DRAFT WATERFRONT ADAPTATION STRATEGIES

Embarcadero Community Meeting

November 15, 2022

WELCOME

What to Expect

- Intros
- 45 min Presentation with Polls – we want to hear from you!
- 30 min Q&A – through the Chat or the “Raise Your Hand” function

VIDEO TO INTRODUCE DRAFT WATERFRONT ADAPTATION STRATEGIES

FRIENDLY REMINDERS

- Keep your device on mute unless you are speaking
- Use the chat function for quick feedback or to comment
- Use the “Raise Your Hand” function to indicate a request to speak
- Try not to talk over others
- Give each other time to gathers thoughts and comment before jumping in

TODAY'S AGENDA

Presentation Overview

- Understanding the Risks
  - *What we're facing*
- Waterfront Resilience Program
  - *What we're doing*
- Community Priorities
  - *What we've heard*
- Range of Possibilities
  - *What we're considering*
- Draft Waterfront Adaptation Strategies in the Embarcadero
- Next Steps
- Q&A

LAND ACKNOWLEDGEMENT

The Port of San Francisco acknowledges that we are on the ***unceded ancestral homeland of the Ramaytush Ohlone*** who are the original inhabitants of the San Francisco Peninsula.

As the indigenous stewards of this land and in accordance with their traditions, the Ramaytush Ohlone have never ceded, lost nor forgotten their responsibilities as the ***caretakers of this place***, as well as for all peoples who reside in their traditional territory.

As guests, we recognize that we benefit from living and working on their traditional homeland.

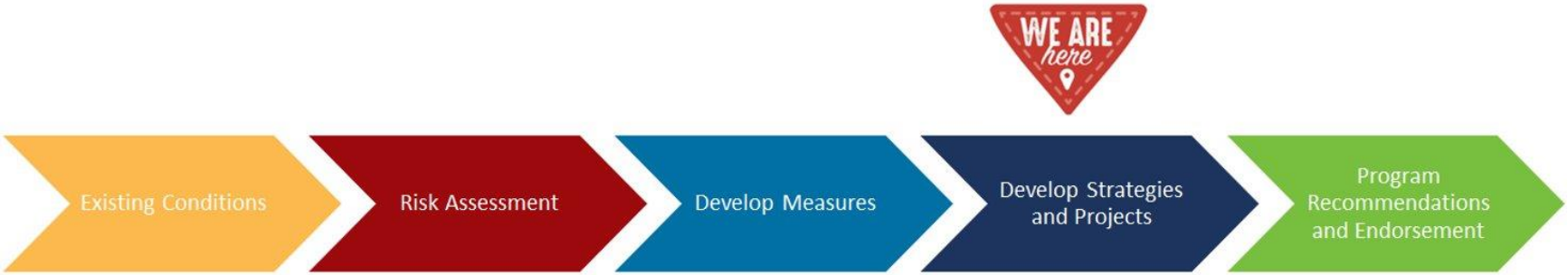
We wish to ***pay our respects*** by acknowledging the Ancestors, Elders and Relatives of the Ramaytush Community and by ***affirming their sovereign rights as First Peoples.***

POLL QUESTION #1

What part of the Embarcadero waterfront do you visit most often?

DRAFT WATERFRONT ADAPTATION STRATEGIES

Presentation Overview



The Port of San Francisco has developed seven high-level Draft Waterfront Adaptation Strategies through a collaborative interagency process and over five years of public engagement.

The draft Strategies are ready for public feedback, with a goal of reaching a Draft Waterfront Adaptation Plan by Summer 2023.

DRAFT WATERFRONT ADAPTATION STRATEGIES

Port-led, City of San Francisco Agencies, and USACE Partnered in Development Process

SAN FRANCISCO WATERFRONT COASTAL FLOOD STUDY

The Port and U.S. Army Corps of Engineers (USACE) are conducting a **waterfront coastal flood study** for San Francisco, which could result in **significant federal funding for flood risk reduction.**

This funding could also **improve shoreline stability** where USACE would fund coastal flood defenses and **provide other community benefits** that are part of a cost-effective plan. The Port and City have goals to further improve seismic resilience and provide other community benefits that will not be eligible for USACE funding.

Understanding the Risks

What We're Facing

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Waterfront Resilience Program

CLIMATE CHANGE HAS GLOBAL IMPACTS

Including Here In San Francisco


Puerto Rico, September 2022 / Alejandro Granadillo/AP


Alaska, September 2022 / adn.com


Florida, September 2022 / NYTimes.com


The New-York Times

An Earthquake in Japan Speaks to a Sea Wall in San Francisco

The challenges of climate change are everywhere but maybe no more so than in coastal cities that face dual threats of seismic activity and rising seas.


San Francisco Chronicle

S.F.'s Embarcadero needs to be raised as much as 7 feet to prepare for sea level rise, city says

RISING TO THE CHALLENGE

San Francisco Faces Urgent Seismic, Coastal, and Inland Flood Risks Today

SEISMIC RISKS

San Francisco, 1906

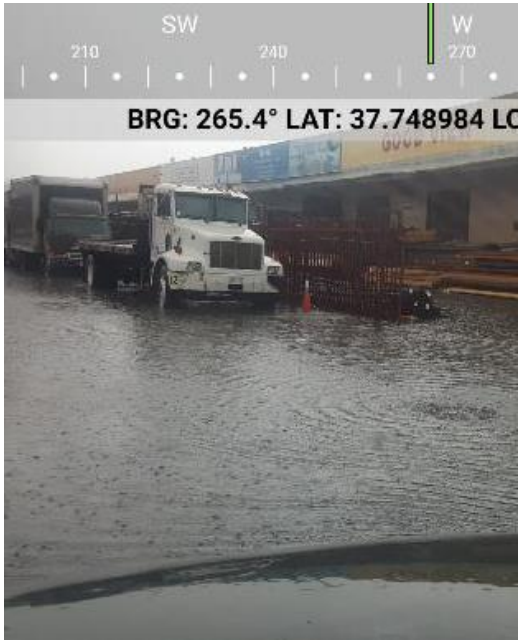
Marina, 1989

COASTAL FLOODING

Recology

The Embarcadero

INLAND FLOODING



Islais Creek outfall and Marin St.

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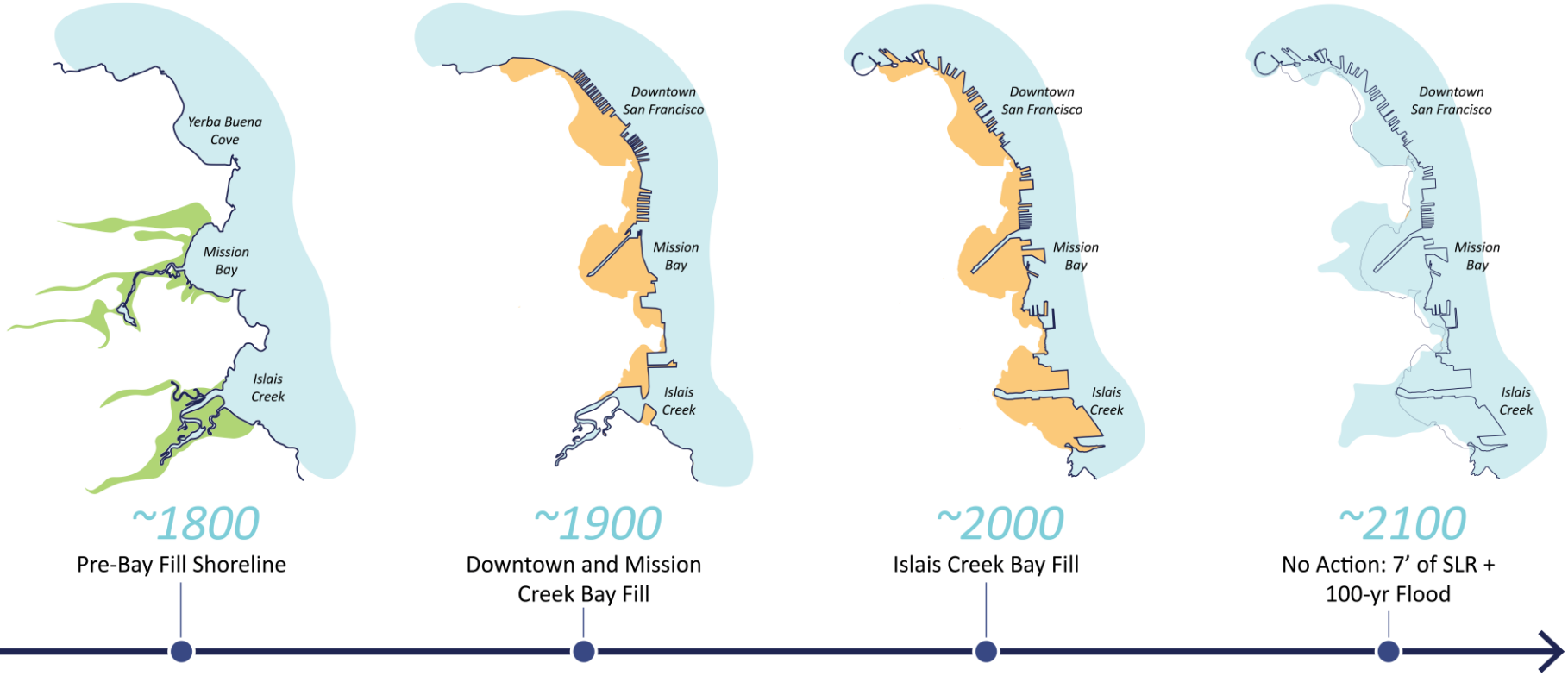
HISTORIC SHORELINE + BAY FILL

From the 1800s



~1800
Pre-Bay Fill Shoreline

~1900
Downtown and Mission Creek Bay Fill

~2000
Islais Creek Bay Fill

~2100
No Action: 7' of SLR + 100-yr Flood

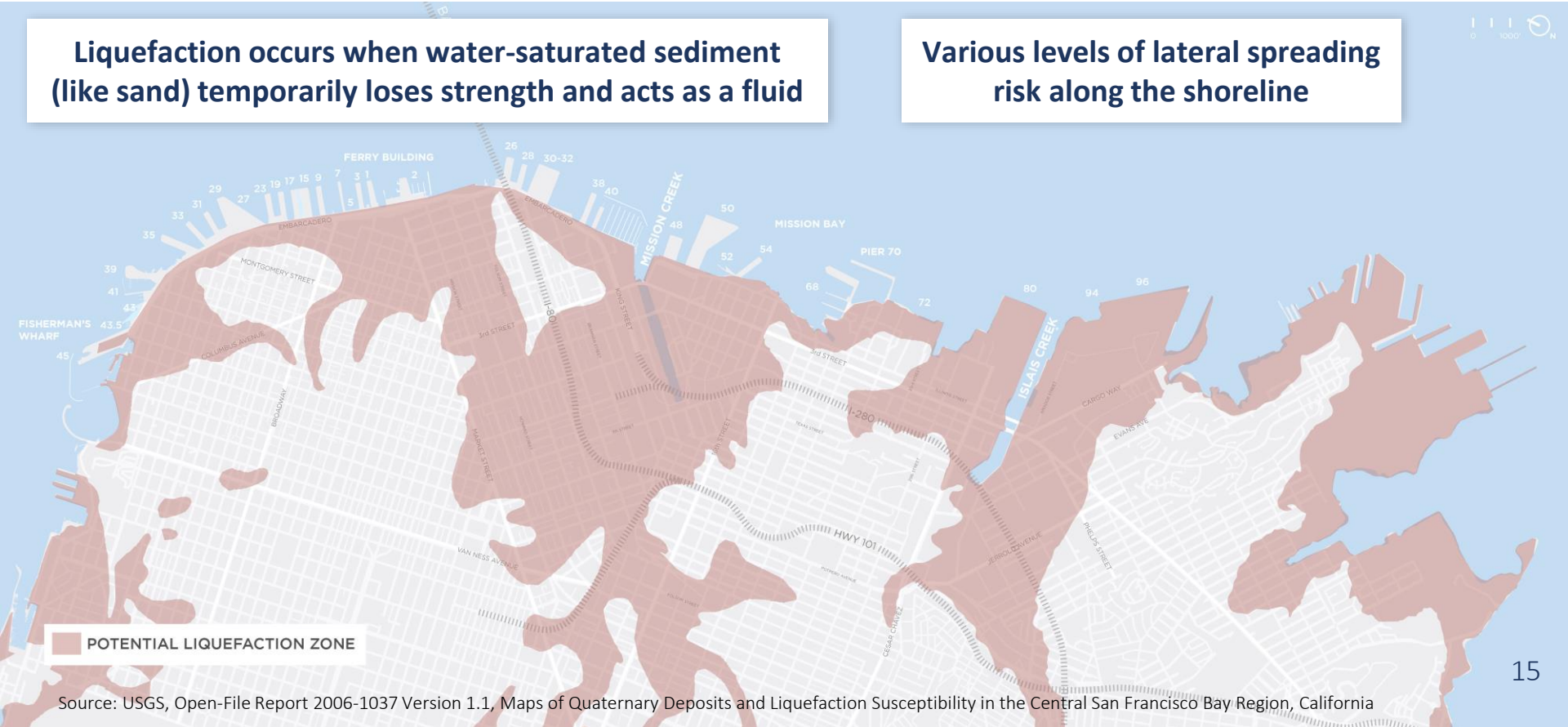
Marsh **Bay Fill**

WATERFRONT WIDE EARTHQUAKE HAZARDS

Very High Earthquake “Liquefaction” Risk

Liquefaction occurs when water-saturated sediment (like sand) temporarily loses strength and acts as a fluid

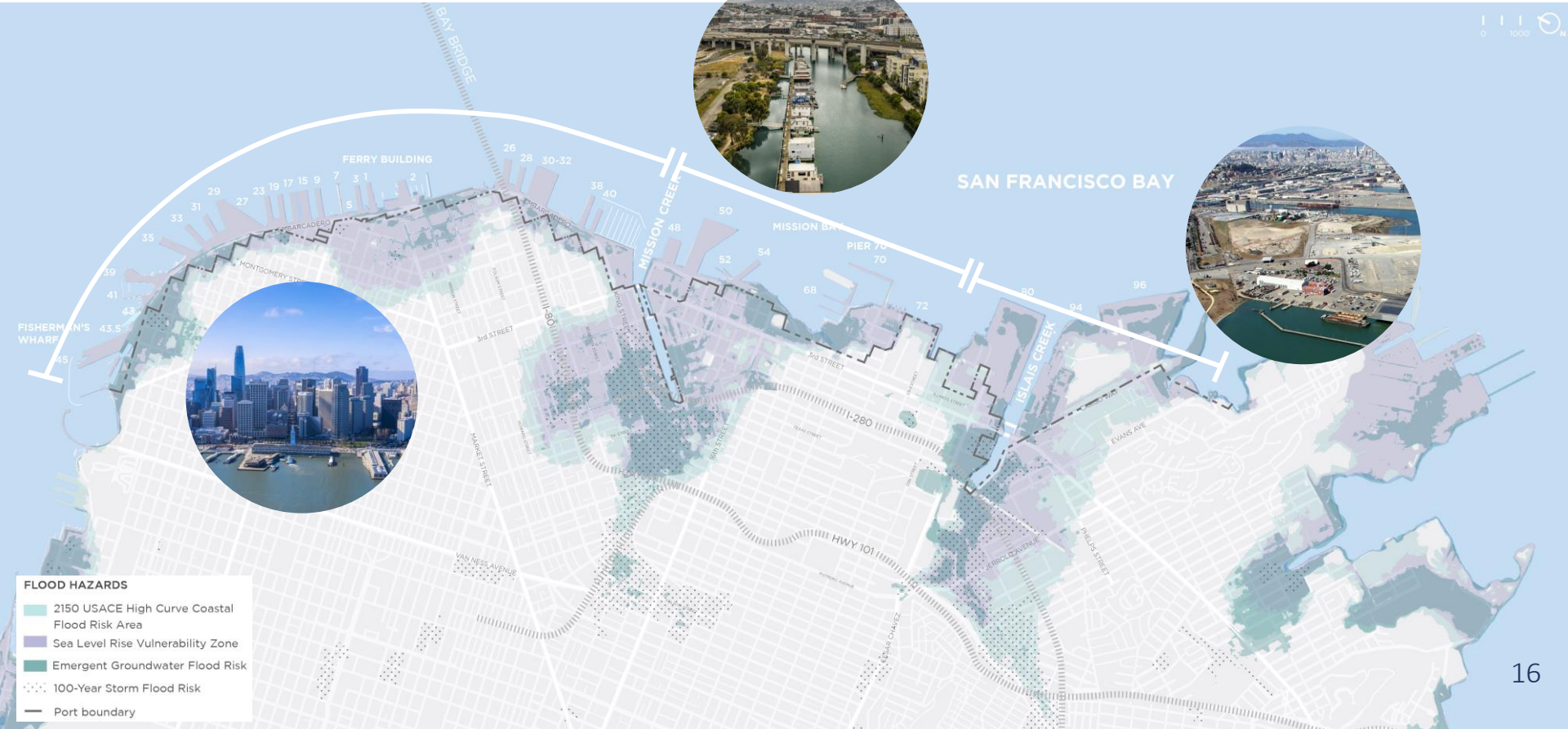
Various levels of lateral spreading risk along the shoreline



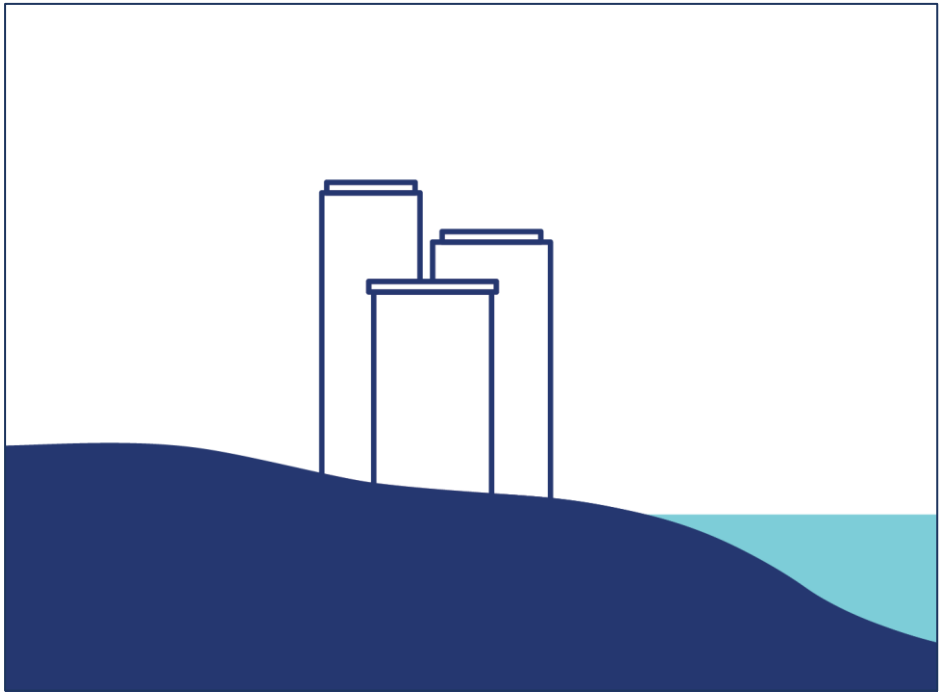
Source: USGS, Open-File Report 2006-1037 Version 1.1, Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California

