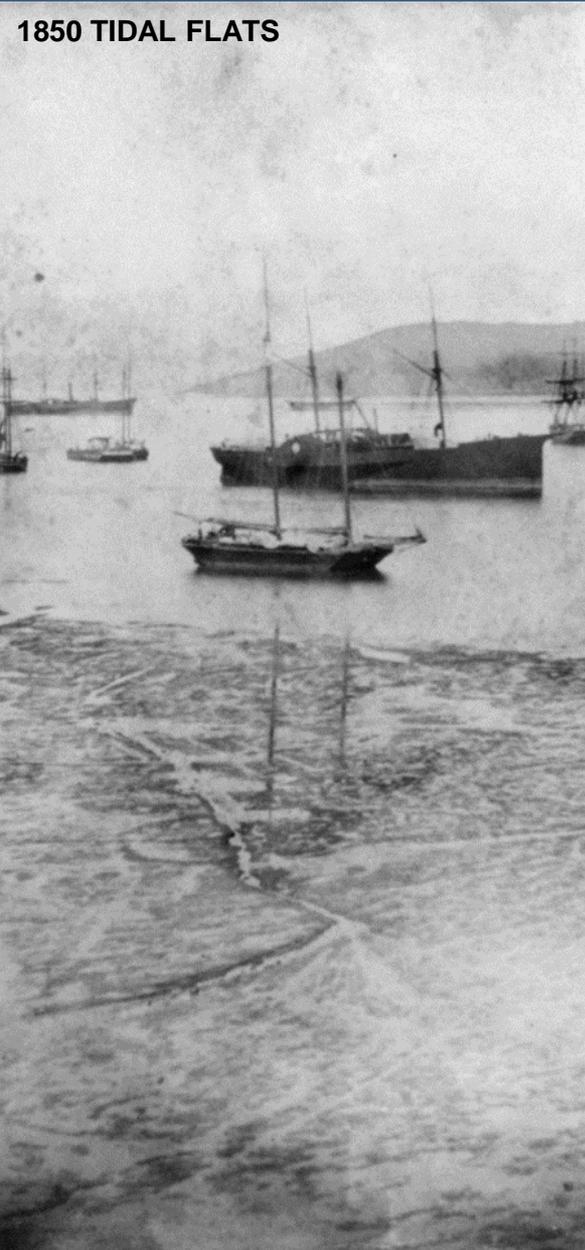


Port Jurisdiction

Historic shoreline

Embarcadero Seawall

# THE EVOLUTION OF THE NORTHERN WATERFRONT



# ORIGINAL EMBARCADERO SEAWALL CONSTRUCTION

- Built to deep water
- Holds filled land in place
- Protects against flooding





