



WATERFRONT RESILIENCE PROGRAM UPDATE

Port Commission Agenda Item #11

June 14, 2022



AGENDA



- Draft Waterfront Adaptation Strategies development process
- Community-driven resilience
- Adaptation approaches
- Next steps

WATERFRONT RESILIENCE PROGRAM VISION STATEMENT

Affirmed through Robust Community Engagement

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 EFFORTS

Program and City Resilience Projects and Efforts

PORT-WIDE

- Adapt Plan
- USACE Coastal Flood Study
- Floodproofing the Piers
- Waterfront Adaptation Strategies

1

EMBARCADERO

- Embarcadero Seawall
- Multi-Hazard Risk Assessment
- Early Projects
- Living Seawall Pilot

2

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



STRATEGIC OBJECTIVES

The Waterfront Resilience Program Supports the Goals of the Port's Strategic Plan



- Engagement
- Equity
- Resiliency
- Evolution
- Sustainability
- Productivity and Economic Recovery

WATERFRONT WIDE FLOOD HAZARDS

Coastal Flood Risk - 2100



WATERFRONT WIDE FLOOD HAZARDS

Coastal Flood Risk - 2150



PLANNING FOR SEA LEVEL RISE



AVERAGE HIGH WATER LEVEL
BY 2100
(higher estimate)

approx. 7'

aprox. 2.13m 大約2.13公尺

NIVEL ALTO PROMEDIO DEL AGUA
PARA EL 2100
(estimación más alta)
2100年時的平均高水位
(較高估計)

approx. 3.5'

aprox. 1.05 m 大約1.05公尺

AVERAGE HIGH WATER LEVEL
BY 2100
(most likely scenario)

NIVEL ALTO PROMEDIO DEL AGUA
PARA EL 2100
(situación más probable)
2100年時的平均高水位
(最可能的情况)

approx. 0.6'

aprox. 0.18 m 大約0.18公尺

CURRENT AVERAGE HIGH WATER LEVEL
(Sea level rise since 2000 – ~7")

ACTUAL NIVEL ALTO PROMEDIO DEL AGUA
目前平均高水位

RISING TO THE CHALLENGE

San Francisco faces urgent seismic and increasing coastal flood risks today



San Francisco, 1906



Market Street, 1906



Marina, 1989



The Embarcadero



Pier 94-96



Recology



Islais Creek outfall
and Marin St.

RISING TO THE CHALLENGE

Adaptation should preserve and reimagine San Francisco's waterfront





Draft Waterfront Adaptation Strategies Development Process

LADY FISH
SAN FRANCISCO, CA

BESHA II
SAN FRANCISCO



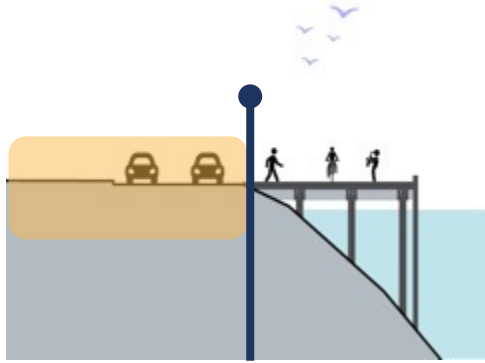
DRAFT WATERFRONT ADAPTATION STRATEGIES

A key part of the WRP's work



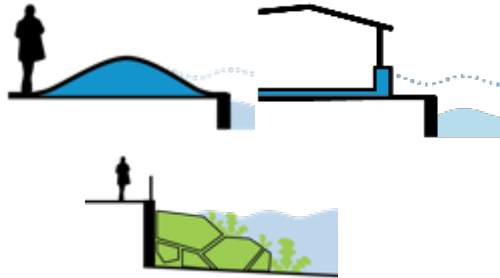
DRAFT WATERFRONT ADAPTATION STRATEGIES

Key Components



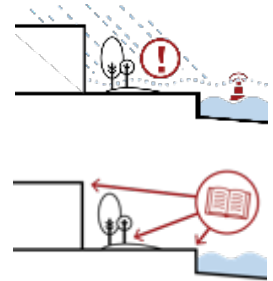
Coastal Flood Defense Location + Height

*And area of elevation
change*



Physical Changes

*Such as earthquake-
resilient berms,
floodproofing, and
nature-based features*



Policy Changes

*Such as resilient codes,
warning systems, and land
use changes*

PHASING

Implementation over time, building on previous investments

Early Projects

Focus of Draft Waterfront Adaptation Strategies

Mid-Term Adaptations

Long-Term Adaptations

Future Adaptations
...