COASTAL AND INLAND FLOOD RISK

Different Geographic Impacts

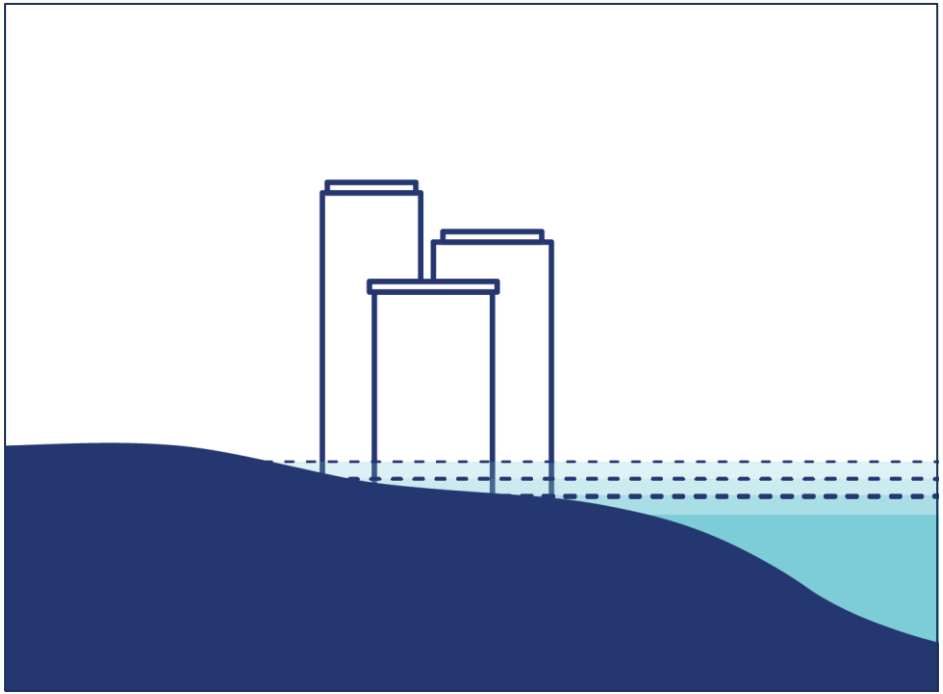


COASTAL AND INLAND FLOOD RISK



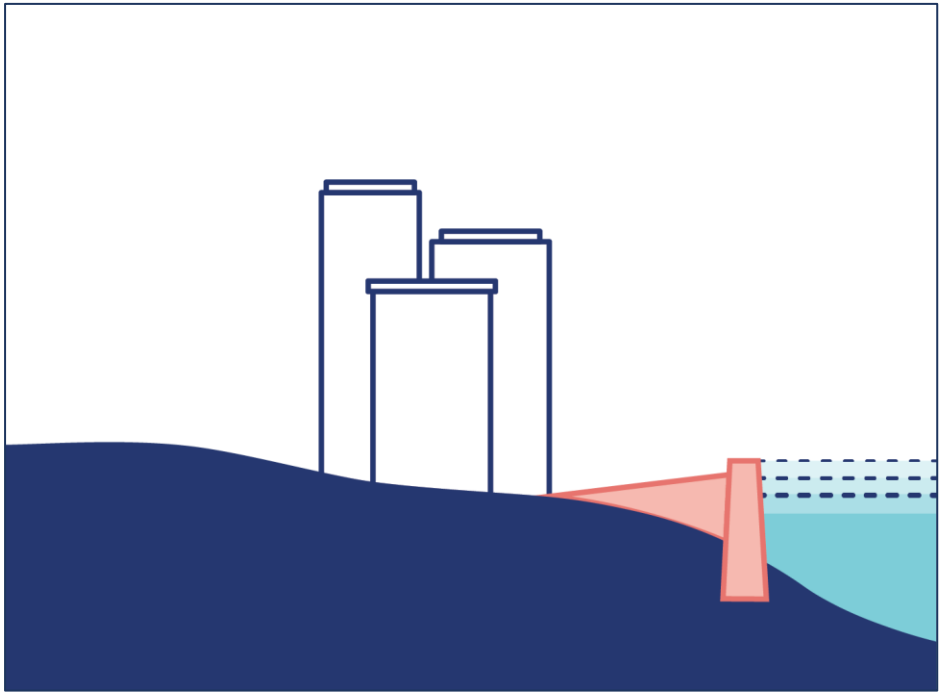
Existing conditions

COASTAL AND INLAND FLOOD RISK



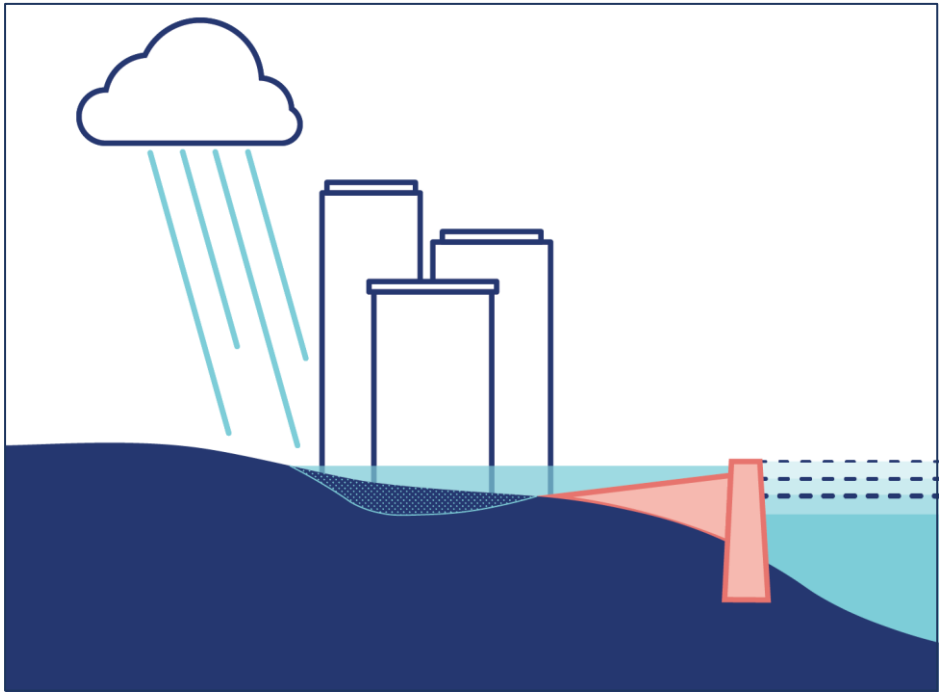
Sea levels rise

COASTAL AND INLAND FLOOD RISK



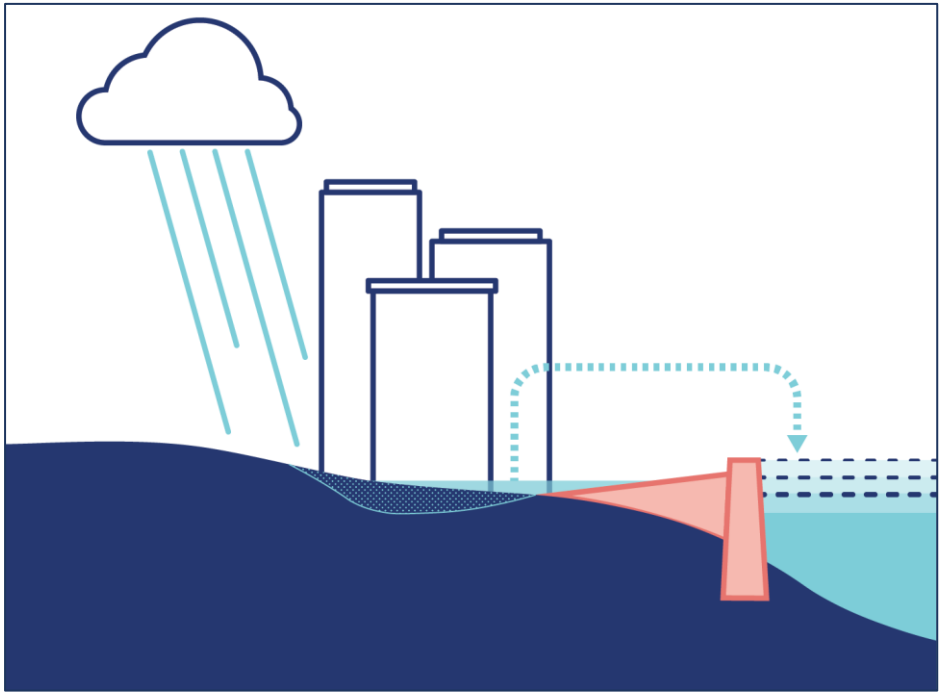
Raise shoreline to defend against sea level rise

COASTAL AND INLAND FLOOD RISK



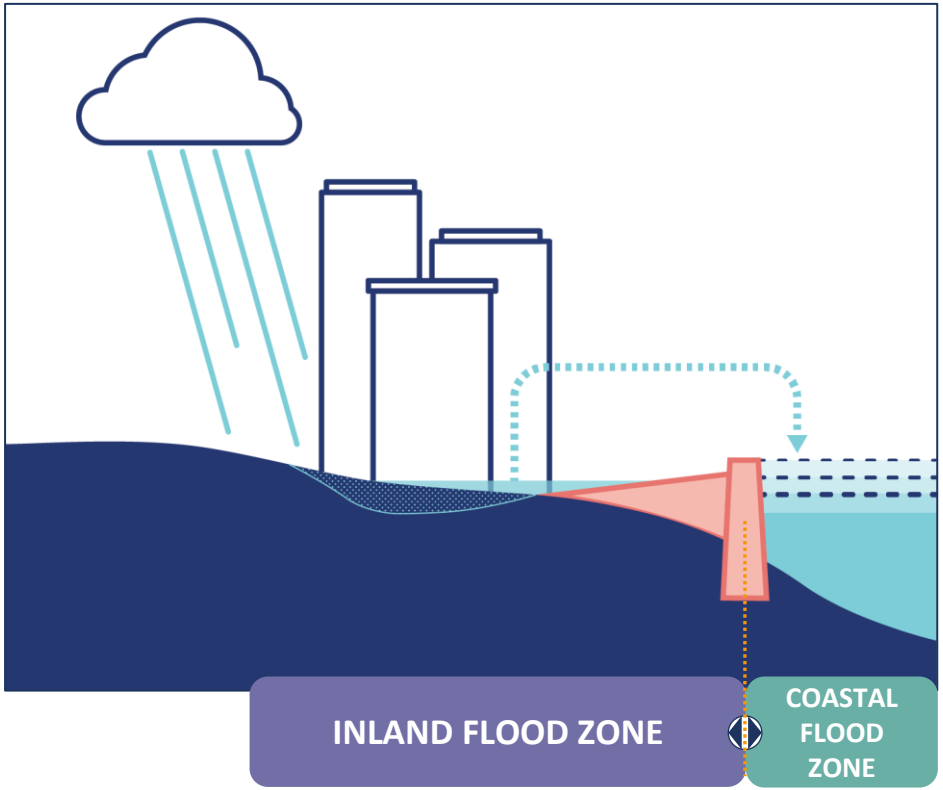
Groundwater and stormwater flooding behind raised shoreline

COASTAL AND INLAND FLOOD RISK



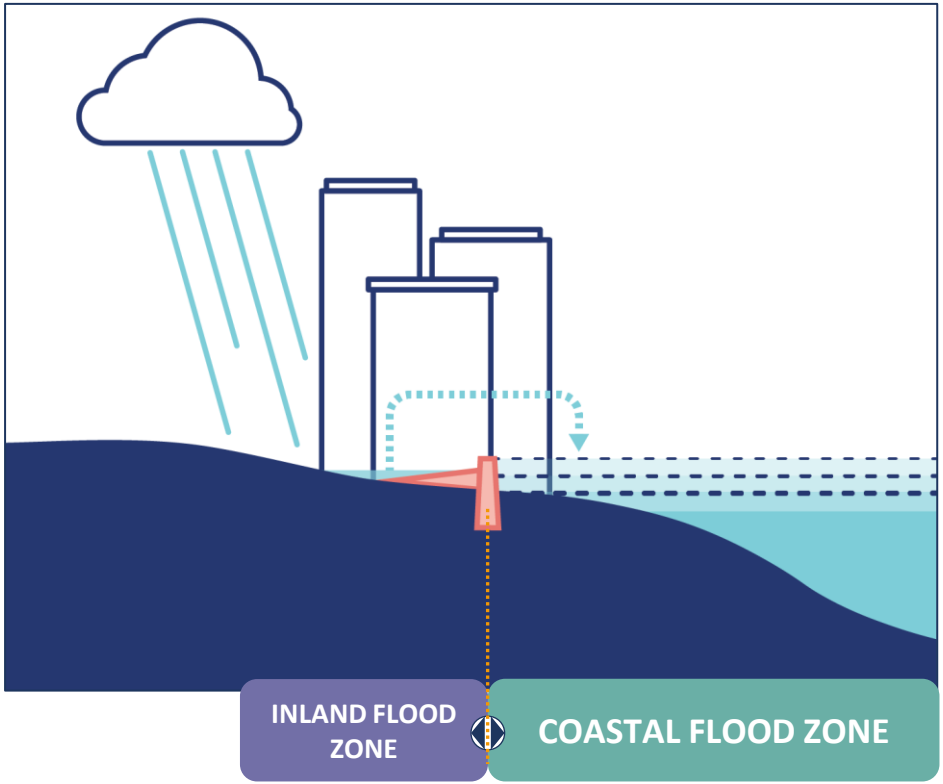
Pumping reduces flooding behind raised shoreline

COASTAL AND INLAND FLOOD RISK



Two related forms of flooding

COASTAL AND INLAND FLOOD RISK



Shift based on the location of flood protection

Any solution endorsed by the City of San Francisco will aim to address **all three risks:**
seismic risks, coastal flooding and inland flooding.

POLL QUESTION #2

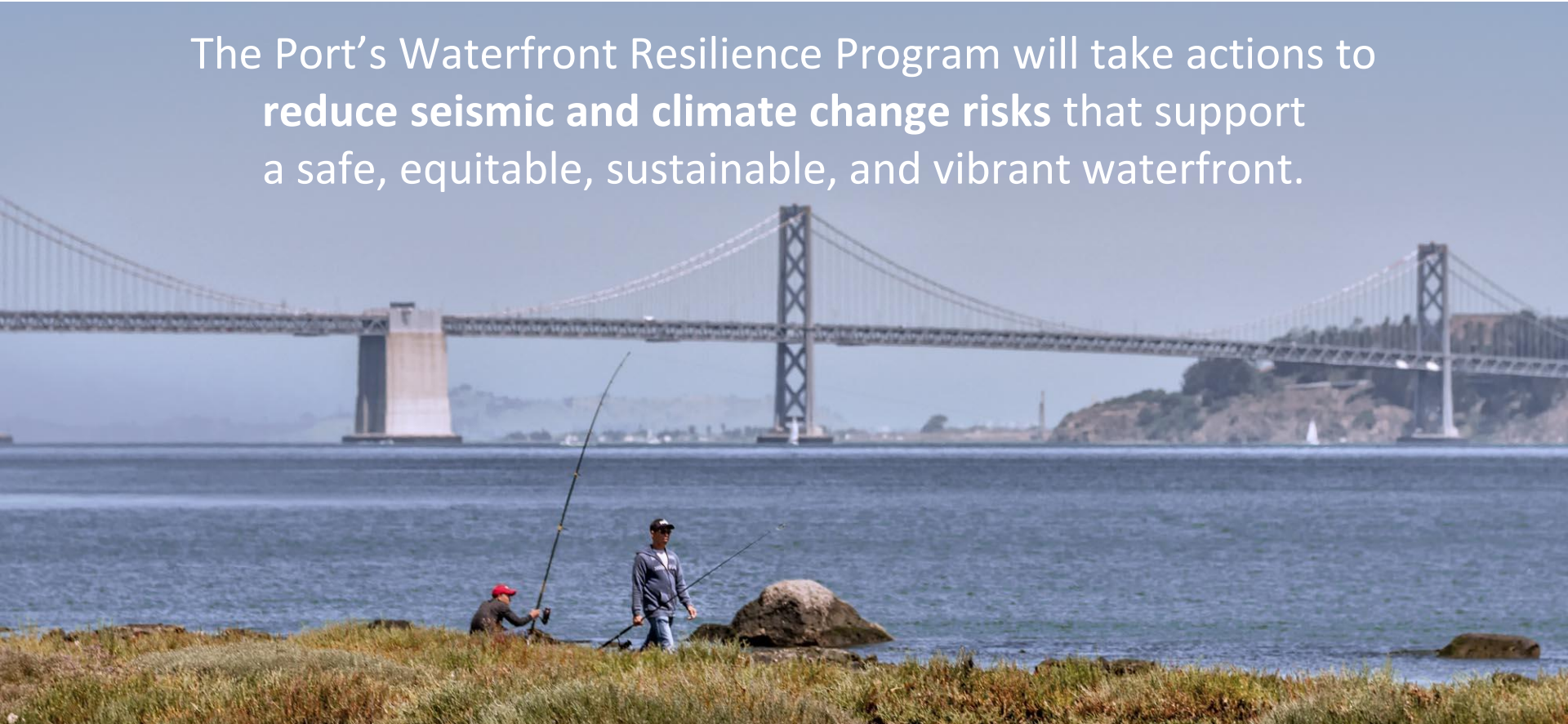
What impact from Sea Level Rise and inland flooding concerns you the most if you had to choose one?