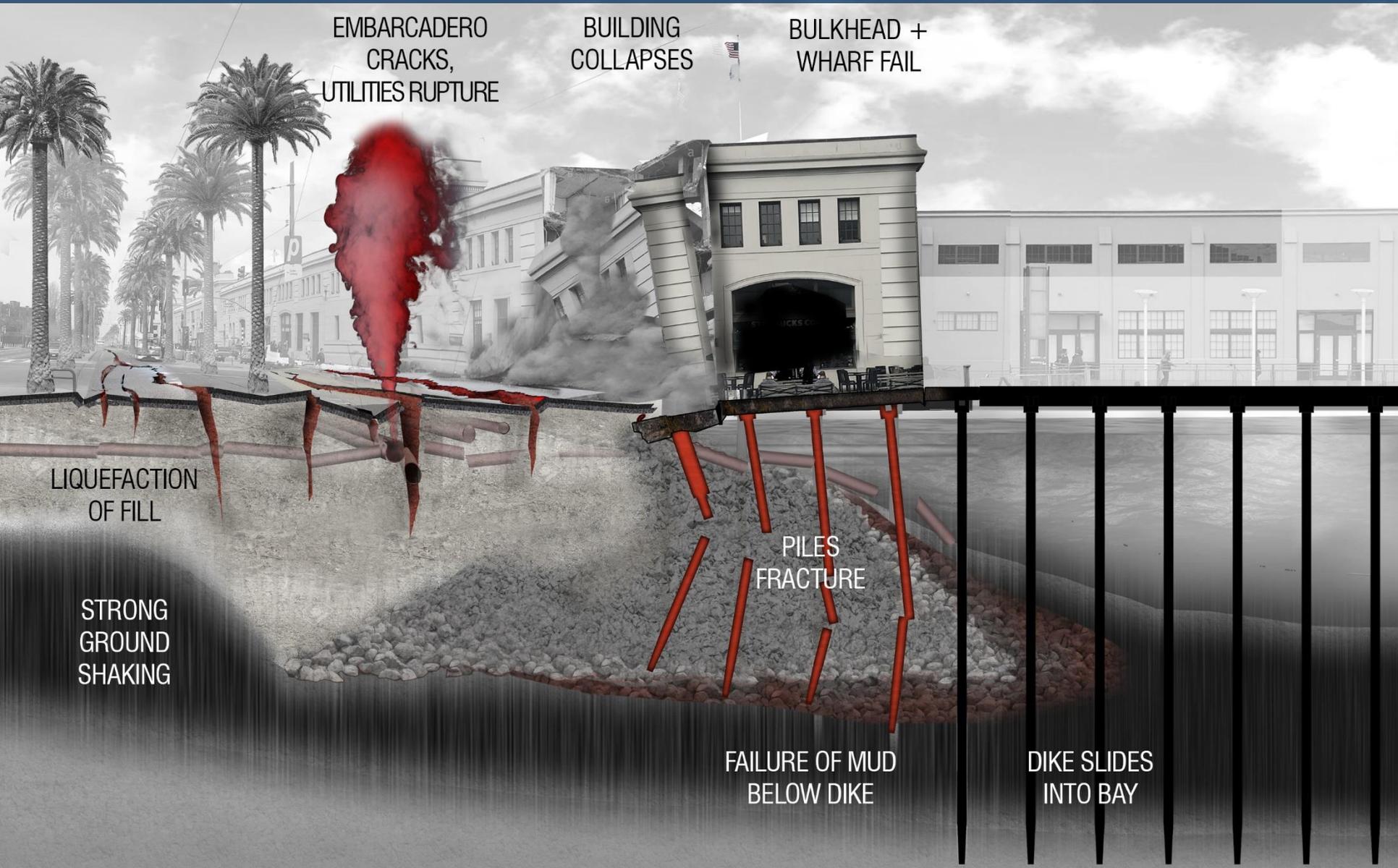
# SAN FRANCISCO'S WATERFRONT TODAY

- Emergency response
- BART/Muni railway
- Utilities
- \$100 billion in assets and activities
- Maritime facilities (Ferry, Water Taxi, Cruise Ship Terminal, etc.)
- Embarcadero Historic District