Today

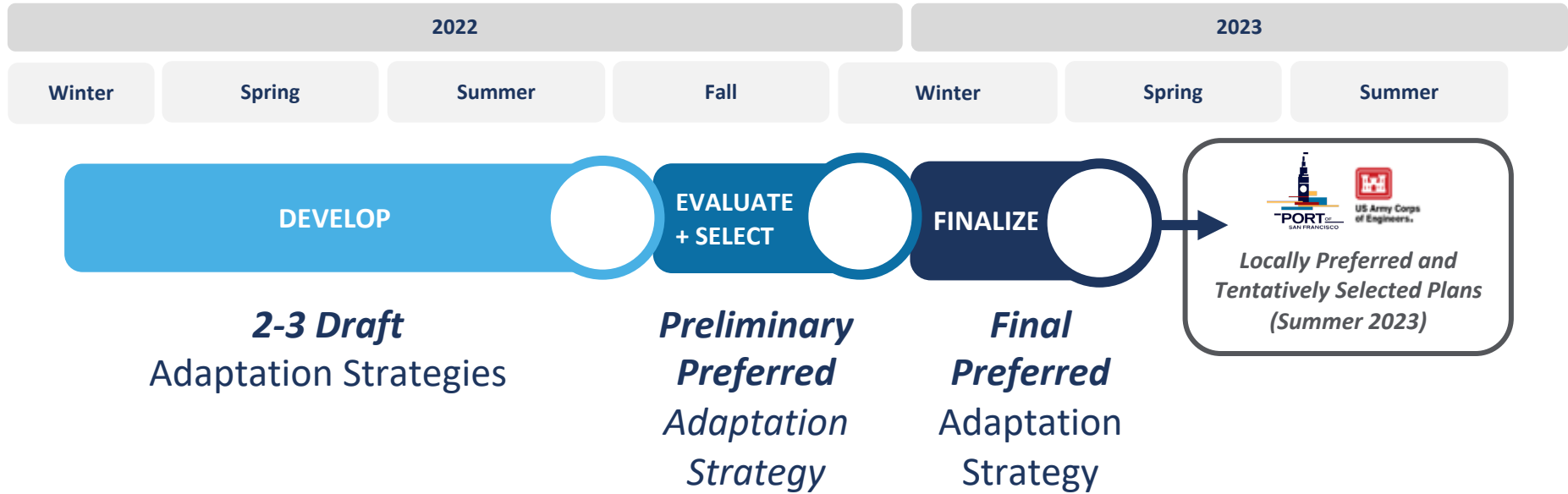
2050

2100

2150

sea level rise

DRAFT WATERFRONT ADAPTATION STRATEGIES DEVELOPMENT SCHEDULE



ONGOING CITY ENGAGEMENT

What We've Heard – Key Themes

- Importance of **maintaining functioning assets** and connections to system-wide networks
- Understand and design for **implications to stormwater system** in relation to the coastal flood defenses
- Develop and promote projects with **multiple benefits**, such as jobs, open space, mobility, habitat/ecology, and access to the waterfront
- Flood defense infrastructure enhances **seismic reliability** and **disaster response**





Community-Driven Resilience



WRP COMMUNITY AND STAKEHOLDER ENGAGEMENT

Community / Advisory Group Engagement



COMMUNITY GROUPS

Coordinated over 150+ community and stakeholder group presentations



WATERFRONT-WIDE

Presentations to people along the entire waterfront, including Embarcadero, Mission Creek / Mission Bay, 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 WRP



KEY PARTNERSHIPS

Partnerships with dozens of groups, including Rec & Park, Cal Academy, WorldWideWomen Girls' Festival, and more



HOSTED EVENTS

The Port has hosted a series of walking tours along Islais Creek, and is planning walking tours for Mission Bay and along the Embarcadero

WRP COMMUNITY AND STAKEHOLDER ENGAGEMENT

Digital Engagement

It's Your Turn: Map Your Priorities Along the Waterfront

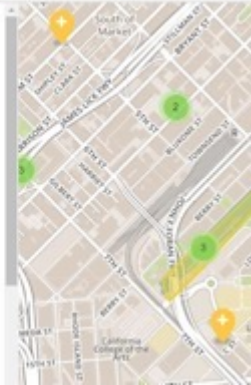
Waterfront Assets Mapping Exercise

We want to hear from you! In three simple steps, inform how we prioritize and define projects along our waterfront.