Waterfront Resilience Program

What We're Doing

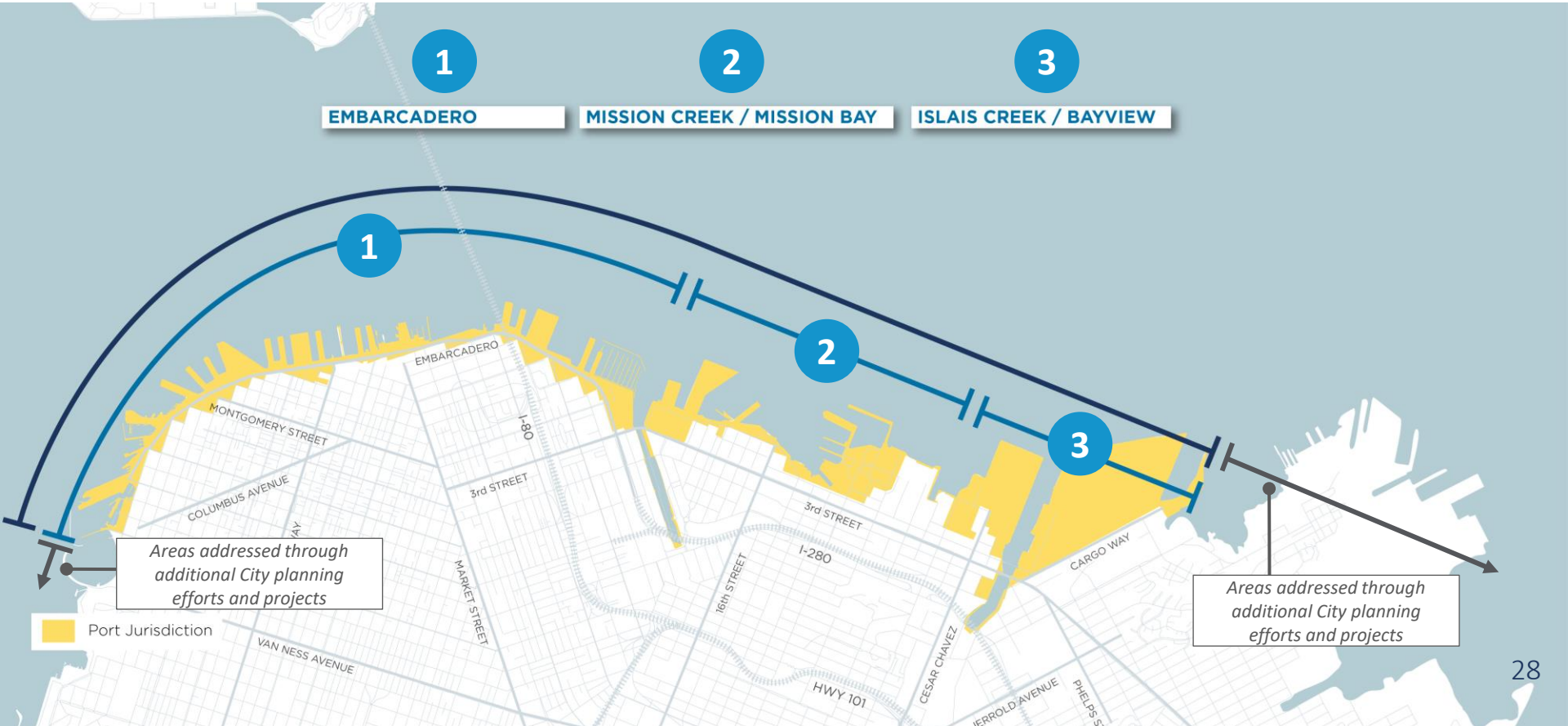
WATERFRONT RESILIENCE PROGRAM VISION STATEMENT

Affirmed through Robust Community Engagement



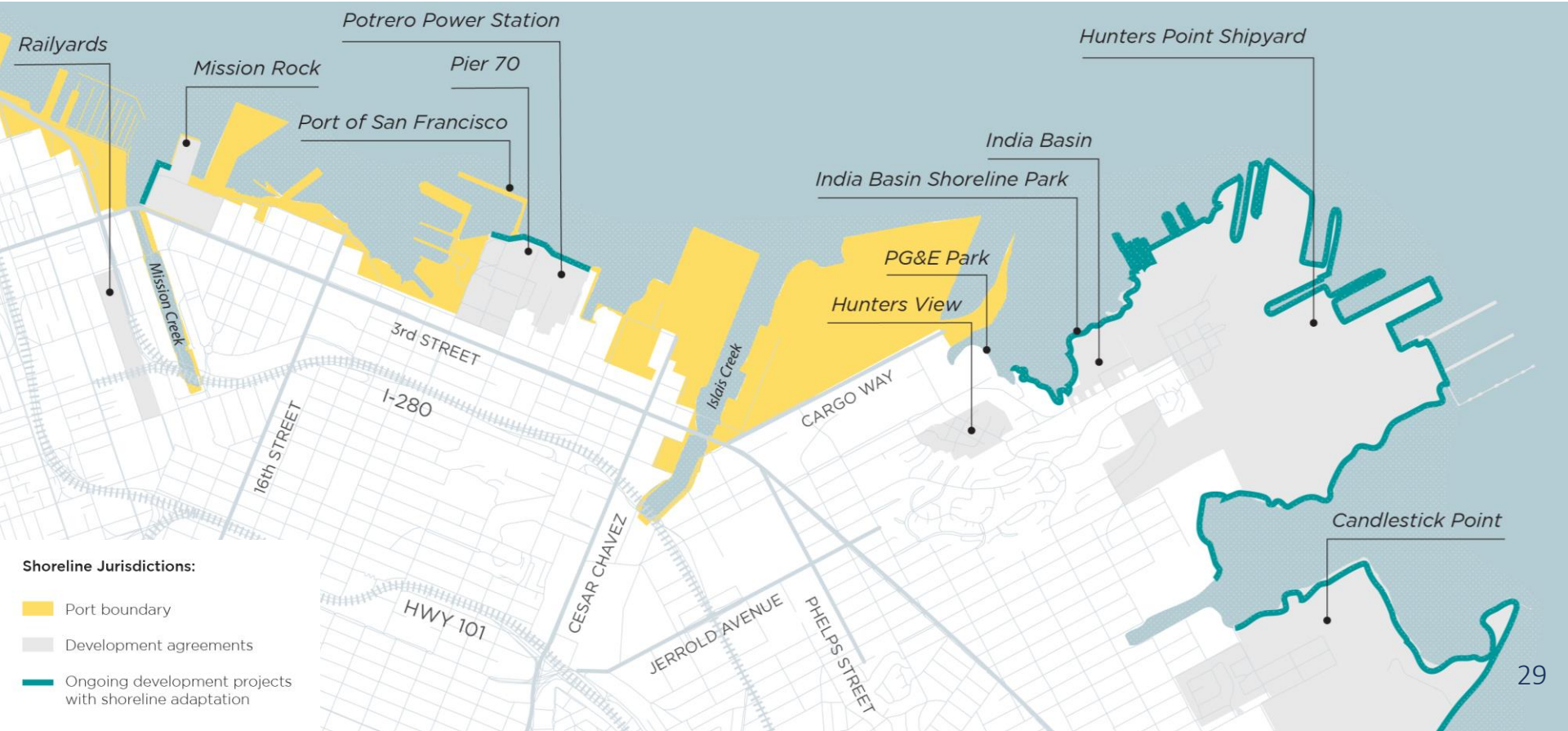
PROGRAM AREA

Focus is Conceptual-Level Strategies Within the Port's Jurisdiction



OTHER CITY ADAPTATION PROJECTS

Outside Port jurisdiction



Community Priorities

What We've Heard

DRAFT WATERFRONT ADAPTATION STRATEGIES

Community Input Helped Define the WRP

1. **Focus on life safety & emergency response**

2. **Prioritize assets most loved by the community and most important to the city**

3. **Put people first**
   Assets and services most prioritized: housing, disaster recovery facilities, utilities, transportation and businesses

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WHAT WE HEARD – EMBARCADERO SPECIFIC

Community Input Helped Define the WRP

- Key community-prioritized assets include: Muni Tunnel, Ferry Building, Exploratorium, Fisherman's Wharf
- Increased transportation options, open space and parks, and more family friendly activities
- Preserve and enhance jobs and diversity of jobs along the Embarcadero
- The Embarcadero Promenade is viewed as a critical asset and there is a strong desire to preserve and enhance it

NATURE BASED SOLUTIONS

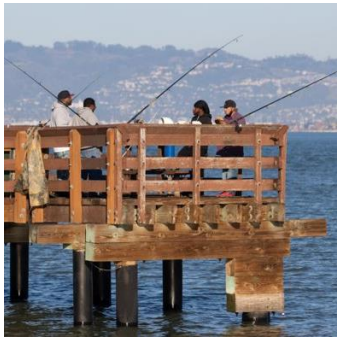
Prioritize Nature and Healing the Bay

PUBLIC SPACES

Expand Open Spaces and the City's Connection to the Waterfront









EQUITY

Center Racial and Social Equity and Environmental Justice

Range of Possible Solutions

What We're Considering

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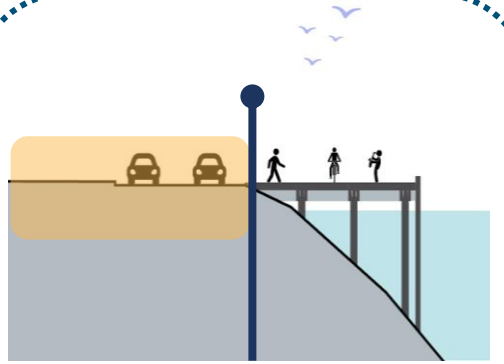
Waterfront Resilience Program

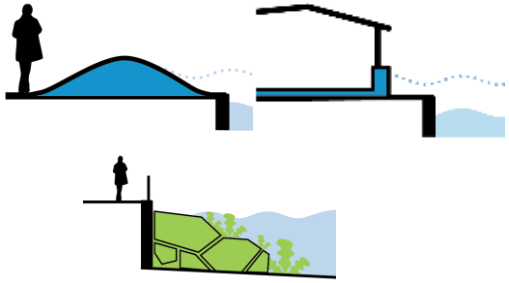
DRAFT WATERFRONT ADAPTATION STRATEGIES

Key Components



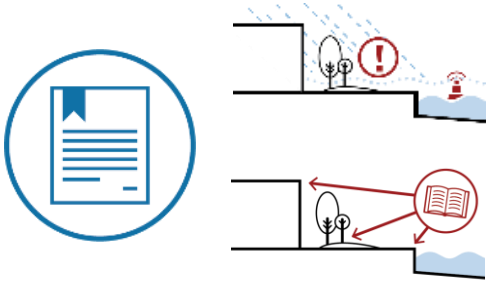
Coastal Flood Defense Location + Height

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

USACE SAN FRANCISCO WATERFRONT COASTAL FLOOD STUDY

Driving Questions

What if...
we **did not adapt** to mitigate the risks?

What if...
we adapted by **floodproofing** and **moving** buildings and assets, *without* coastal flood structures?

What if...
we address flooding at **a lower rate** of sea level rise?

What if...
we address flooding **at a higher rate** of sea level rise, as recommended by **CA and SF guidance**?

USACE SAN FRANCSICO WATERFRONT COASTAL FLOOD STUDY

Draft Waterfront Adaptation Strategies

What if...
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STRATEGY A

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STRATEGY C

STRATEGY D

What if...
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STRATEGY E

STRATEGY F

STRATEGY G

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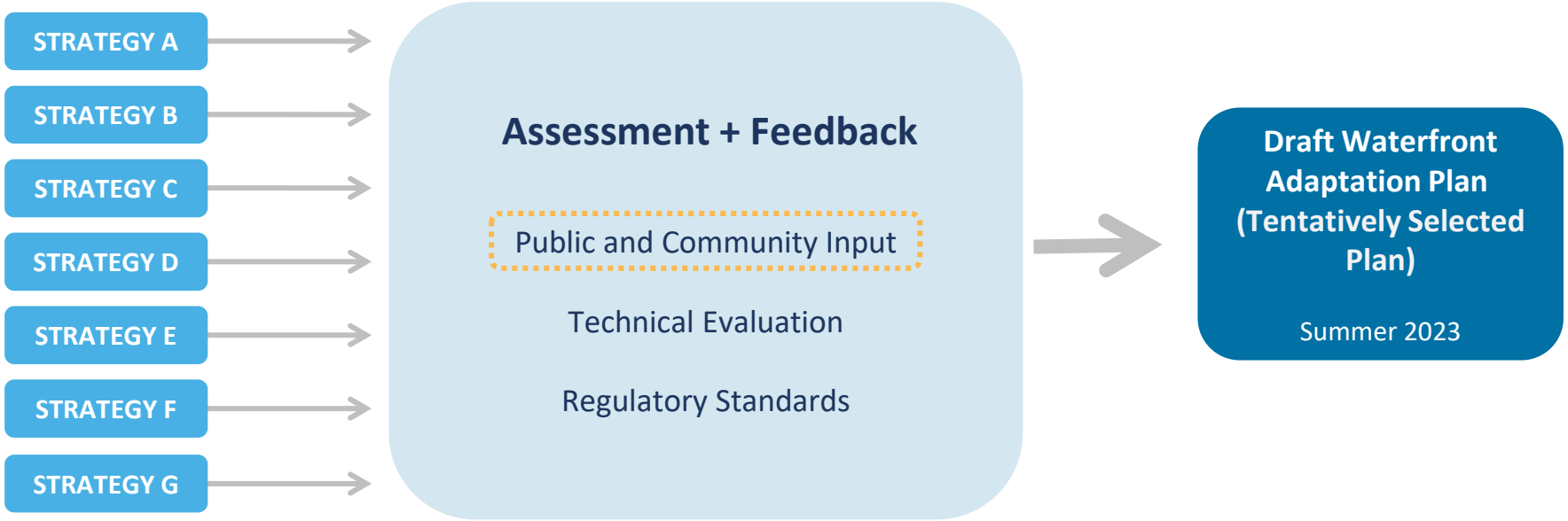
THE ROLE OF COMMUNITY FEEDBACK

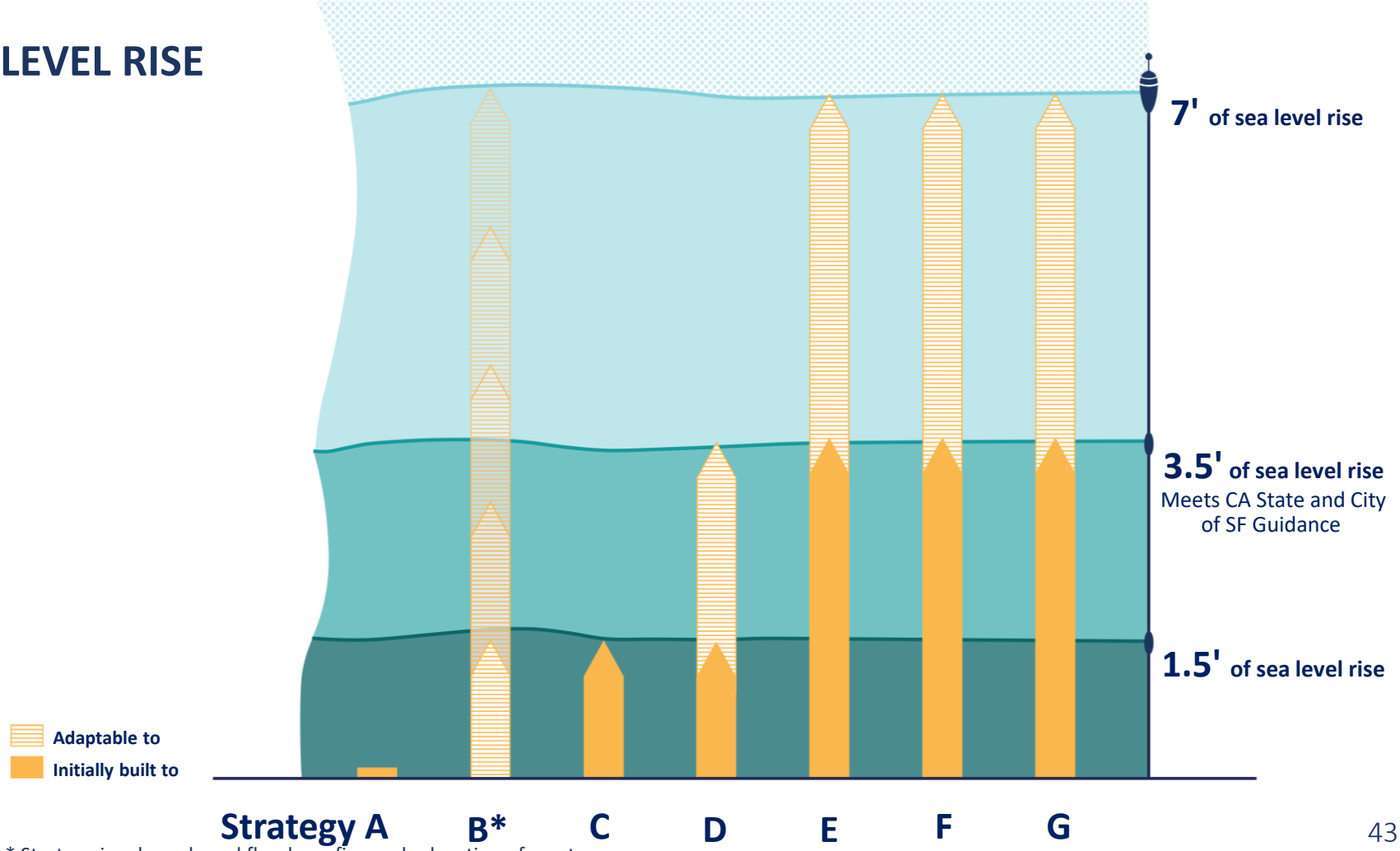
Pathway to the Draft Waterfront Adaptation Plan