DETERIORATION, SETTLEMENT, SEISMICALLY UNSAFE



# SAN FRANCISCO FACES URGENT EARTHQUAKE RISKS



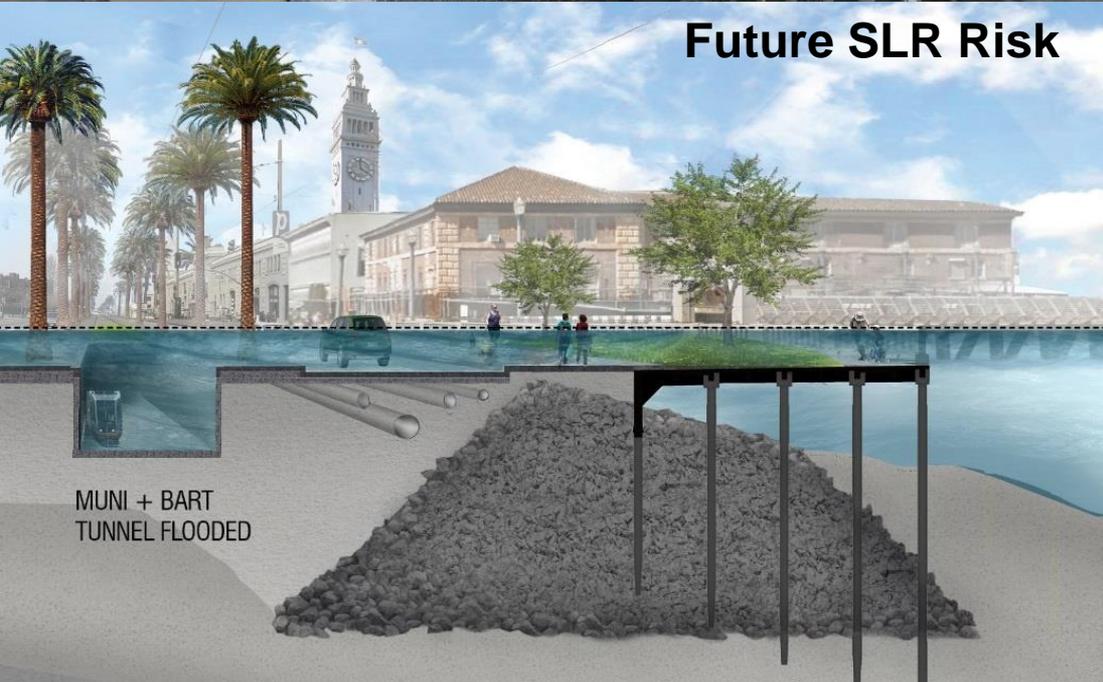
# EVIDENCE OF PRIOR LATERAL SPREADING



## Current Condition



## Future SLR Risk



# CRITICAL RISK: CURRENT AND FUTURE FLOODING

- Seawall supports the Embarcadero and provides flood protection
- Existing Embarcadero closures during king tide
- Muni and BART tunnels subject to flood risk
- CCSF sea level rise guidance:

12"-24" by 2050

36"-66" by 2100

# EARTHQUAKE RETROFIT CONCEPTS

**OPTION 1** GROUND IMPROVEMENT



**OPTION 2** GROUND IMPROVEMENT UNDER SEAWALL



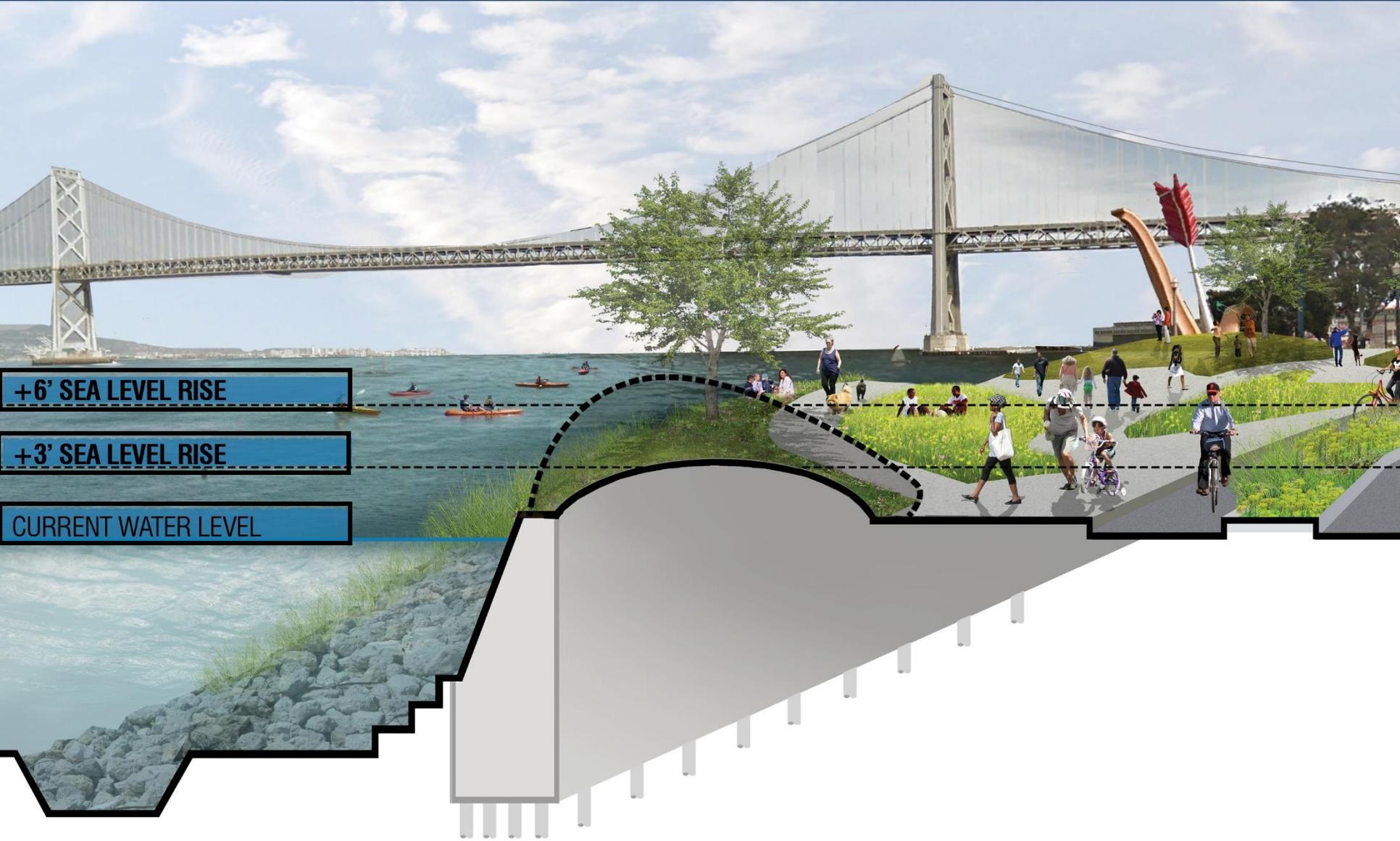
**OPTION 3** BULKHEAD REPLACEMENT



**OPTION 4** NEW BAYWARD SEAWALL



# POTENTIAL SEA LEVEL RISE SOLUTIONS





# SEAWALL PROGRAM FRAMEWORK

## ELEMENTS

2018

2019

2022

2026

2050

2100

1

**STRENGTHEN  
THE SEAWALL  
FOR PUBLIC SAFETY**

**MULTI-HAZARD  
RISK ASSESSMENT**

**ENVIRONMENTAL CLEARANCE,  
ENGINEERING AND PERMITTING**

**CONSTRUCTION**

1

## **STRENGTHEN ELEMENT**

**STRENGTHEN  
THE SEAWALL  
FOR PUBLIC  
SAFETY**

### **Objective:**

Immediately implement highest priority Disaster Response and Life Safety Projects along the Embarcadero Seawall.

### **Planning and Implementation**

#### **Horizon:**

2018-2026

#### **Priorities:**

Current Seismic & Flood Risk

#### **Geographic Focus:**

Embarcadero Seawall

# SEAWALL PROGRAM FRAMEWORK

ELEMENTS	2018	2019	2022	2026	2050	2100
<b>1</b> STRENGTHEN THE SEAWALL FOR PUBLIC SAFETY	MULTI-HAZARD RISK ASSESSMENT	ENVIRONMENTAL CLEARANCE, ENGINEERING AND PERMITTING	CONSTRUCTION			
<b>2</b> ADAPT TO MID-CENTURY RISKS	MULTI-HAZARD RISK ASSESSMENT	PLAN DEVELOPMENT UPDATED EVERY 5 YEARS		ENVIRONMENTAL CLEARANCE, ENGINEERING AND PERMITTING		



**STRENGTHEN ELEMENT**

STRENGTHEN THE SEAWALL FOR PUBLIC SAFETY

**Objective:**  
Immediately implement highest priority Disaster Response and Life Safety Projects along the Embarcadero Seawall.

