Waterfront Resilience Program Update & Second Seawall Bond Request
December 5, 2022
AGENDA

- Embarcadero Early Projects Overview & Next Steps
- Pilot Project – Living Seawall
- Seawall Bond & Program Funding
- Program Risks, Challenges, and Opportunities
WATERFRONT RESILIENCE PROGRAM EFFORTS

Overview

1. PORT-WIDE
   - Adapt Plan
   - USACE Coastal Flood Study
   - Floodproofing the Piers
   - Waterfront Adaptation Strategies

2. EMBARCADERO
   - Embarkadero Seawall
   - Multi-Hazard Risk Assessment
   - Early Projects
   - Living Seawall Pilot

3. MISSION CREEK / MISSION BAY
   - Initial Southern Waterfront Earthquake Assessment
   - Mission Bay Port-SPUR Adaptation Study

3. ISLAIS CREEK / BAYVIEW
   - Islais Creek Mobility Adaptation Strategy

RELATED PORT PROJECTS
- Historic Pier Rehabilitation
- Project Sea Level Rise Adaptations
- Utilities Projects
- Waterfront Plan
Embarcadero Early Project

Overview & Development
DEFINING EMBARCADERO EARLY PROJECTS

Goals for Embarcadero Early Projects

- Identify Implementable Projects
- Reduce EQ Risk
  Prioritize Life Safety + Disaster Response Capability
- Reduce Flood Risk
  Near-Term Flood Defenses & Later Adaptation
EMBARCADERO EARLY PROJECTS LIST

23 Embarcadero Early Projects Identified & Evaluated

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

6 of 12 Needs Assessment Reports Completed
WATERFRONT RESILIENCE PROGRAM PROJECT DEVELOPMENT PROCESS

Overview

1. INITIAL PLANNING
2. PRE-DESIGN
   a. Needs Assessment
   b. Alternatives Analysis
   c. Conceptual Engineering
3. DETAIL DESIGN / ENVIRONMENTAL REVIEW
4. CONSTRUCTION
5. CLOSEOUT
Embarcadero Early Projects

Needs Assessment Report Updates
WHARF J9 REPLACEMENT & RESILIENT SHORELINE PROJECT

Project Vision: Objectives, Constraints, and Other Considerations

- Replace Wharf J9 and seawall with a resilient structure to protect the shoreline in earthquakes and help defend Fisherman’s Wharf from sea level rise
- Increase disaster response capability by providing earthquake accessible berths including fireboat EFWS Hydrant
- Revitalize an underinvested area, connect residents and visitors to working fishing industry, and create a continuous waterfront experience
WHARF J9 REPLACEMENT & RESILIENT SHORELINE PROJECT

Draft Project Alternatives

Alt 1: Wharf J9 Only

Alt 2: Wharf J9 Only

Alt 3: Wharf J9 + Al Scoma Way

Alt 4: Wharf J9 + Al Scoma Way

Alt 5: Wharf J9 + Al Scoma Way + Jefferson Street

10
• Improve earthquake safety by retrofitting bulkhead wall and substructure to reduce damage and risk of collapse
• Provide reliable access across Seawall for use of berths for earthquake disaster response
• Due to difficulty in fixing Bay Muds, include major Seawall improvements as part of later SLR adaptation.
• Keep Exploratorium open during construction
PIER 15 BULKHEAD WALL & WHARF EARTHQUAKE SAFETY RETROFIT PROJECT

Draft Project Alternatives

Alt 1: Substructure Retrofits
- Strengthen bulkhead wall
- Wrap piles
- Improve pile and wall connections to deck

Alt 2: Widen Seismic Joint
- Widen existing seismic joint to handle Seawall movement
- Alt 1 substructure retrofits

Alt 3: Spider Frame
- New piles and substructure girders
- Design to be jackable for future sea level rise.
- High construction impacts make this unlikely.
PIER 9 BULKHEAD WALL & WHARF EARTHQUAKE SAFETY RETROFIT PROJECT

Project Vision: Objectives, Constraints, and Other Considerations

- Improve earthquake safety by retrofitting bulkhead wall and substructure to reduce damage and risk of collapse
- Provide reliable access across Seawall for use of berths for earthquake disaster response
- Due to difficulty in fixing Bay Muds, include major Seawall improvements as part of later SLR adaptation.
- Consider substructure deterioration in alternatives
- Advance shed retrofits as a separate project.
PIER 9 BULKHEAD WALL & WHARF EARTHQUAKE SAFETY RETROFIT PROJECT

Draft Project Alternatives

Alt 1: Substructure Retrofits
- Strengthen bulkhead wall
- Wrap piles
- Improve pile and wall connections to deck

Alt 2: Joint and Bldg
- Add a seismic joint to handle seawall movement
- Retrofits bulkhead building
- Include Alt 1 Substructure Retrofits

Alt 3: Spider Frame
- New piles and substructure girders
- Design to be jackable for future sea level rise
- Fixes deteriorated substructure conditions
FERRY BUILDING SEAWALL & SUBSTRUCTURE EARTHQUAKE RELIABILITY PROJECT

Project Vision: Objectives, Constraints, and Other Considerations

• Improve earthquake safety by strengthening the Seawall and substructure of the iconic Ferry Building

• Provide reliable earthquake disaster response for Ferry berths and staging areas by strengthening the Seawall and surrounding substructures