1. Below is a map of the San Francisco waterfront, showing the Port and the Embarcadero Seawall - the Seawall is over three miles long. Take a moment to check-out the map.

2. We've placed life safety and disaster response pins on the map already within the three miles of the Seawall - these are important sites and are vital for our city's disaster response and recovery.

3. Now it's your turn! Share on to these



ASSET MAPPING

We asked the public what they value most along the waterfront to inform how we prioritize and define projects

It's Your Turn: Provide Feedback on the Waterfront Resilience Program Vision, Principles, and Evaluation Criteria

Help us shape the Port of San Francisco's Waterfront Resilience Program by providing feedback on the Program Vision, Principles, and Evaluation Criteria. Your insights and feedback are invaluable as the Port thinks both short and long term about the waterfront. **Please provide your feedback through this short survey.**

The Port's Waterfront Resilience Program ensures the City of San Francisco's bay-side waterfront is protected from hazards including earthquakes, flooding, and sea level rise due to climate change. The Program includes the Embarcadero Seawall Program and the USACE-Port Flood Study. The Port's Waterfront Resilience work is an inclusive effort that aligns with many different initiatives. More information on the Waterfront Resilience Program can be found [here](#).

Thanks for participating!

This survey was shared at Seawall Community Meeting #4 in June 2019. Couldn't attend but want to learn more? View the Community Meeting presentations [here](#) and the meeting recap [here](#).

[SURVEYS & FORMS](#)



ONGOING FEEDBACK

We asked what the public thinks about draft WRP Values, Goals and Evaluation Criteria language in English, Spanish, and Chinese

Envision the Future Waterfront

CHECK OUT THE MAP OF THE WATERFRONT. Find the Giant's ballpark, the Exploratorium, a Park. See if you can find the Embarcadero Seawall!

Now, think about what you want to see along the waterfront in the future...