**Planning and Implementation Horizon:**  
2018-2026

**Priorities:**  
Current Seismic & Flood Risk

**Geographic Focus:**  
Embarcadero Seawall



**ADAPT ELEMENT**

ADAPT TO MID-CENTURY RISKS

**Objective:**  
Identify policies and projects that will result in a Port that is resilient to seismic and increasing flood risks and that can respond to changing priorities. Projects will be integrated into city, regional and private actions, resulting in coordinated actions to increase waterfront resilience.

**Planning and Implementation Horizon:**  
2020-2050, Plan updated every five years

**Priorities:**  
Seismic Risk and Future Flood Risk

**Geographic Focus:**  
Entire Port Jurisdiction

# SEAWALL PROGRAM FRAMEWORK

ELEMENTS	2018	2019	2022	2026	2050	2100
<b>1</b> STRENGTHEN THE SEAWALL FOR PUBLIC SAFETY	MULTI-HAZARD RISK ASSESSMENT	ENVIRONMENTAL CLEARANCE, ENGINEERING AND PERMITTING	CONSTRUCTION			
<b>2</b> ADAPT TO MID-CENTURY RISKS	MULTI-HAZARD RISK ASSESSMENT	PLAN DEVELOPMENT UPDATED EVERY 5 YEARS	ENVIRONMENTAL CLEARANCE, ENGINEERING AND PERMITTING			
<b>3</b> ENVISION THE WATERFRONT IN 2100	SCOPING ACTIVITIES	VISION DEVELOPMENT UPDATED EVERY 10 YEARS				



## STRENGTHEN ELEMENT

STRENGTHEN THE SEAWALL FOR PUBLIC SAFETY

**Objective:**  
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ADAPT TO MID-CENTURY RISKS

**Objective:**  
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**Planning and Implementation Horizon:**  
2020-2050, Plan updated every five years

**Priorities:**  
Seismic Risk and Future Flood Risk

**Geographic Focus:**  
Entire Port Jurisdiction



## ENVISION ELEMENT

ENVISION THE WATERFRONT IN 2100

**Objective:**  
Develop visions that can respond to remaining seismic risk and increasing flood risks and have an ongoing public conversation about the trade-offs of different options.

**Planning and Implementation Horizon:**  
2050-2100, Vision Element updated every 10 years

**Priorities:**  
Seismic Risk and Future Flood Risk

**Geographic Focus:**  
Entire Port Jurisdiction

# STAKEHOLDER + TECHNICAL SUPPORT



- Policy and Technical Advisory Committee
- Quarterly Seawall Community Meetings
- Resource Agency Working Group
- Focused Briefings
- Online Engagement



# SEAWALL PROGRAM GOALS

- Act Quickly
- Reduce Earthquake Damage
- Improve Flood Resilience
- Engage the Community
- Enhance the City and the Bay
- Preserve Historic Resources