• Improve waterside public realm, reliability of utility services, and Near-term flood defenses

• Minimize construction impacts

• Develop a long-term adaptation plan and consider these investments as steps on the path
FERRY BUILDING SEAWALL & SUBSTRUCTURE EARTHQUAKE RELIABILITY PROJECT

High Complexity and Challenging Conditions

- Ferry Building is among the most complex areas of the waterfront to improve
- 100-foot-thick Bay Muds, a mix of structures dating from 1889, the 240ft clocktower, and BART tunnel below
- Substantial investment is likely needed to achieve earthquake objectives
- Initial seismic measures toolkit and eight different draft project alternatives developed, recommend advanced engineering to analyze performance
• Reduce near-term flood risk to multi-modal Embarcadero transit corridor, BART and Muni, and historic resources, while longer-term solutions are developed for earthquake stability and sea level rise
• Balance near-term flood risk reduction with larger adaptation moves.
• Maintain a high-quality public realm, fix flood damage & explore habitat enhancements
• Partner with SFPUC to include storm water management improvements.
• Consider deteriorated bulkhead and substructures
PIER 5 to 22½ NEAR-TERM COASTAL FLOOD RISK REDUCTION PROJECT

Draft Project Alternatives

Zone 1
Piers 5-1

Not recommended as first priority
Partner with long-term lease holders

Zone 2
Pier 1/2-Ag Building

Recommend coordination with, but not contingent upon, seismic improvements

Zone 3
Piers 14-22 1/2

Recommended for priority path
Stormwater risks require additional study
PIER 24½ to 28½ BULKHEAD WALL & WHARF EARTHQUAKE SAFETY RETROFIT PROJECT

Project Vision: Objectives, Constraints, and Other Considerations

• Improve safety in bulkhead zone and Promenade by reducing collapse risk
• Consider age, condition and rehabilitation needs.
• Include simple retrofits to full replacement alternatives
• Full replacement alternatives to be adaptable for SLR.
• Consider utility needs and adjacent Pier 30/32 and Pier 38/40 development projects
PIER 24½ to 28½ BULKHEAD WALL & WHARF EARTHQUAKE SAFETY RETROFIT PROJECT

Draft Project Alternatives

Alt 1 & 2: Retrofits
Simple structural retrofits that allow for wall movement without wharf losing vertical support. Include seismic joints to protect piers.

Alt 3: Replace Wharf
New wharf designed for high seismic performance and future elevation gain.

Alt 4: Stabilize Shoreline
Wall stabilization with resilient utility corridor. Potential link to shoreline improvements by Piers 30-32 and Piers 38 & 40 development projects.
Early Projects
Next Steps
NEXT STEPS

• Advance Alternatives Analysis for these projects and target first construction in 2024
• Continue to coordinate Pre-Design of Early Projects with development of Adaptation Strategies
• Seek additional funding opportunities to advance more Embarcadero Early Projects
Pilot Project - Living Seawall
Objective: ecological enhancement of seawalls

Study ecological growth on concrete using textured surfaces and concrete admixture composition

All frames and tiles are constructed

Permits received and installation is complete
LIVING SEAWALL

- June 2022 - Smithsonian did baseline survey of all species and organisms living on the seawall
- Two years of monitoring to begin early 2023

Photo: Lonny Meyer
Seawall Bond & Program Funding
## PROGRAM FUNDING SUMMARY

### Current Program Funding ($ millions)

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$58.7 million in current grant application submissions
# PROGRAM GO BOND EXPENDITURES

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Expenditures through 9/2022
## SECOND BOND REQUEST AND TOTAL BOND FUNDING

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Program Risks, Challenges, and Opportunities
RISKS, CHALLENGES AND OPPORTUNITIES

• FUNDING
  • Embarcadero Early Projects are projected to be $650 million to $3 billion
  • Southern Waterfront Early Projects and longer-term adaptation will significantly increase this need
  • The USACE Flood Study is the main avenue for funding beyond the Prop A Seawall Bond; a schedule delay or not completing/reaching a positive federal interest finding would significantly alter the scope of the Waterfront Resilience Program
  • Leveraging Prop A Seawall Bond funds to match federal grant opportunities from the IIJA and IRA
  • Ongoing high inflation reduces the impact of the available funds
RISKS, CHALLENGES AND OPPORTUNITIES

• CITY WIDE COLLABORATION
  • The Program impacts on many city-wide infrastructure. Strong ongoing inter-agency collaboration will be essential to success.
  • Solving multiple hazards in a holistic way will provide efficiencies for the City and help toward other City goals such as Climate Action goals.

• PUBLIC AND POLITICAL SUPPORT
  • Strong public and political support will be required to support the USACE Flood Study with selecting a locally preferred plan in 2023.
RISKS, CHALLENGES AND OPPORTUNITIES

• SCHEDULE
  • The program is in a race against time to implement as much risk mitigation before the next major earthquake or coastal flood

• ECONOMIC STIMULUS
  • Significant injection of federal funds into the City
  • Opportunity to revitalize the waterfront as a destination supporting long-term investment in adjacent areas
  • Opportunity for significant investment in historically underserved communities in the southern waterfront
Thank You

Brad Benson | brad.benson@sfport.com
Steven Reel | steven.reel@sfport.com
Carlos Colon | carlos.colon@sfport.com