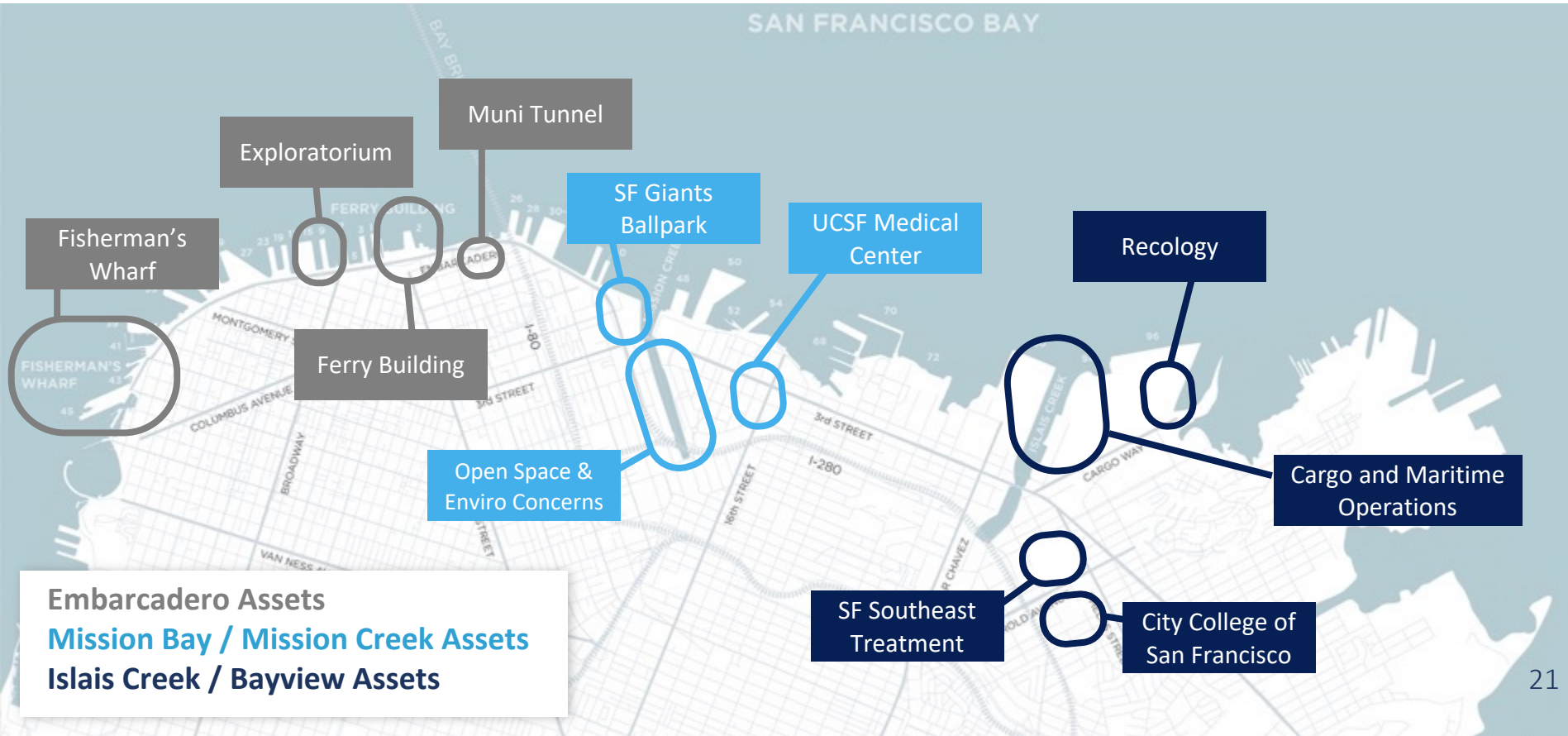
Survey starts

VISIONING

We asked what the public wants to see along the waterfront in the future...

WRP COMMUNITY AND STAKEHOLDER ENGAGEMENT

Assets Communities Want to Protect



WATERFRONT FUTURE VISIONS – WHAT WE’VE HEARD



Regional partnerships and solutions

More/better transportation options

Connected city, bay, and region

Bring people and nature to the waterfront

Protect homes in place, prioritize low-income and affordable **housing**

Preserve and enhance equity and diversity of **jobs** **Equitable** opportunities