# ESTIMATED SEAWALL PROGRAM FUNDING

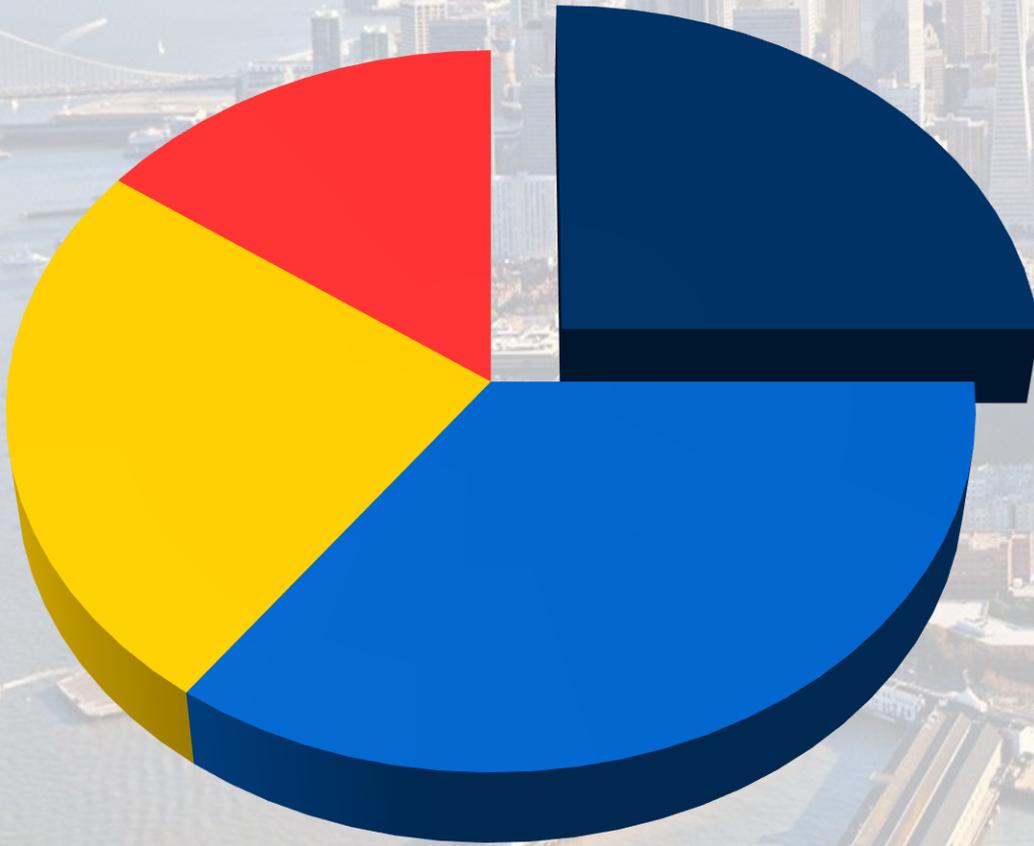
Full infrastructure improvements are anticipated to cost up to \$5 billion

- Local (City GO Bond Program)
- Federal (Water Resources, Transportation)
- State (Cap and Trade, State Share of Tax Increments)
- Private (Waterfront Development Project and Businesses)