Draft Waterfront Adaptation Strategies in the Embarcadero

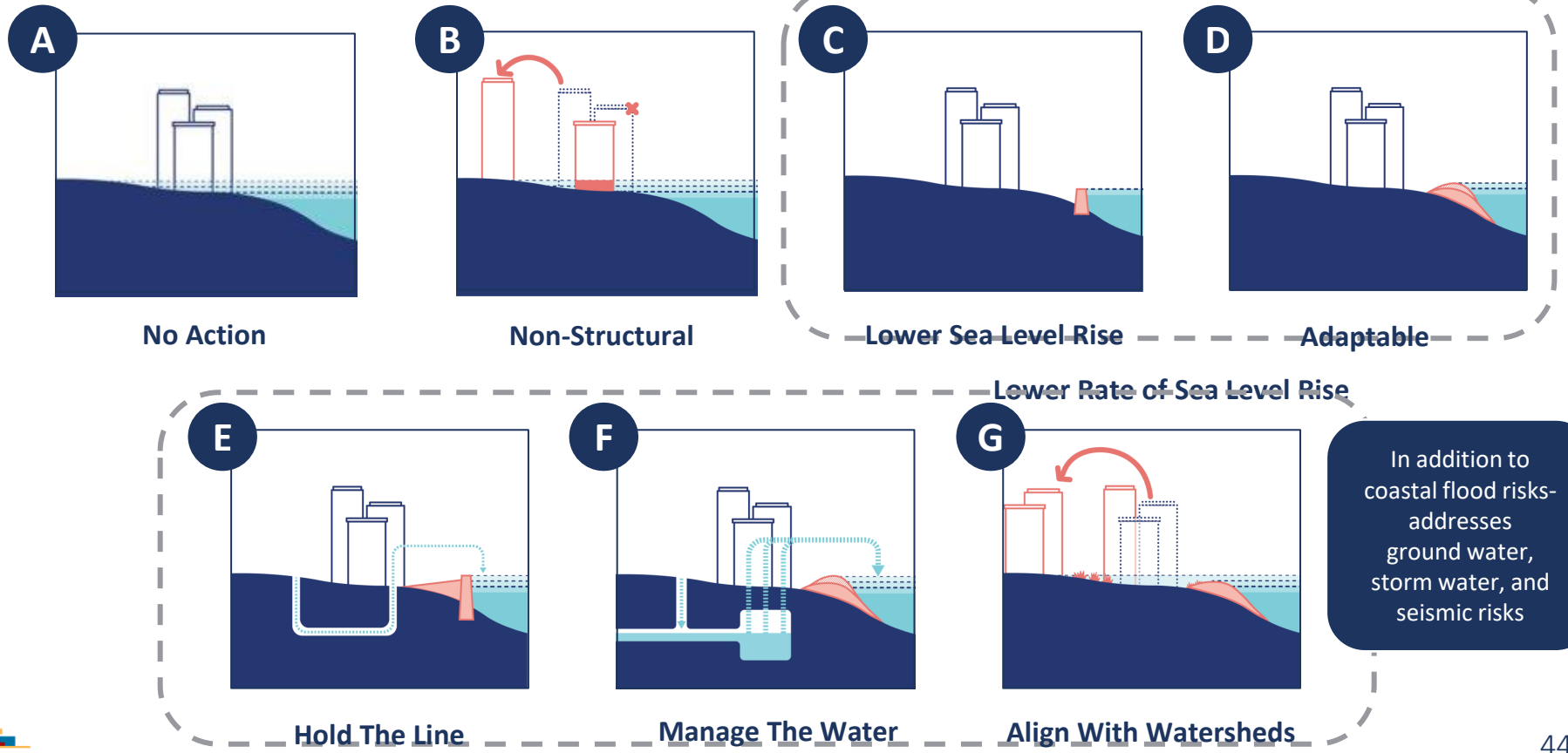
TIME HORIZONS

SEA LEVEL RISE



* Strategy involves phased floodproofing and relocation of assets

WATERFRONT DRAFT ADAPTATION STRATEGIES



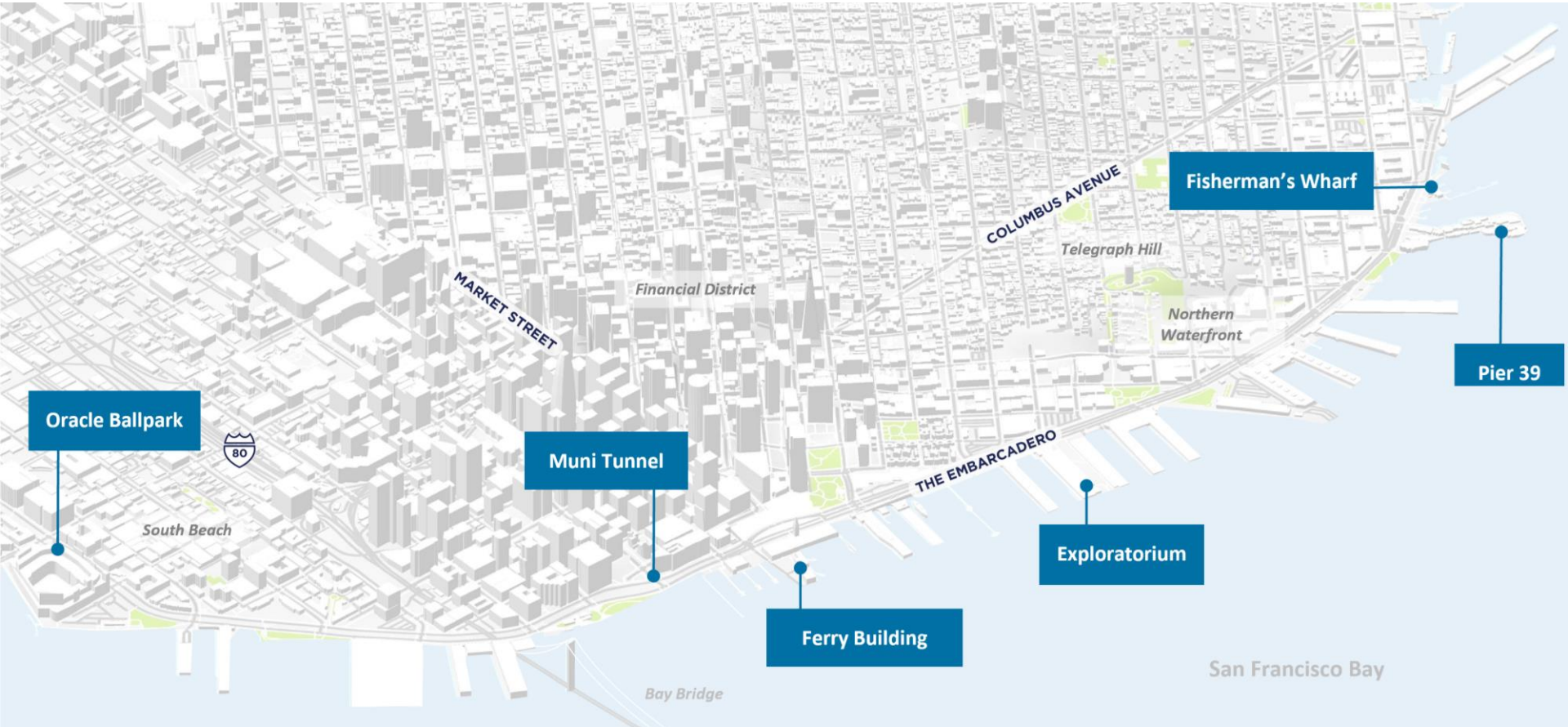
In addition to coastal flood risks- addresses ground water, storm water, and seismic risks

EMBARCADERO

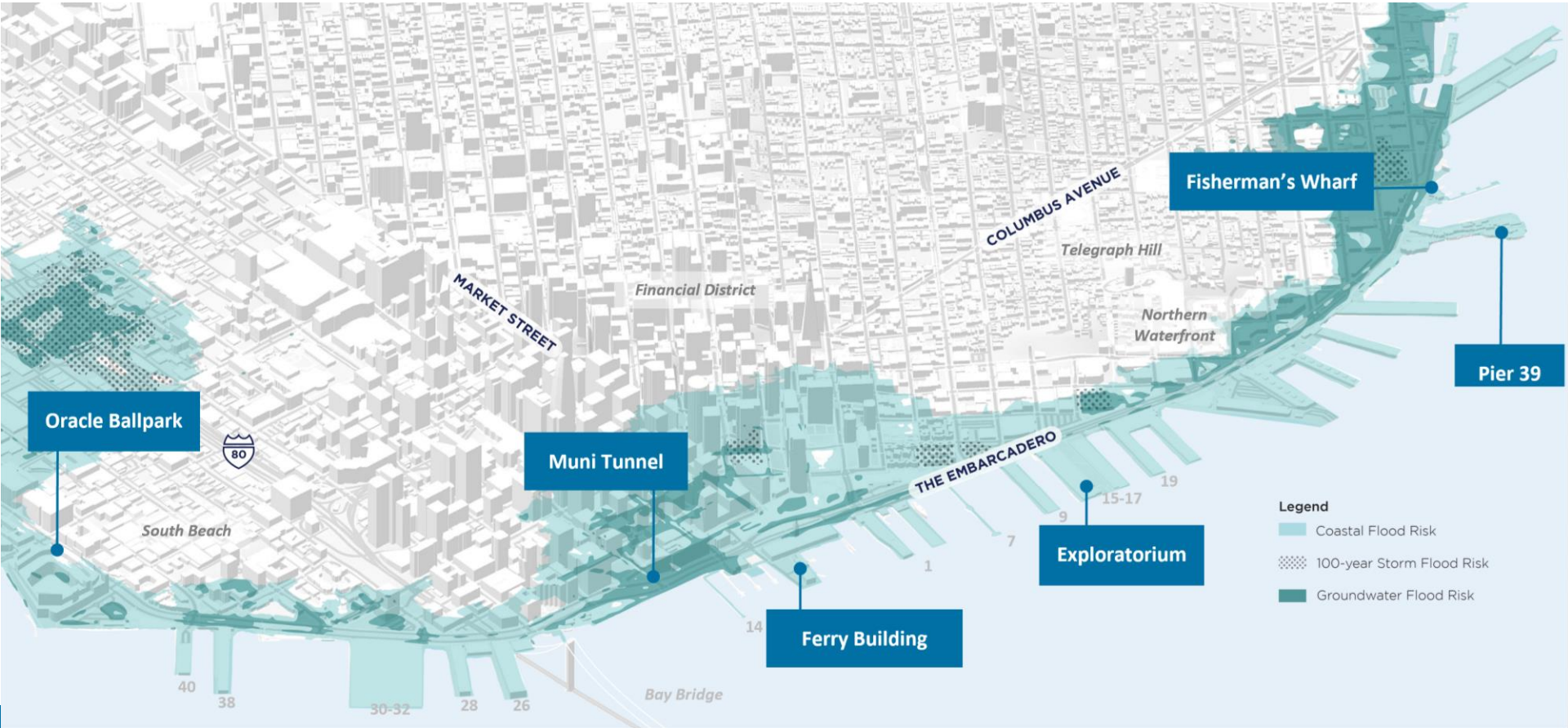
Geographic Context

- Very high-density area of jobs and housing + registered historic district
- Limited Space for Adaptation
- Critical Transportation Corridor – Bart and Muni
- Flood and Earthquake risk to Maritime Operations and Crucial Disaster Response Functions

EMBARCADERO



EMBARCADERO



USACE SAN FRANCISCO WATERFRONT COASTAL FLOOD STUDY

Focused on Strategies A-D

What if...
we **did not adapt** to mitigate the risks?

STRATEGY A

What if...
we adapted by **floodproofing** and **moving** buildings and assets, *without* coastal flood structures?

STRATEGY B

What if...
we address flooding at **a lower rate** of sea level rise?

STRATEGY C

STRATEGY D

What if...
we address flooding **at a higher rate** of sea level rise, as recommended by **CA and SF guidance**?

STRATEGY E

STRATEGY F

STRATEGY G

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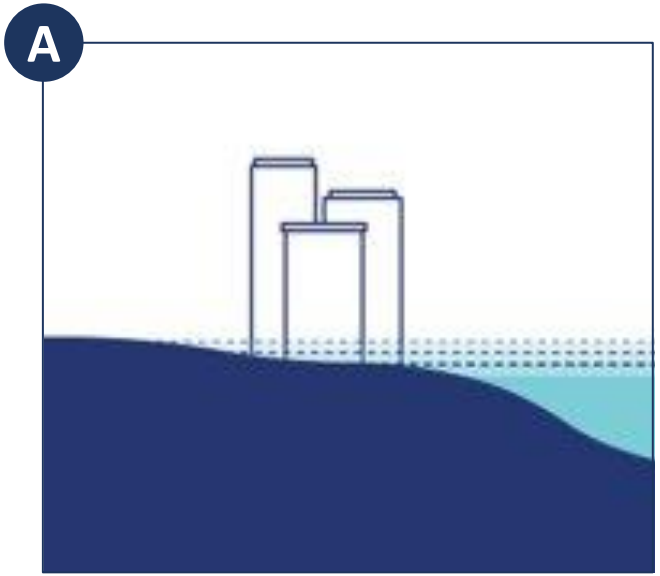
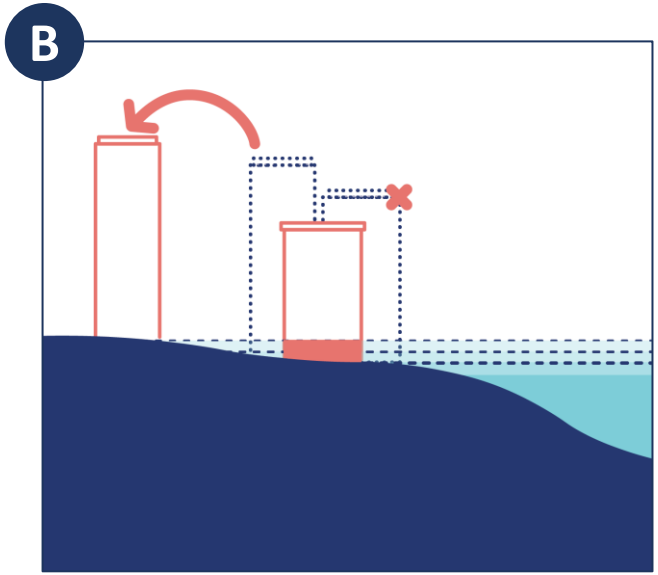
STRATEGY A – NO ACTION



This strategy takes no actions to reduce flood risks beyond projects that are already approved

STRATEGY B – NONSTRUCTURAL OPTION

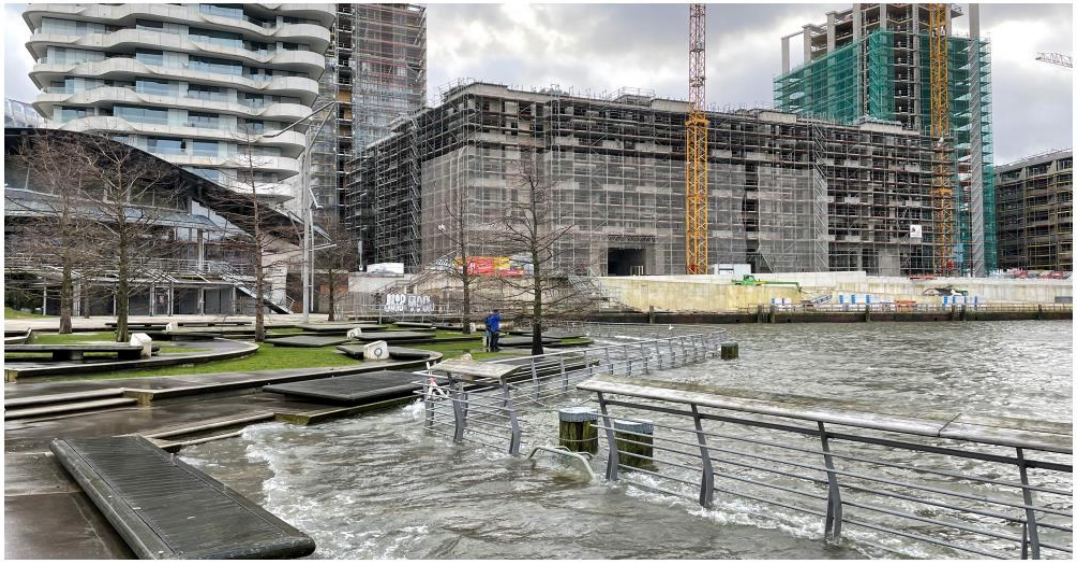


Moves people and assets away from the risk, uses nonstructural measures (such as floodproofing) to reduce risks, and allows water to go where it wants rather than constructing traditional structural solutions

STRATEGY B – NONSTRUCTURAL OPTION

Examples

- **Floodproofing**
- **Raising structure in place**
- **Floodable spaces**
- **Buyouts**
- **Warning systems**



USACE SAN FRANCISCO WATERFRONT COASTAL FLOOD STUDY

Focused on Strategies A-D

What if...
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STRATEGY C

STRATEGY D

What if...
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STRATEGY E

STRATEGY F

STRATEGY G

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ORIENTATION TO THE MAPS

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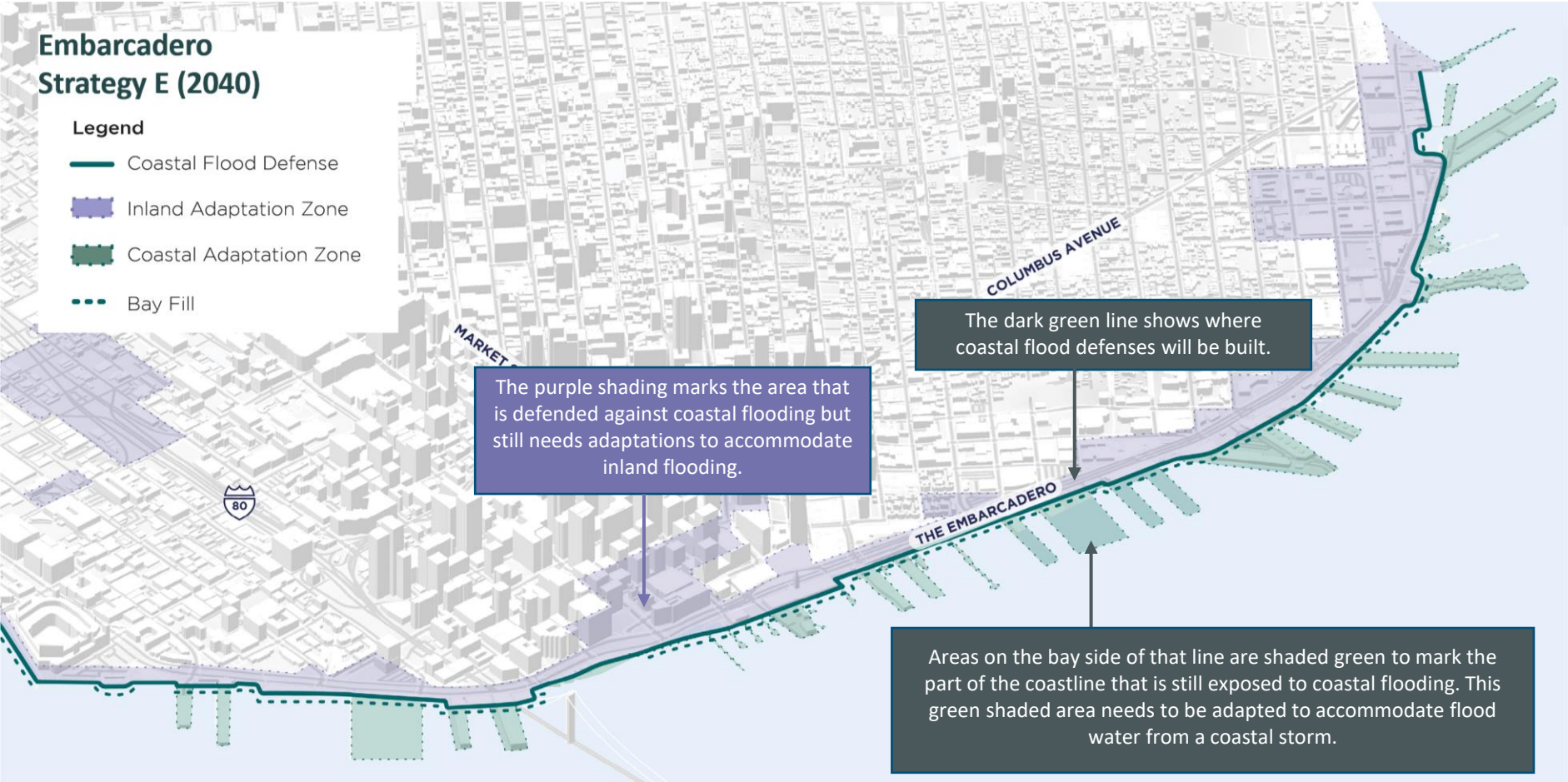