Social and economic sustainability

Achieve the future we **envision**

WATERFRONT FUTURE VISIONS – WHAT WE’VE HEARD

Ecological adaptation measures

Cleaner and greener

Connect people to nature

Healthy ecosystems and open space



Ferry Building



Embarcadero Promenade



Fisherman's Wharf



Pier 94 Wetlands



Mission Creek

Continuous, accessible waterfront for all people

A vibrant public waterfront

Equitable, direct access to water and open space

Integrate the **historic and maritime** waterfront with new public space

DRAFT WATERFRONT RESILIENCE PROGRAM GOALS

Affirmed through Robust Community Engagement



Goal 1

Improve life safety and disaster response and recovery capabilities



Goal 2

Increase seismic resilience



Goal 3

Increase resilience to current and future sea level rise



Goal 4

Protect the Port's Public Trust and Cultural Resources



Goal 5

Reduce risks to utility and transportation systems



Goal 6

Improve the environment



Goal 7

Achieve equity and increase benefits to the community



Goal 8

Improve economic opportunities and financial stability

Adaptation Approaches



ADAPTATION APPROACHES



DEFEND

Keep coastal water out,
stay in place



ACCOMMODATE

Let coastal water in,
stay in place

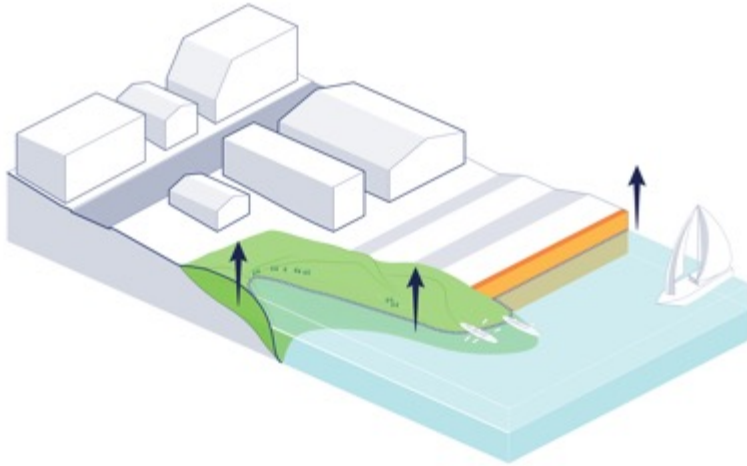


RETREAT

Move out of the area
over time

DEFEND

Keep coastal water out, stay in place



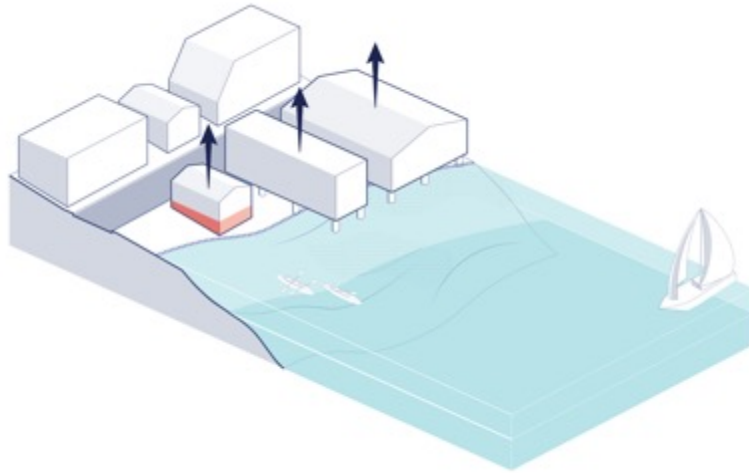
Defend against floods by raising the shoreline to keep the coastal water out



Elevated seawall and new public promenade in Auckland, NZ

ACCOMMODATE

Let coastal water in, stay in place



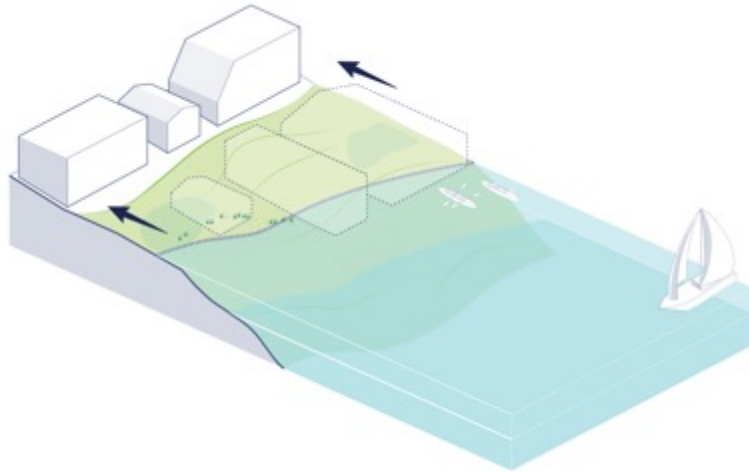
Accommodate flooding by letting the water in, adapting buildings and infrastructure in place



Elevated buildings, floodproofed lower levels, and floodable spaces in Hamburg, Germany

RETREAT

Move out of the area over time

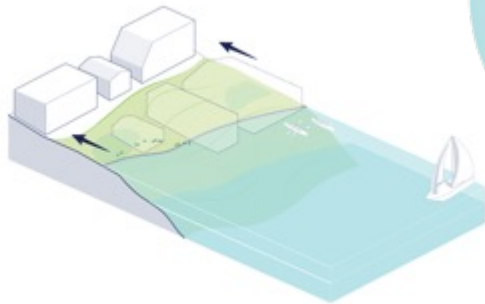
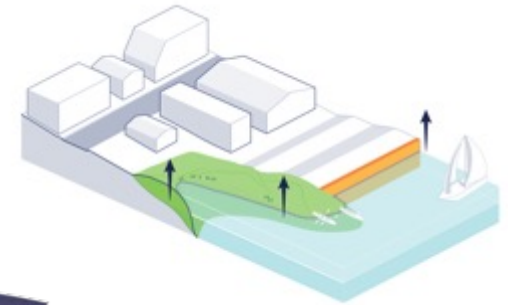
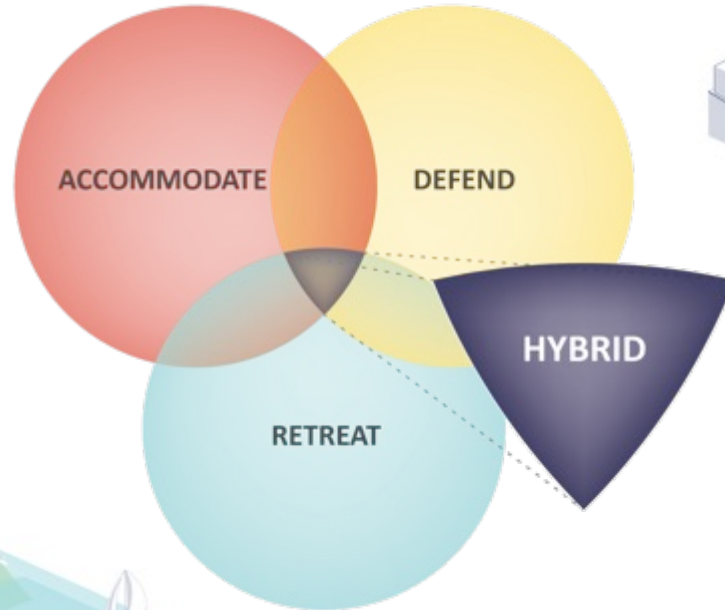
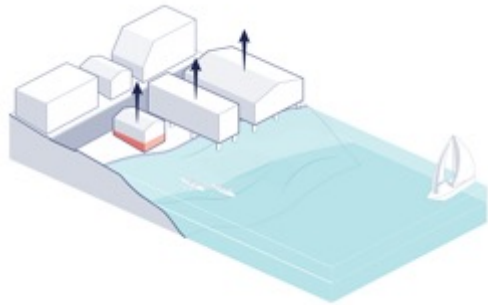


