The City and County of San Francisco is proposing a $425 million bond for the November 2018 ballot to fund improvements to theEmbarcadero Seawall that will reduce the significant life safety seismic risk, improve current flood protection and provide a stable foundation for future adaptation to sea level rise.
SAN FRANCISCO’S INVISIBLE SUPPORT

1850’s SHORELINE

LANDFILL

PRE-1906 SEAWALL

1906-1916 SEAWALL

MISSION CREEK

FISHERMAN’S WHARF
CRITICAL RISK: EARTHQUAKE SAFETY

72% PROBABILITY for a quake of at least 6.7 or GREATER magnitude to occur between NOW and 2032
CRITICAL RISK: CURRENT AND FUTURE FLOODING

• Seawall supports the Embarcadero and provides flood protection

• Current Embarcadero closures during king tide flooding

• Muni and BART tunnels subject to flood risk

• CCSF sea level rise guidance:
  12”-24” by 2050
  36”-66” by 2100
WHAT IS AT RISK?

THE SEAWALL IS A CRITICAL PART OF THE CITY’S NETWORK OF EMERGENCY RESPONSE

In the event of a major earthquake, the waterfront must be available for emergency response access. Ensuring the seismic reliability of the Seawall will allow the City to respond to a major disaster.

THE SEAWALL IS KEY TO REGIONAL TRANSPORTATION

440,000 people arrive daily by boat at the Ferry Building or through the Transbay Tube on BART.

In addition, the Muni Metro system registers over half a million daily boardings on routes that terminate downtown.

THE SEAWALL SUPPORTS AND PROTECTS IMPORTANT UTILITY INFRASTRUCTURE

This includes major wastewater, water, auxiliary water system, and power utilities.

$24.6B OF TOTAL ECONOMIC ACTIVITY AND $102.1B OF PROPERTY VALUE IS AT RISK FROM FAILURE OF THE SEAWALL

The value of assets at risk is 10–40x greater than the investment needed to strengthen the Seawall.
WHAT WILL THIS BOND FUND?

Address the most significant seismic and near-term flood risks to the most critical assets.

<table>
<thead>
<tr>
<th>INVESTMENT CATEGORY</th>
<th>EXAMPLE MEASURES TO BE INCLUDED AND EVALUATED</th>
</tr>
</thead>
</table>
| Project Implementation       | • Program Development, Planning & Pre-Design  
• Design, Engineering & Other Soft Costs  
• Construction Management       |
| Earthquake Improvements      | • Ground Strengthening & Liquefaction Remediation  
• Bulkhead Wall, Wharf & Pier Retrofits & Replacements  
• Bulkhead Building Retrofits and Seismic Joints  
• Pier Building Retrofits  
• Critical Facility Retrofits & Replacements  
• Utility Replacements, Relocations & Bypasses  
• Matching Funds for Public & Private sources  
• Other Life Safety Improvements |
| Flood Protection Measures    | • Flood Walls & Barriers  
• Surface Grade Changes  
• Flood Proofing  
• Planning for Future Adaptation  
• Enhanced Foundation for Future Adaptation  
• Other Flood Control Improvements |
| Mitigation & Enhancement     | • Public Access Enhancements  
• Transportation/Mobility Improvements  
• Environmental Benefits  
• Other Public Benefits |
EARTHQUAKE RETROFIT CONCEPTS

**OPTION 1 GROUND IMPROVEMENT**

STABILIZE LAND + SEAWALL

**OPTION 2 GROUND IMPROVEMENT UNDER SEAWALL**

STABILIZE LAND UNDER SEAWALL + RETROFIT WHARF

**OPTION 3 BULKHEAD REPLACEMENT**

RELOCATE HISTORIC BUILDING + REBUILD WHARF

**OPTION 4 NEW BAYWARD SEAWALL**

INSTALL NEW SHEET PILES WITH STRENGTHEN FILL
POTENTIAL SEA LEVEL RISE SOLUTIONS

+6' SEA LEVEL RISE
+3' SEA LEVEL RISE
CURRENT WATER LEVEL

RAISE/EXPAND LANDSCAPE EDGE
SAMPLE EVALUATION CRITERIA

Life Safety

Emergency Response

Implementation Timeframe  Risk Avoided  Community and Social Benefits  Environmental Benefits

Minimize Disruption and Construction Impacts
Phase I – Strengthen the Seawall for Public Safety
• Near-term actions to address life-safety and emergency response and recovery. Planning and actions taken 2017-2026.