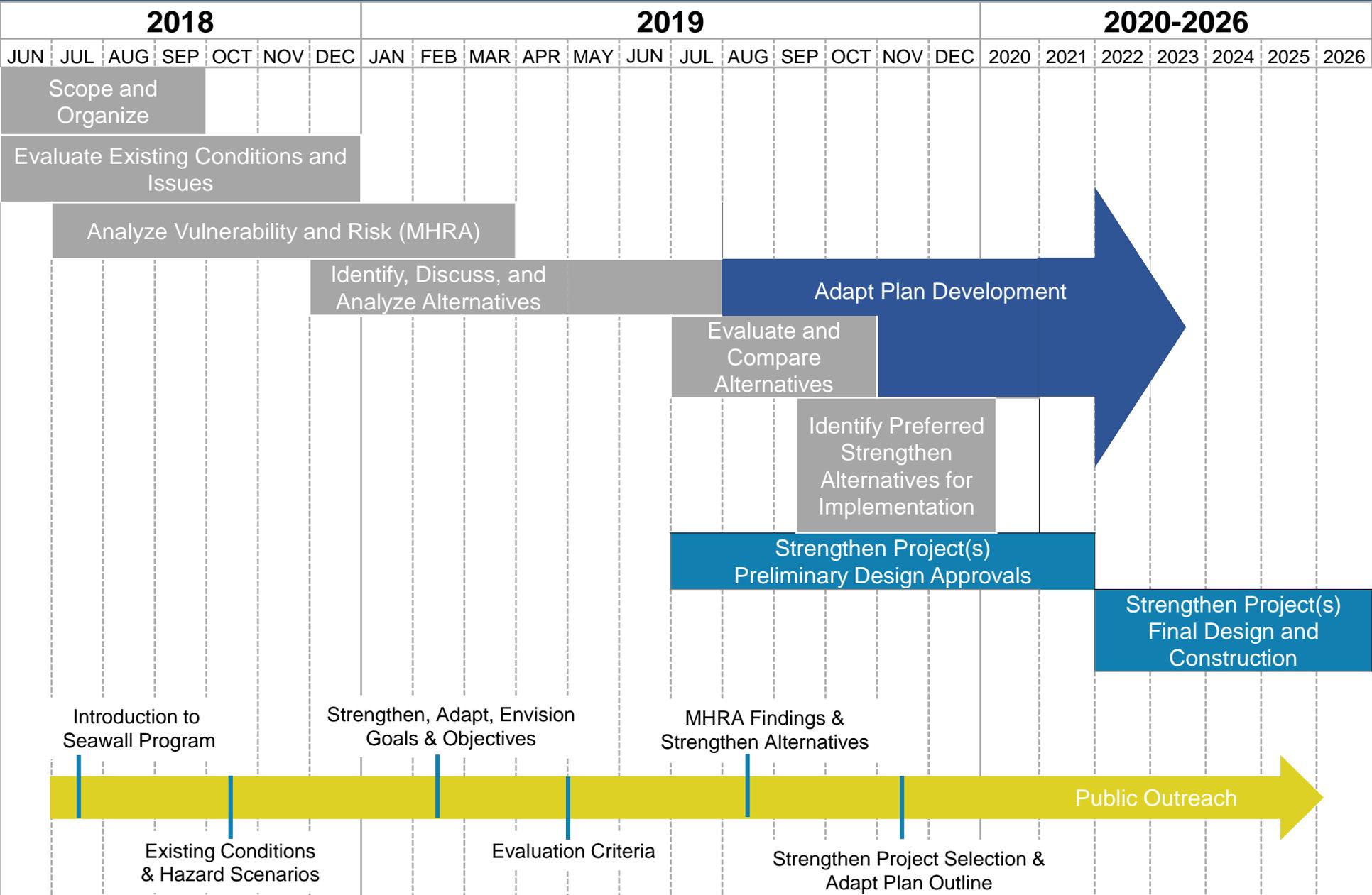
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The Port has identified potential sources for Phase I (\$500 million) to address immediate life safety improvements including:

- \$425 million City GO Bond Program
- \$55 million State
- \$10 million Federal
- \$8 million Port of San Francisco
- \$2 million San Francisco Municipal Transportation Agency and the Planning Department



# SEAWALL PROGRAM TIMELINE



# THE PORT SUCCESSFULLY MANAGES BIG PROJECTS



EXPLORATORIUM



CRUISE TERMINAL



AT&T BALLPARK

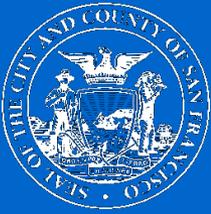


FERRY BUILDING



## WHAT'S NEXT

- Questions? Head to a subject-matter table to talk directly with Port staff
- Comment cards for written feedback
- Next Community Meeting in September
- Sign up for eNewsletters and follow the Port on social media for updates
- We want you to stay engaged!

A stylized graphic of a city skyline in yellow and orange, with a large yellow seawall structure in the foreground. The seawall is composed of several parallel yellow bars of varying lengths, creating a stepped effect. The background is a solid blue color.

**PROTECT THE CITY  
STRENGTHEN  
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**Thank you!**

Lindy Lowe, Port of San Francisco  
Resilience Program