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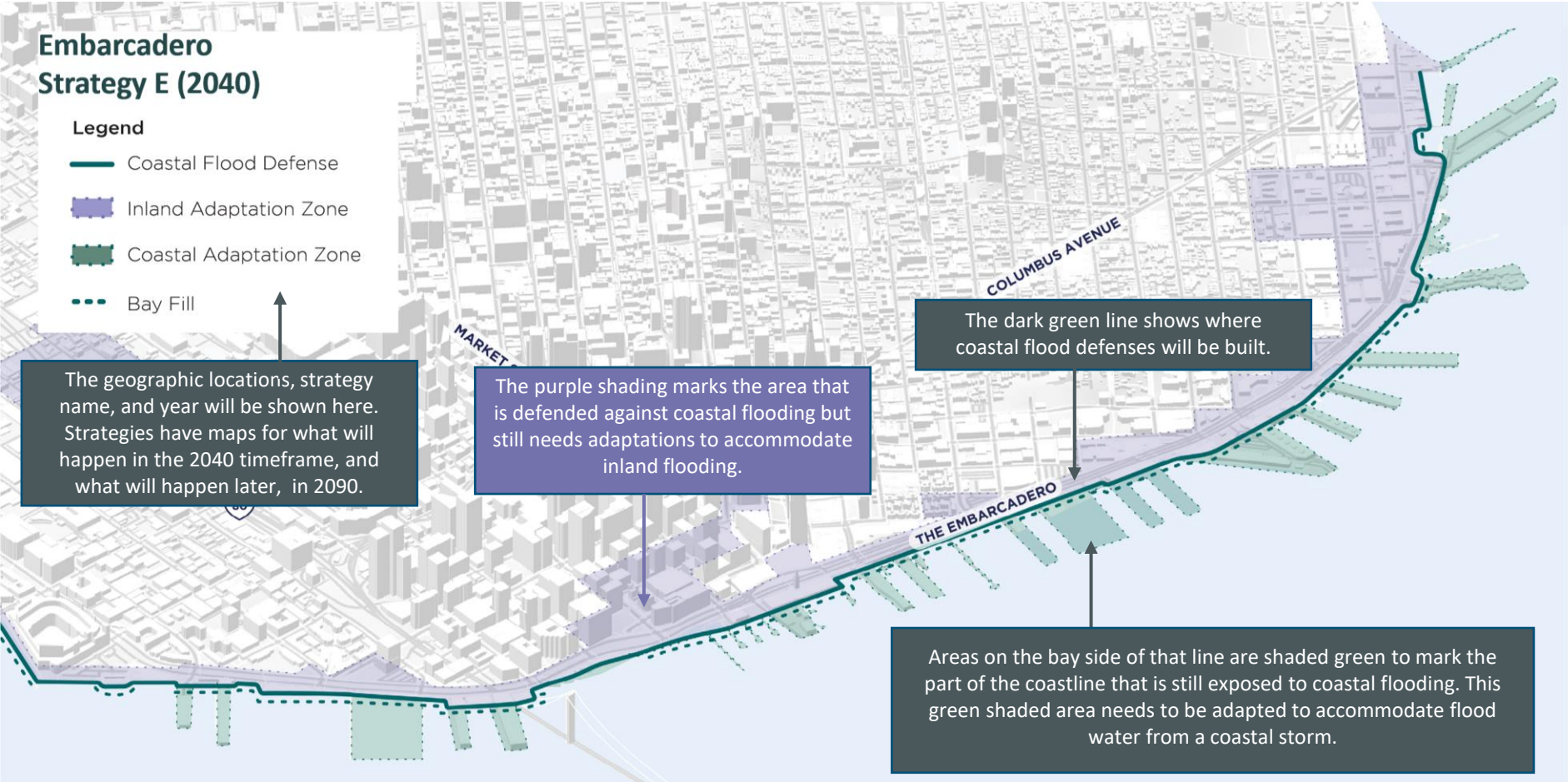

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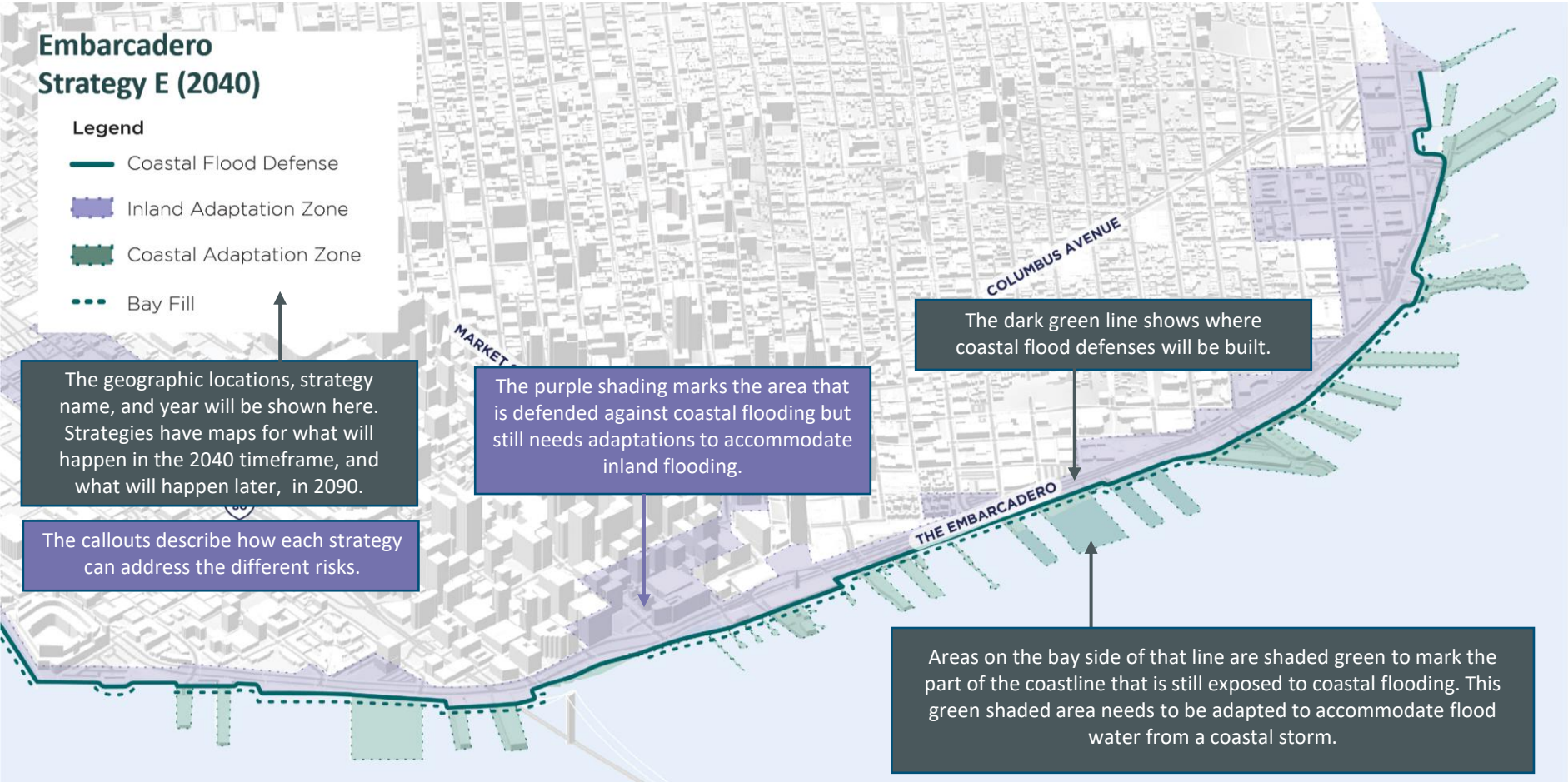
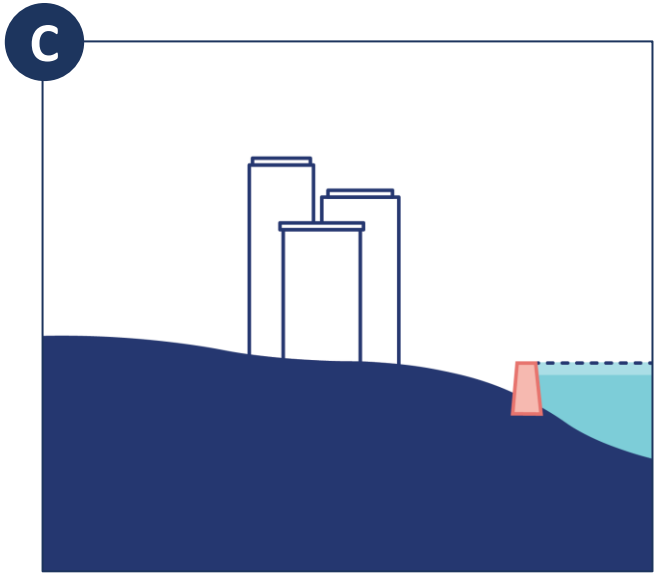


STRATEGY C – LOWER SEA LEVEL RISE



Adapts the shoreline to withstand 1.5’ of sea level rise by 2040 using a combination of structural and nonstructural measures

STRATEGY C – LOWER SEA LEVEL RISE

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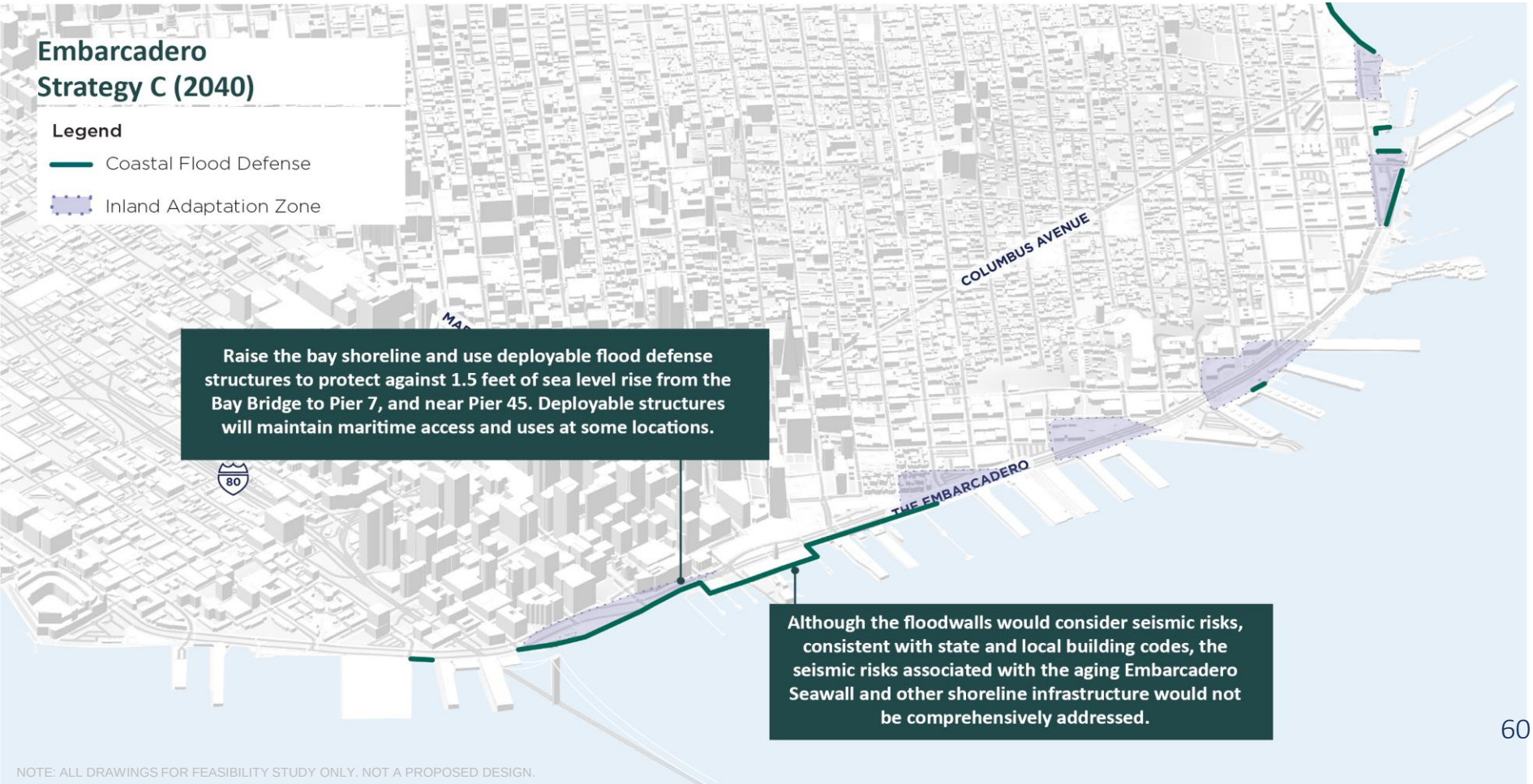
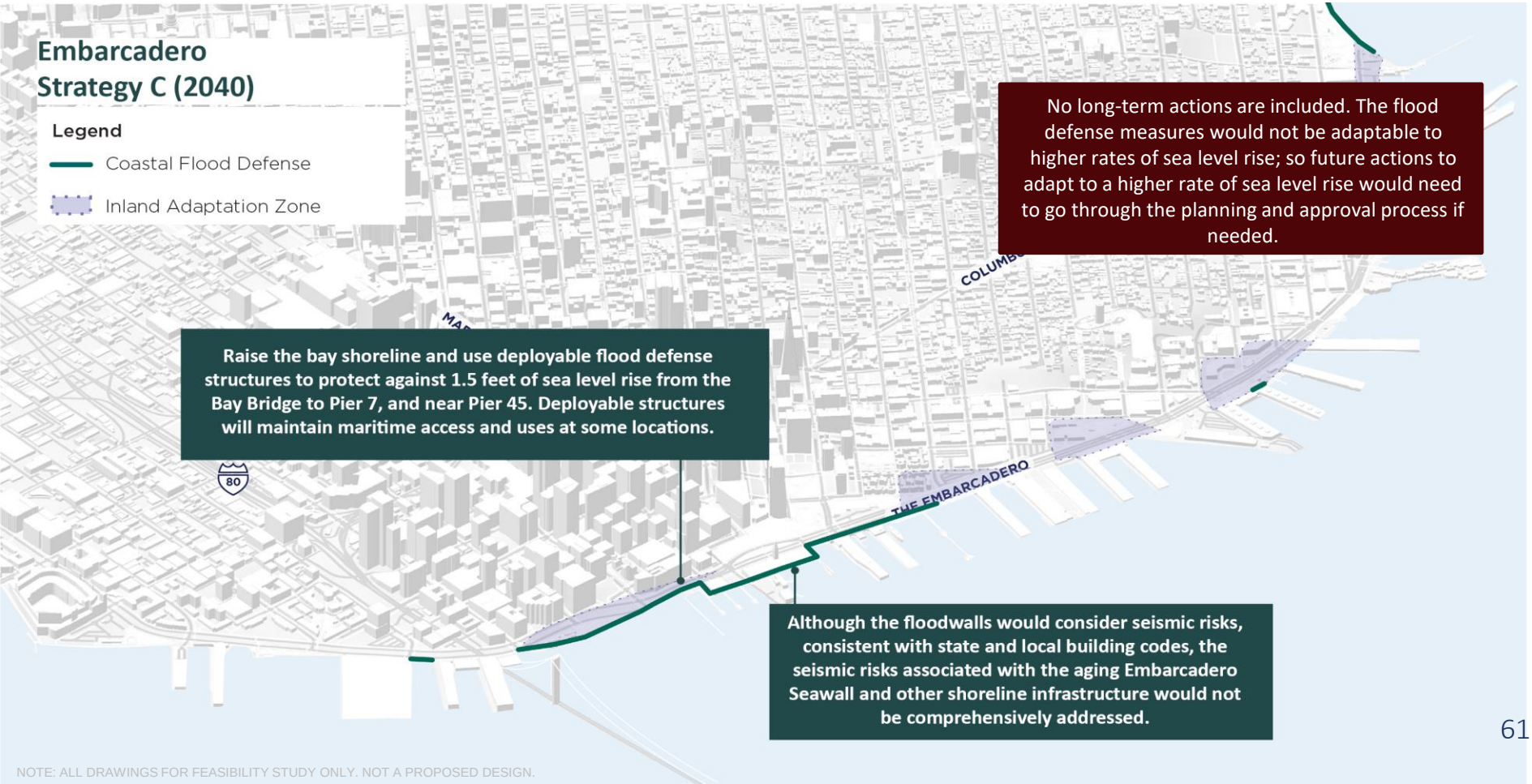


STRATEGY C – LOWER SEA LEVEL RISE



NOTE: ALL DRAWINGS FOR FEASIBILITY STUDY ONLY. NOT A PROPOSED DESIGN.

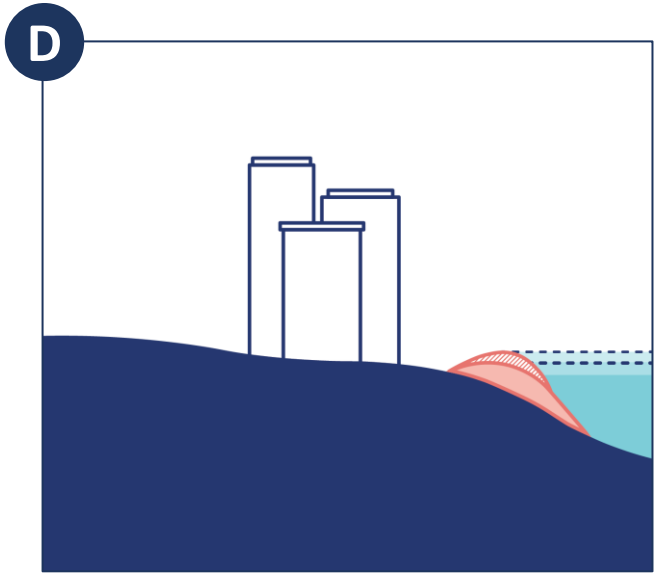
A NOTE ABOUT POLLS

- Temperature Check
- Not a Vote
- Optional

POLL QUESTION #3

Strategy C would cost less by making smaller improvements than other options but assumes a lower rate of sea level rise (and does not include any seismic improvements). Do you support this approach?