Phase II – Adapt to Mid-Century Risks
• Mid-range plans to advance seismic and flood projects to provide greater reliability and stability to the waterfront. Actions estimated between 2026-2050.

Phase III – Envision the Waterfront 2100
• Long-term vision. Actions estimated between 2050-2100.
Program Management

Preliminary Design & Environmental Approvals, Phase I Projects, $25m

Life Safety and Pilot Projects, $75m

Final Design & Construction, Phase I Projects, $385m

USACE CAP 103 (Near Term Flood Protection Project), $6m

Data Collection & Field Investigations

Multi-Hazard Risk Assessment

Alternatives Development & Analysis

Selection of Phase 1 Projects

Development of Overall Program

Design & Engineering to 35%

NEPA & CEQA

Solicitation of Contractors (DBB, DB, CMGC)

Critical life safety projects

Final Design & Engineering

Construction & CM

Permits

Feasibility Study

Project Partnership Agreement

Design & Construction

Stakeholder Engagement

Phases:
- 2018-2019: Preliminary Design & Environmental Approvals, Phase I Projects
- 2020-2021: Final Design & Construction, Phase I Projects
- 2022: USACE CAP 103 (Near Term Flood Protection Project)
- 2023: Program Management
- 2024: Life Safety and Pilot Projects
- 2025-2026: Stakeholder Engagement

Total Costs:
- Program Development/Planning, $14m
- Preliminary Design & Environmental Approvals, $25m
- Life Safety and Pilot Projects, $75m
- Final Design & Construction, Phase I Projects, $385m
- USACE CAP 103, $6m

Note: The diagram shows a detailed schedule with timelines and milestones for each phase.
<table>
<thead>
<tr>
<th>FUNDING SOURCES</th>
<th>FISCAL YEAR ($ in millions)</th>
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<tbody>
<tr>
<td></td>
<td>16/17</td>
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<tr>
<td>Port Capital</td>
<td>$2.9</td>
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<tr>
<td>City Revolving Fund</td>
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<td>SFMTA Contribution</td>
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<tr>
<td>Planning Department Contribution</td>
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<td>2018 General Obligation Bond</td>
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<tr>
<td>USACE</td>
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<tr>
<td>State Sources</td>
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<tr>
<td>Total Planned Sources</td>
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<tr>
<td>Cumulative Sources</td>
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*pending legislative action
# PROJECT SCHEDULE, PHASES & FUNDING

<table>
<thead>
<tr>
<th>PROGRAM PHASE</th>
<th>PHASE YEARS (FY)</th>
<th>PLANNED ACTIVITIES</th>
<th>FY SPENDING ($ in millions)</th>
<th>CUMULATIVE COST ($ in millions)</th>
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<tr>
<td>Vulnerability Study</td>
<td>15/16</td>
<td>Vulnerability Study</td>
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<td>Planning</td>
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<td>22/23 23/24 24/25 25/26 26/27</td>
<td>Project Management &amp; Stakeholder Engagement Final Design Design Support Services Construction Management Construction</td>
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<td>$204.6  $295.1  $385.5  $475.9  $500.0</td>
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## Proposed Bond Issuance

<table>
<thead>
<tr>
<th>Sources:</th>
<th>Issuance #1</th>
<th>Issuance #2</th>
<th>Issuance #3</th>
<th>Total</th>
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<tbody>
<tr>
<td>Par Amount</td>
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<td>$190,000,000</td>
<td>$125,000,000</td>
<td>$425,000,000</td>
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<tr>
<td>Total Sources:</td>
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<tr>
<td>Uses:</td>
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<td>Project Fund Deposits:</td>
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<td>Project Fund</td>
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<td>Underwriter’s Discount</td>
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<td>CGOBOC Fee</td>
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<tr>
<td>Total Uses:</td>
<td>$110,000,000</td>
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PATH TO THE BALLOT BOX

Port Commission
April 10

Capital Planning Committee
April 16

Board of Supervisors
May

November Ballot
QUESTIONS?