Retreat from the current shoreline by moving buildings and infrastructure inland



Repurposed land for public parks after an earthquake in Christchurch, New Zealand

ADAPTATION APPROACHES



NATURE-BASED SOLUTIONS



PUBLIC FEEDBACK ON ADAPTATION APPROACHES

Citywide survey results

The Port of San Francisco Sponsored

三藩市海濱區應做出哪些改變才能抵禦海平面上升帶來的問題？請參加三藩市港的海濱區復原計劃調查並提供您的寶貴意見。問卷調查網址是：<https://sfport.com/wrp/waterfront-survey>。您的意見將用於協助制定海濱區因應策略，解決洪水與地震風險。

surveymonkey.com
請參加三藩市港的海濱區復原計劃調查 [Learn More](#)

The Port of San Francisco Sponsored

¿Cómo debería adaptarse la costa de la bahía de San Francisco para ser más resiliente contra el aumento del nivel del mar? Dé sus impresiones por medio de la Encuesta del Programa de Resiliencia de la Costa de la Bahía del Puerto de San Francisco. Las impresiones apoyarán la creación de Estrategias de Adaptación para Toda la Costa de la Bahía para abordar los riesgos de inundaciones y terremotos.

surveymonkey.com
Encuesta del Programa de Resiliencia de la Costa d... [Learn More](#)

Help Shape the Future of San Francisco's Waterfront

協力打造三藩市濱水區的未來

Please place the colored dots according to your feelings.
請根據您的感受來放置彩色圓點。

- Fully support 全力支持
- SomeWHAT support 有限支持
- Do not support 不支持

How much would you support the DEFEND approach that raises the existing shoreline to keep the water out? 您多支持防禦方法：提高現有海岸線以防止海水滲入？

How much would you support the ACCOMMODATE approach by letting the water in, adapting buildings and infrastructure in place? 您多支持因應方法：讓海水流入，隨著時間讓這內陸的建築物和基礎設施？

How much would you support the RETREAT approach that entails retreating from the current shoreline by moving buildings and infrastructure inland over time? 您多支持撤退方法：隨著時間將建築物和基礎設施移至內陸，從目前海岸線撤退？

Thank you for your input. Your answers will help the City identify challenges to take on and implement a plan to address. For more information and opportunities, please contact us at info@sfport.com.
感謝您對這項調查的貢獻。您的回答將幫助我們了解城市面臨的挑戰，並制定計劃以解決這些問題。如需更多資訊和機會，請與我們聯繫，電話：(415) 774-3333 或 info@sfport.com。

Have ideas to say? [Click here to share your ideas.](#)
請分享更多意見？ [Click here to share your ideas.](#)

- Survey presented 5 examples of how other cities made changes and asked respondents to consider for San Francisco's waterfront:
- **Defend** – feels familiar, minimizes changes ... blocks views, costly, construction
- **Accommodate** – practical, reasonable, flexible ... construction, costly, need more info
- **Retreat** – proactive, open space ... displacement, unrealistic, who gets moved?

NEXT STEPS

Upcoming Waterfront Resilience Program Activities



- 2-3 Draft Waterfront Adaptation Strategies will be ready this fall, followed by robust community engagement
- Embarcadero early projects are in predesign
- Living Seawall Pilot underway
- Engineering with Nature and historic preservation experts, regulatory agencies, equity practitioners, and community based organizations to inform Adaptation Strategies

Thank You!

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Waterfront Resilience Program