STRATEGY D – LOWER SEA LEVEL RISE – ADAPTABLE



Adapts the shoreline to withstand 1.5’ of sea level rise by 2040, with the possibility of building higher by 2090

STRATEGY D – LOWER SEA LEVEL RISE – ADAPTABLE

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STRATEGY D – LOWER SEA LEVEL RISE – ADAPTABLE

POLL QUESTION #4

Strategy D would cost less by making smaller improvements than other options but assumes a lower rate of sea level rise. It would be designed to be adaptable to higher sea level rise in the future and includes some seismic improvements. Do you support this approach?

USACE SAN FRANCSICO WATERFRONT COASTAL FLOOD STUDY

Focused on Strategies E, F, and G

What if...
we **did not adapt** to mitigate the risks?

STRATEGY A

What if...
we adapted by **floodproofing** and **moving** buildings and assets, *without* coastal flood structures?

STRATEGY B

What if...
we address flooding at **a lower rate** of sea level rise?

STRATEGY C

STRATEGY D

What if...
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STRATEGY E

STRATEGY F

STRATEGY G

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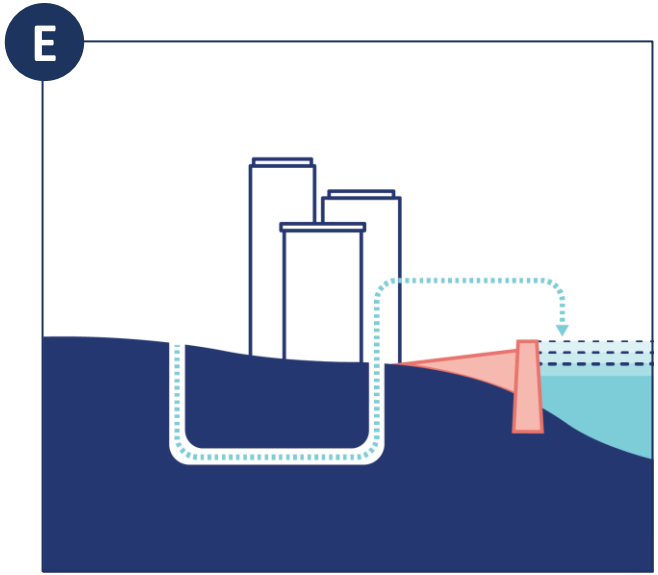
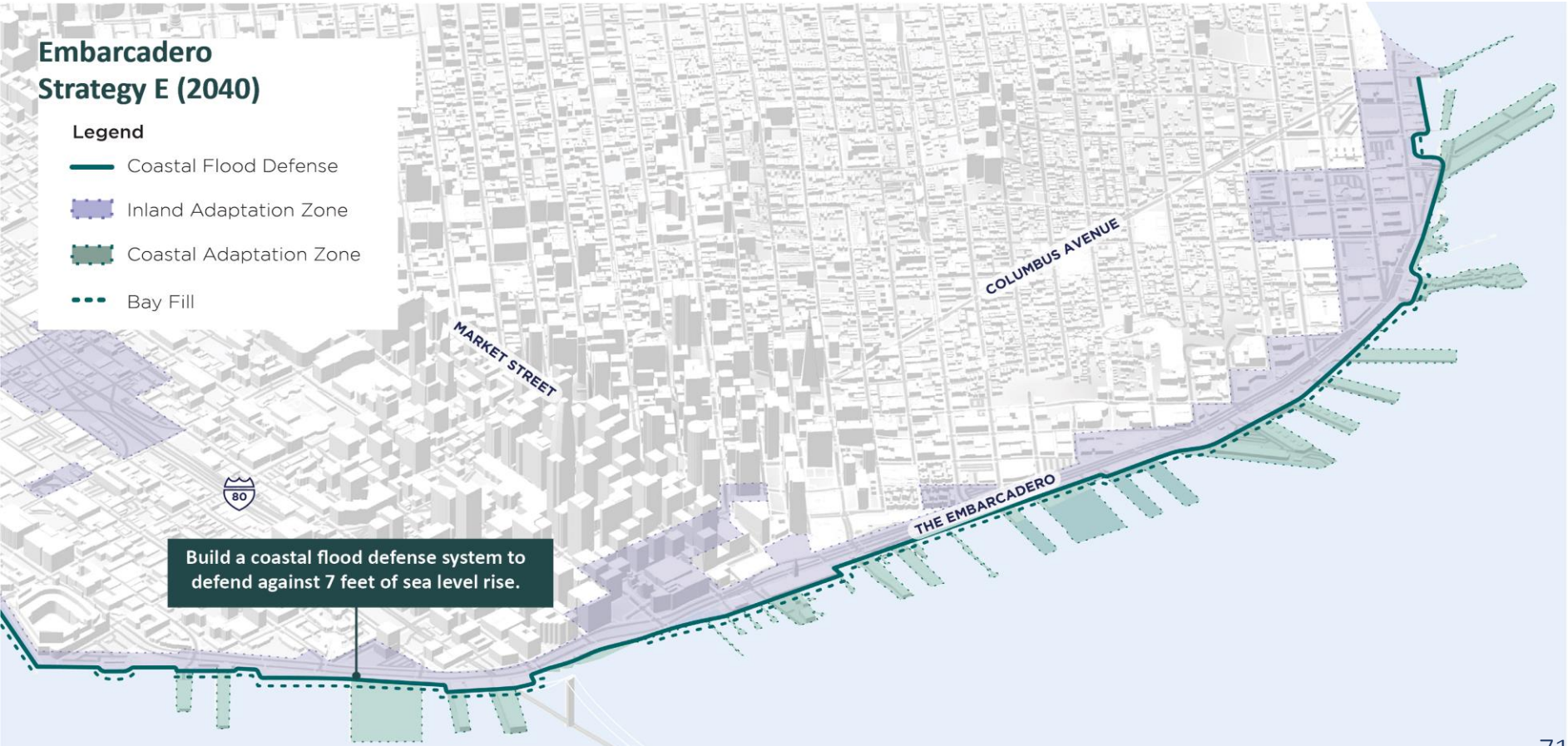
STRATEGY E – HIGHER SEA LEVEL RISE – HOLD THE LINE



Preserves a waterfront that looks and functions much as it does today by adapting the shoreline

STRATEGY E – HIGHER SEA LEVEL RISE – HOLD THE LINE

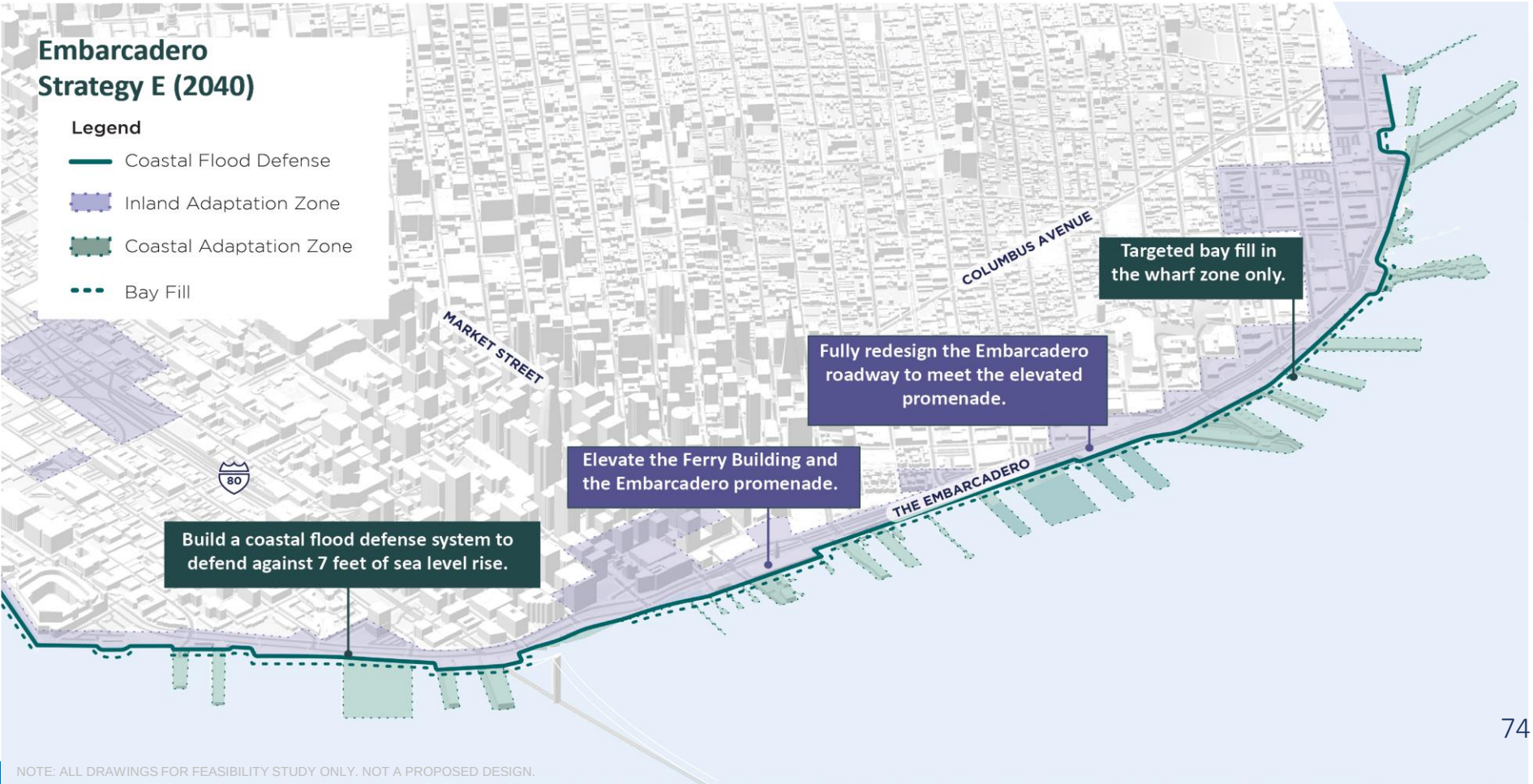


STRATEGY E – HIGHER SEA LEVEL RISE – HOLD THE LINE

STRATEGY E – HIGHER SEA LEVEL RISE – HOLD THE LINE

NOTE: ALL DRAWINGS FOR FEASIBILITY STUDY ONLY. NOT A PROPOSED DESIGN.

STRATEGY E – HIGHER SEA LEVEL RISE – HOLD THE LINE



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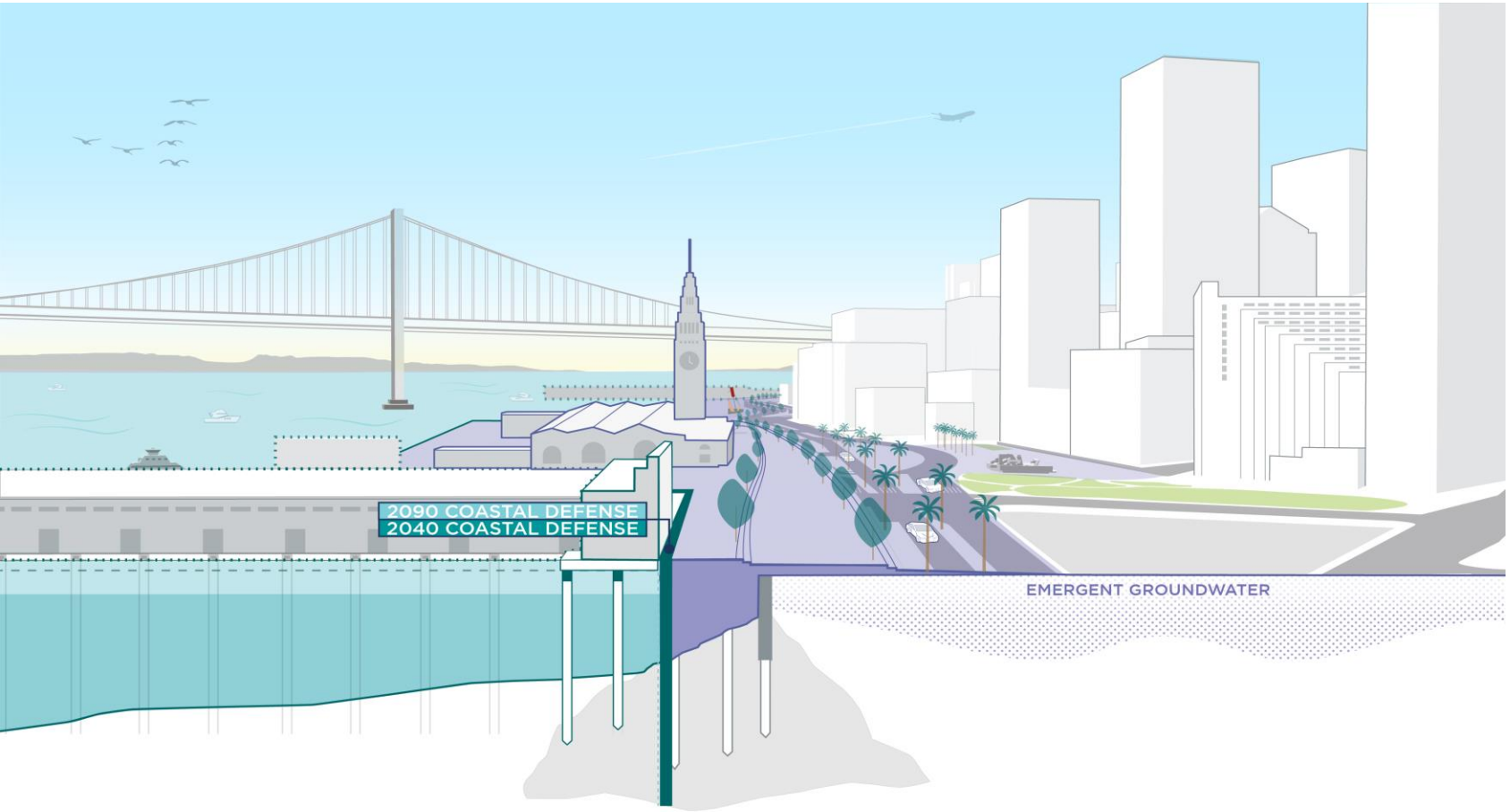


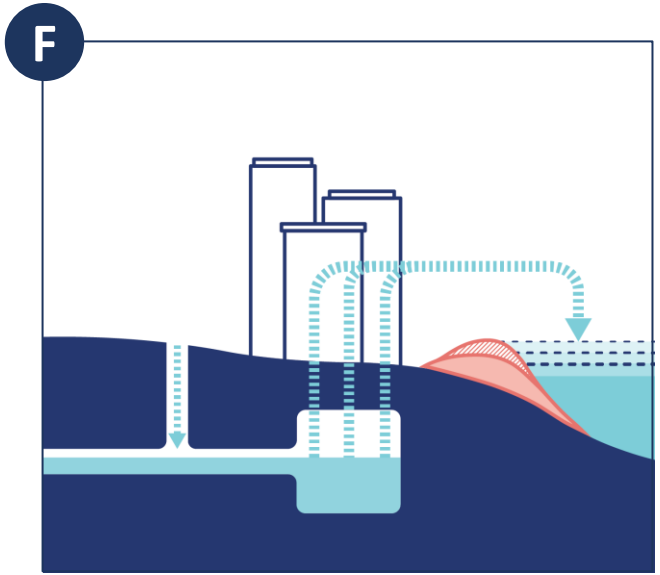
STRATEGY E – HIGHER SEA LEVEL RISE – HOLD THE LINE

Embarcadero in 2040

POLL QUESTION #5

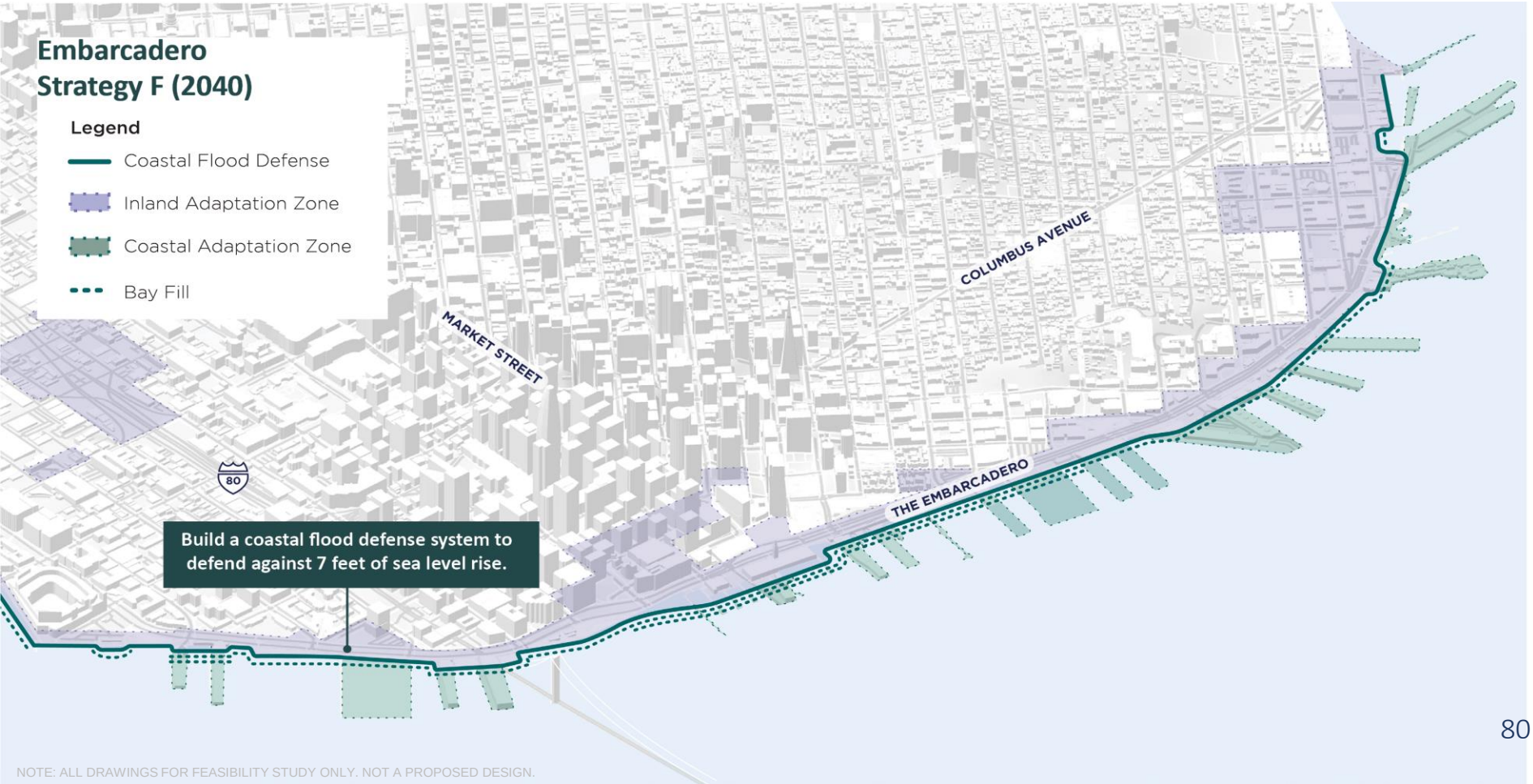
Strategy E would use limited targeted bay fill in the wharf zone and require fully redesigning the existing Embarcadero roadway. The resulting design would allow for space for a generous promenade and would slightly narrow the space available for the Embarcadero roadway (approximately the width of the parking lane). Do you support this approach? (Select all that apply)

STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER



Creates an active system for managing flooding by heavily relying on machinery

STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER



STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER

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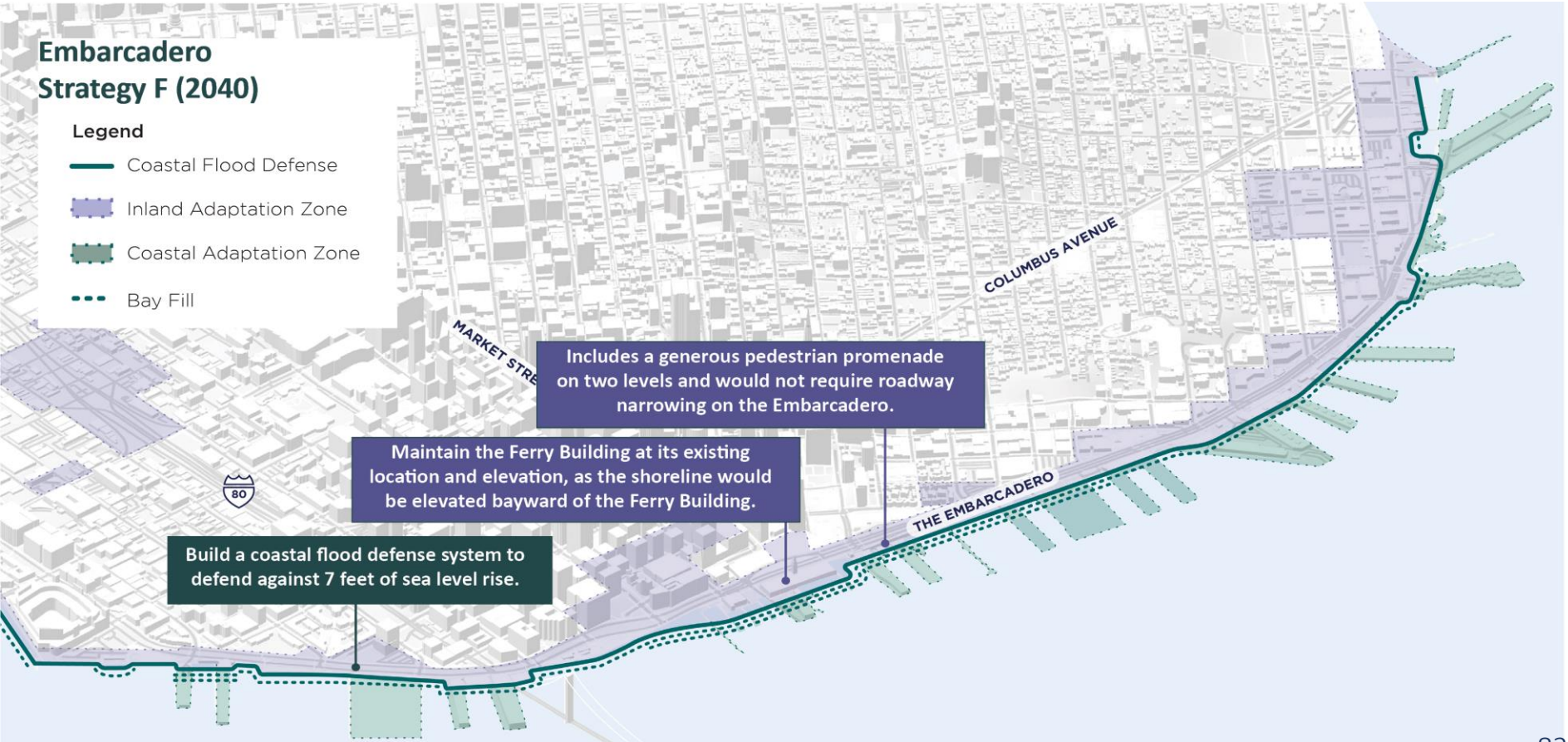
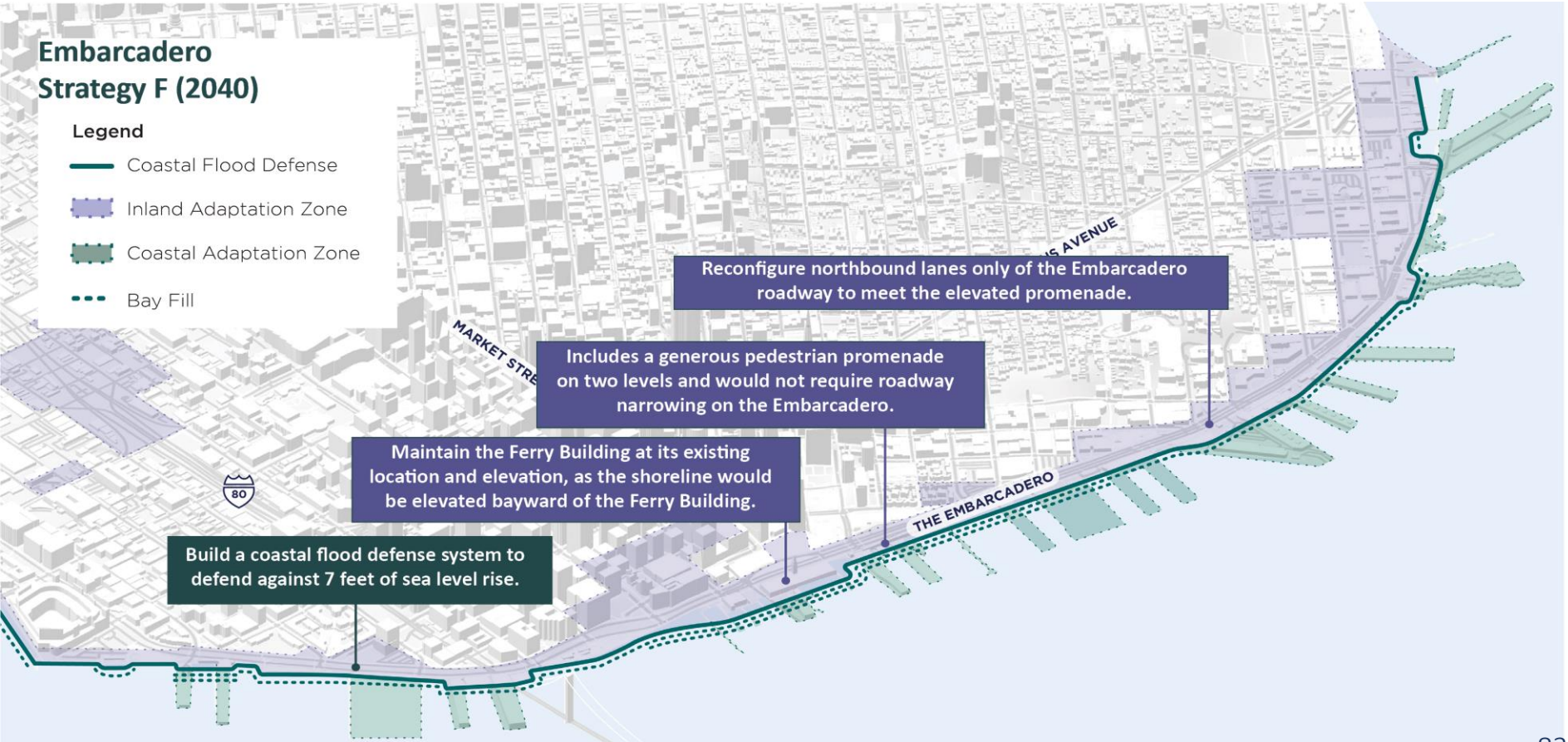


STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER



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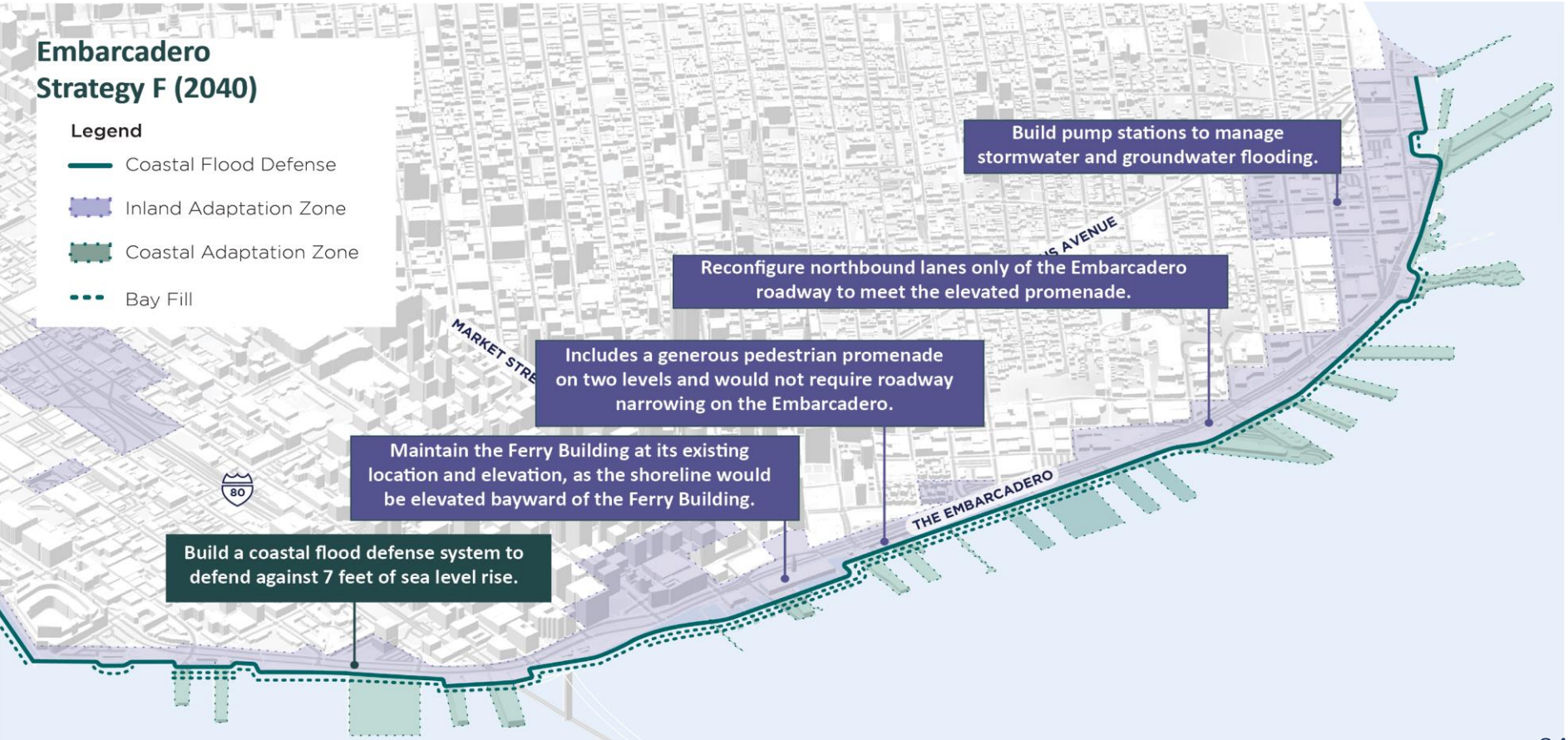
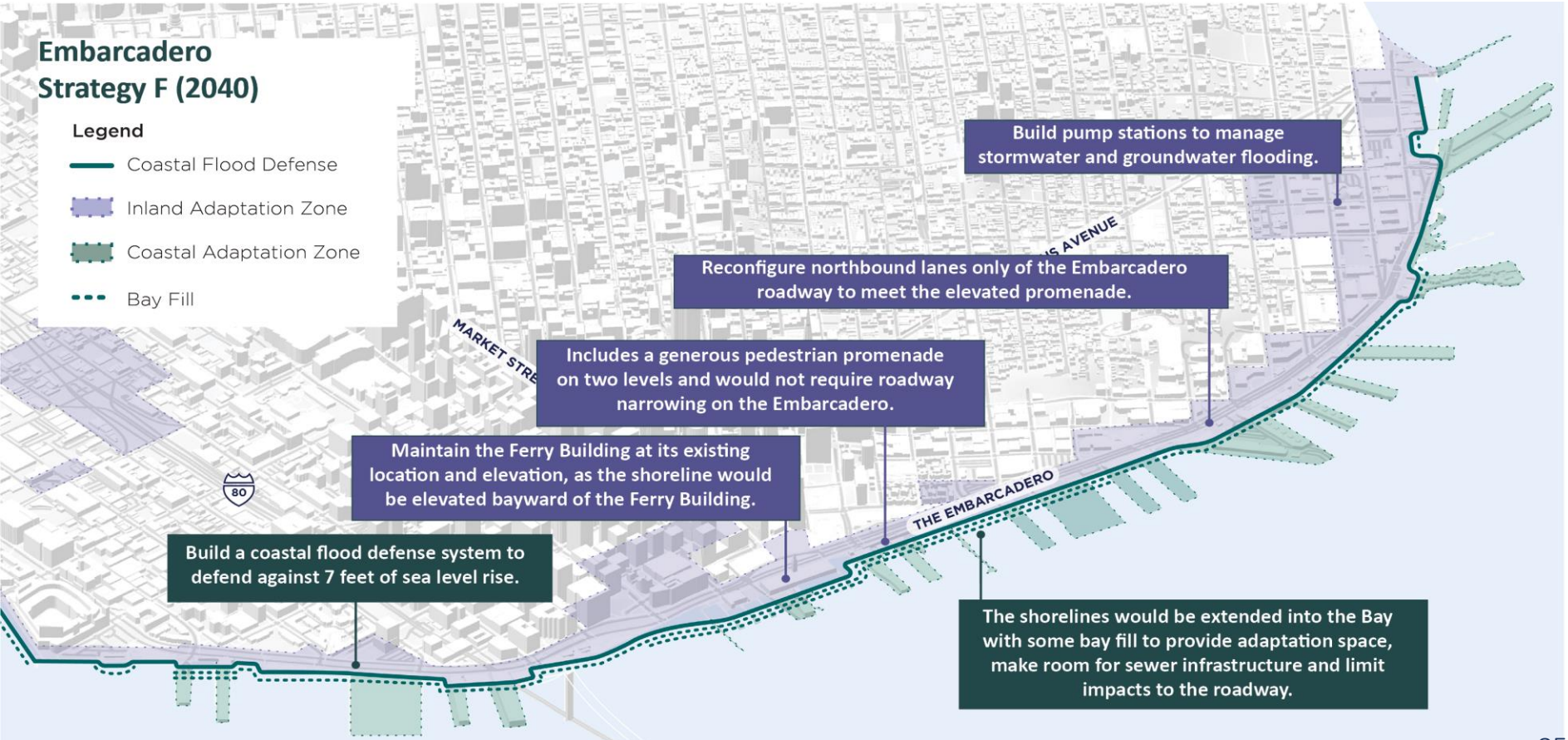
STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER



STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER



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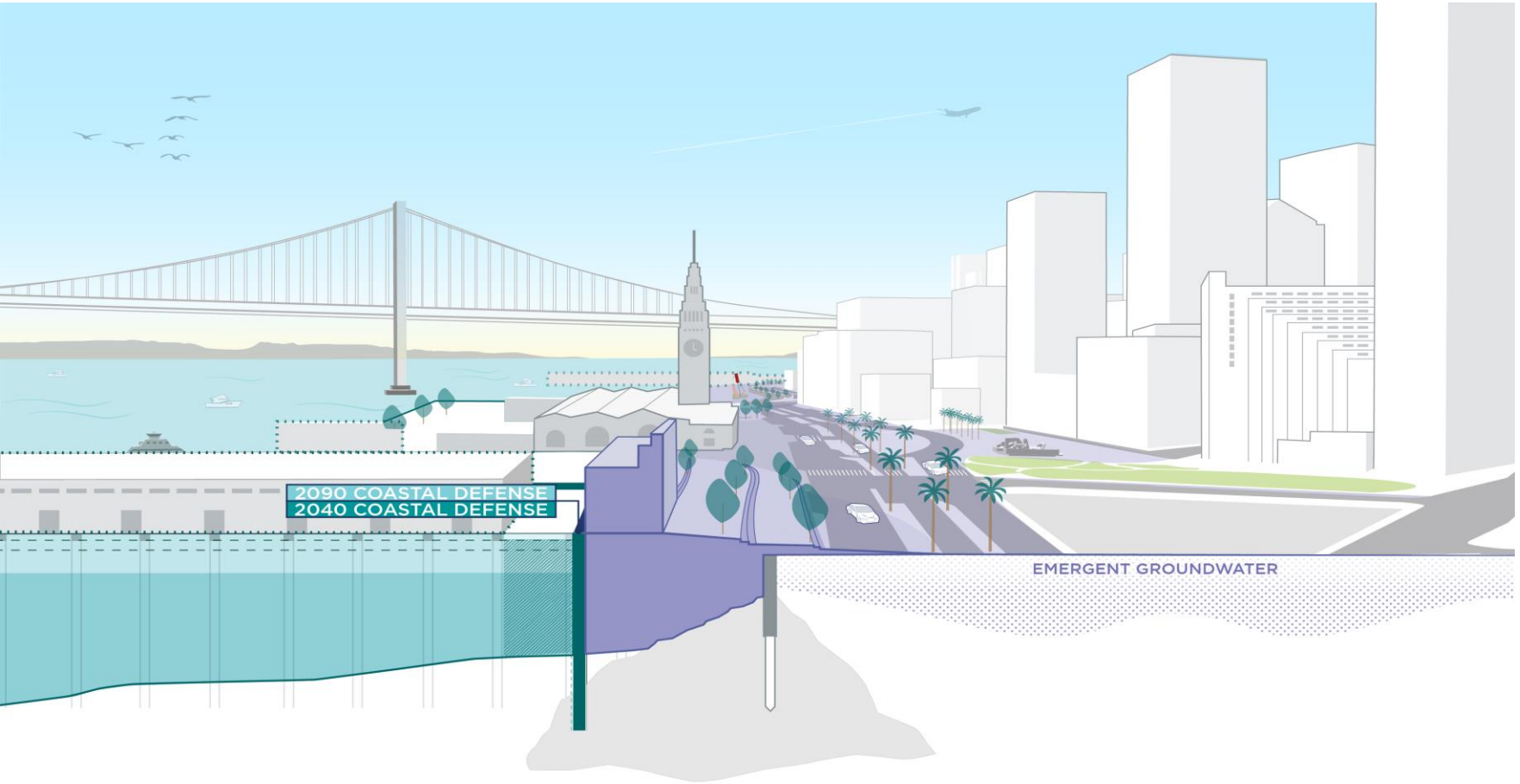
STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER



STRATEGY F – HIGHER SEA LEVEL RISE – MANAGE THE WATER

Embarcadero in 2040

Elevated bayward promenade with public realm improvements

Ferry Building stays in place

Most bay fill

Limited impacts to mobility corridor

2090 Shoreline Adaptation

2040 Shoreline Adaptation

Habitat terraces

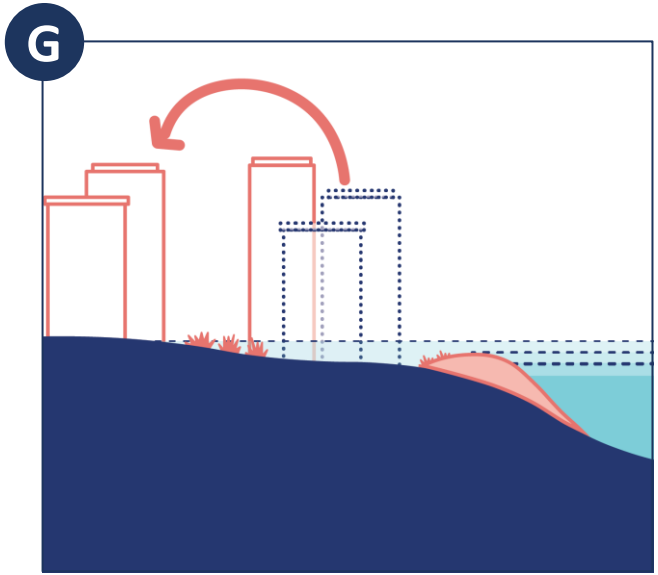
Active stormwater management

Existing Shoreline

POLL QUESTION #6

Strategy F would use more bay fill than strategy E, beyond the wharf zone, to expand pedestrian public access opportunities on the Embarcadero and therefore require a redesign of only the northbound lanes of the roadway. The resulting design would allow for space for a generous promenade and would not narrow the space available for the Embarcadero roadway. Do you support this approach? (Select all that apply)

STRATEGY G – HIGHER SEA LEVEL RISE – ALIGN WITH WATERSHEDS



Advances shoreline adaptation while working with natural inland flooding patterns to floodproof some buildings and infrastructure and move others away from the highest risk areas

STRATEGY G – HIGHER SEA LEVEL RISE – ALIGN WITH WATERSHEDS

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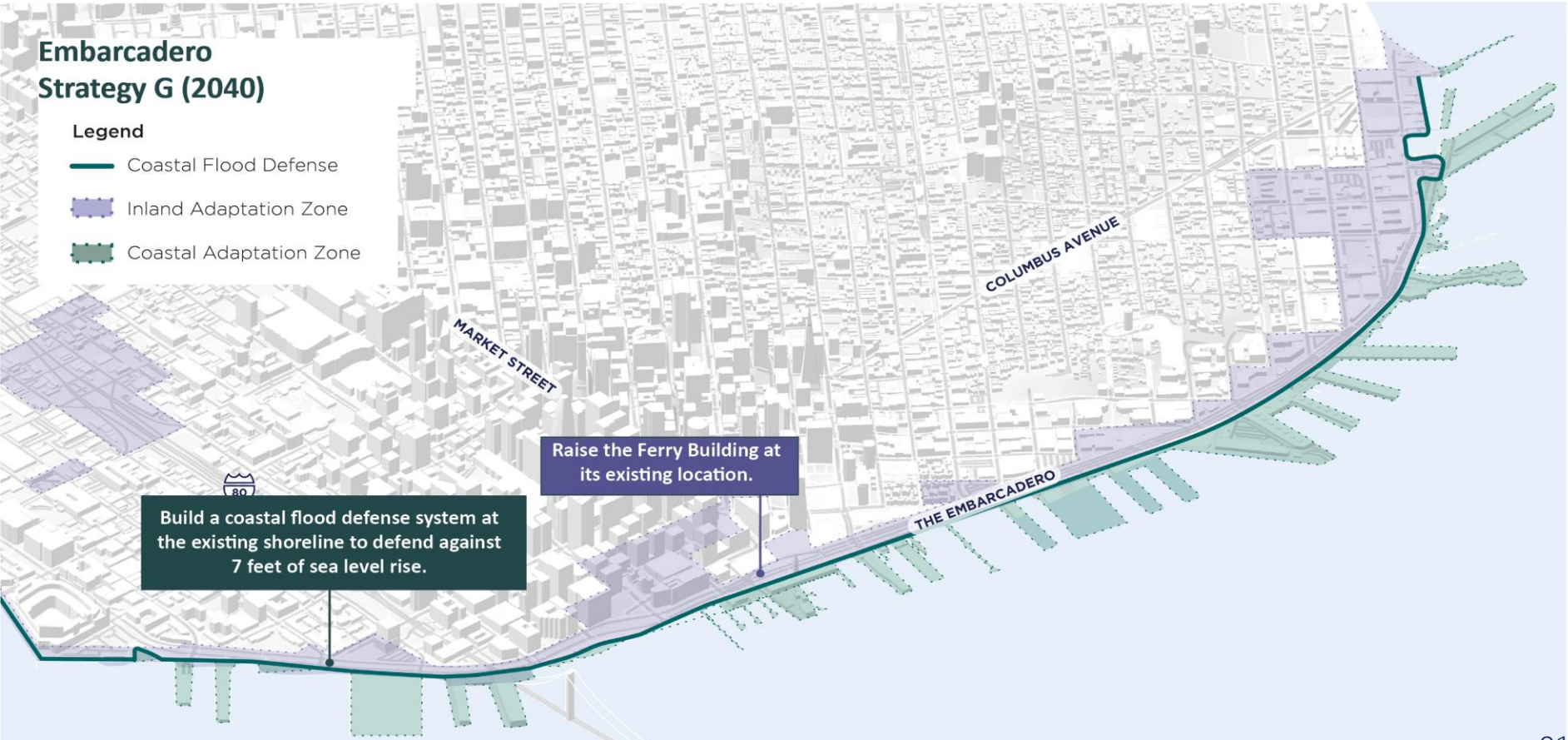

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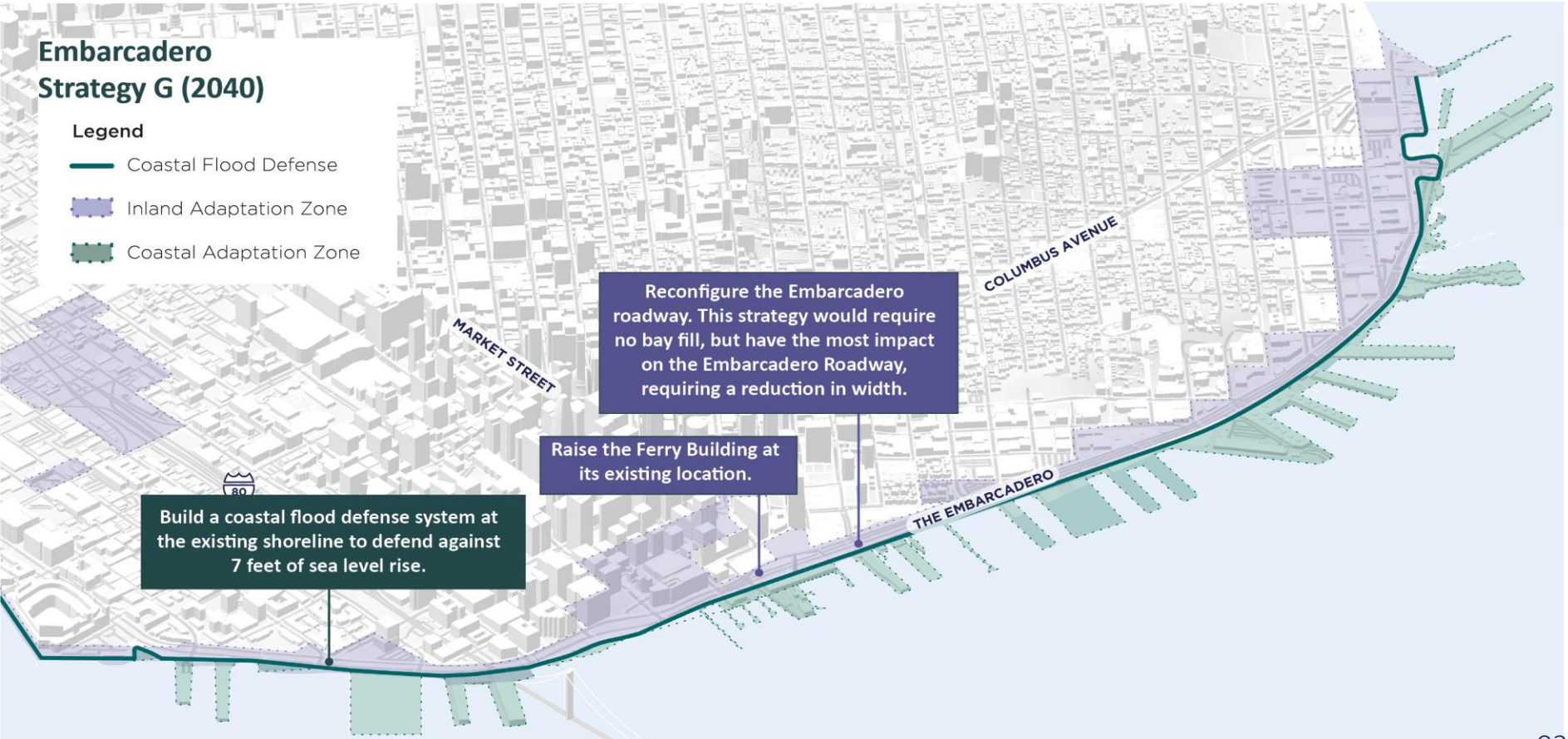
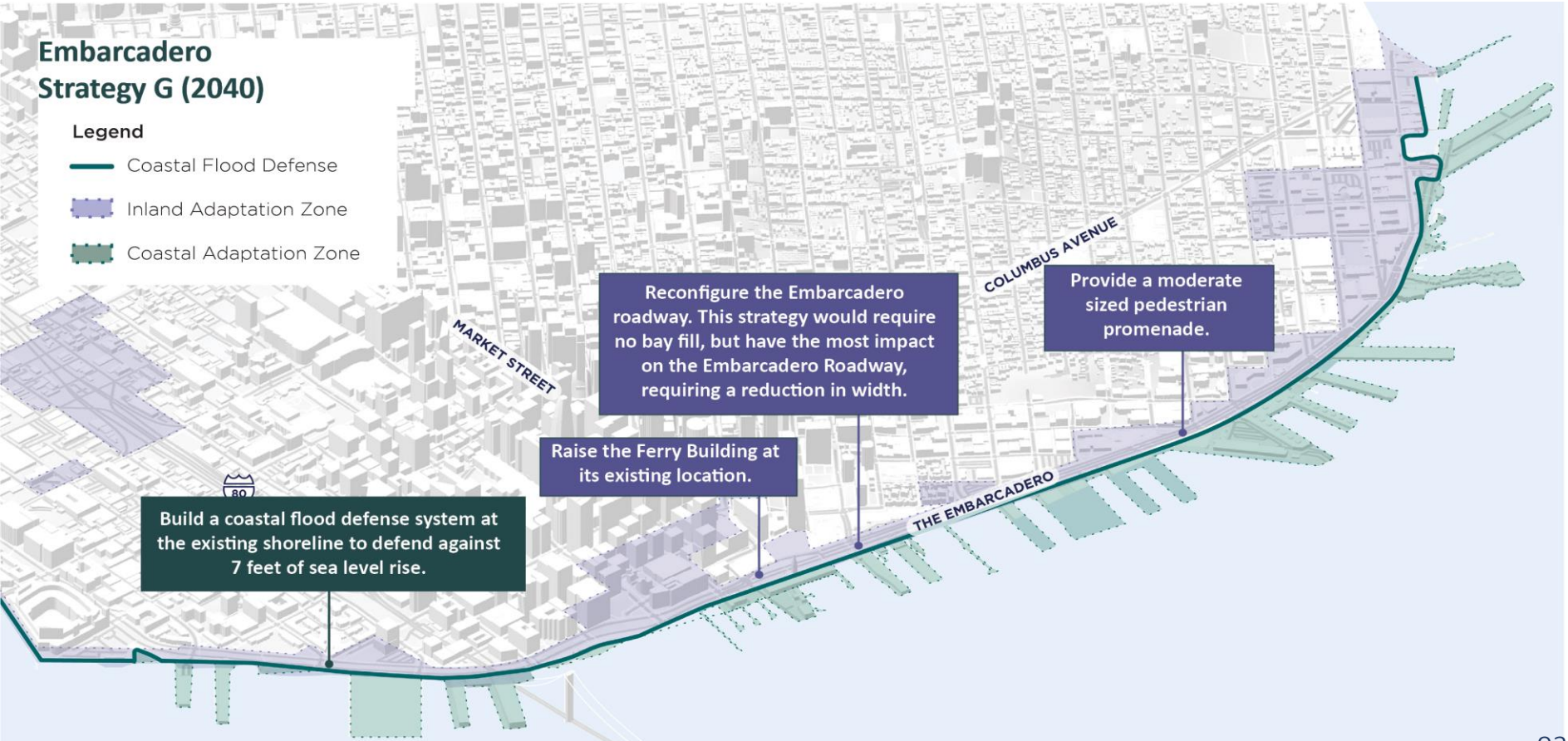
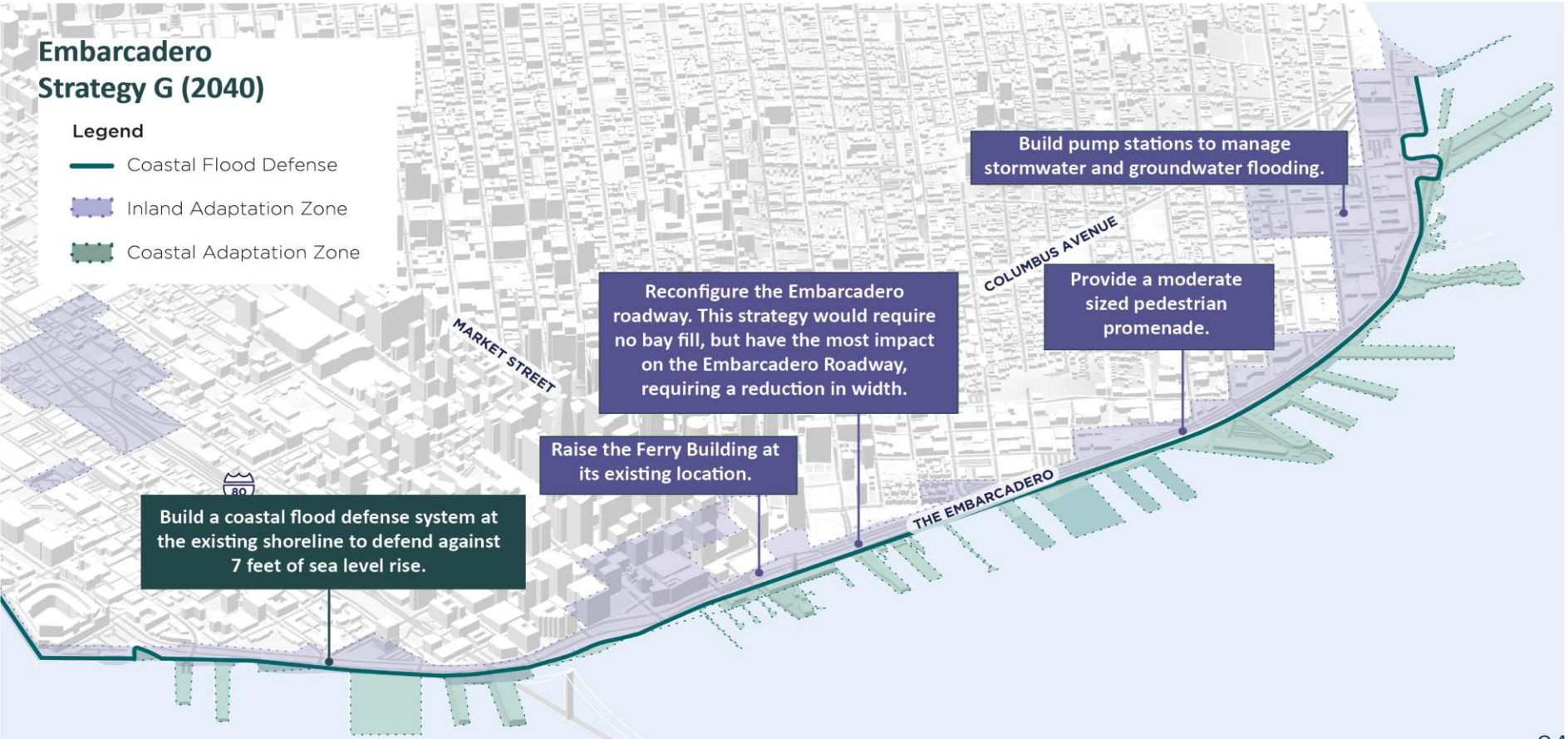
STRATEGY G – HIGHER SEA LEVEL RISE – ALIGN WITH WATERSHEDS



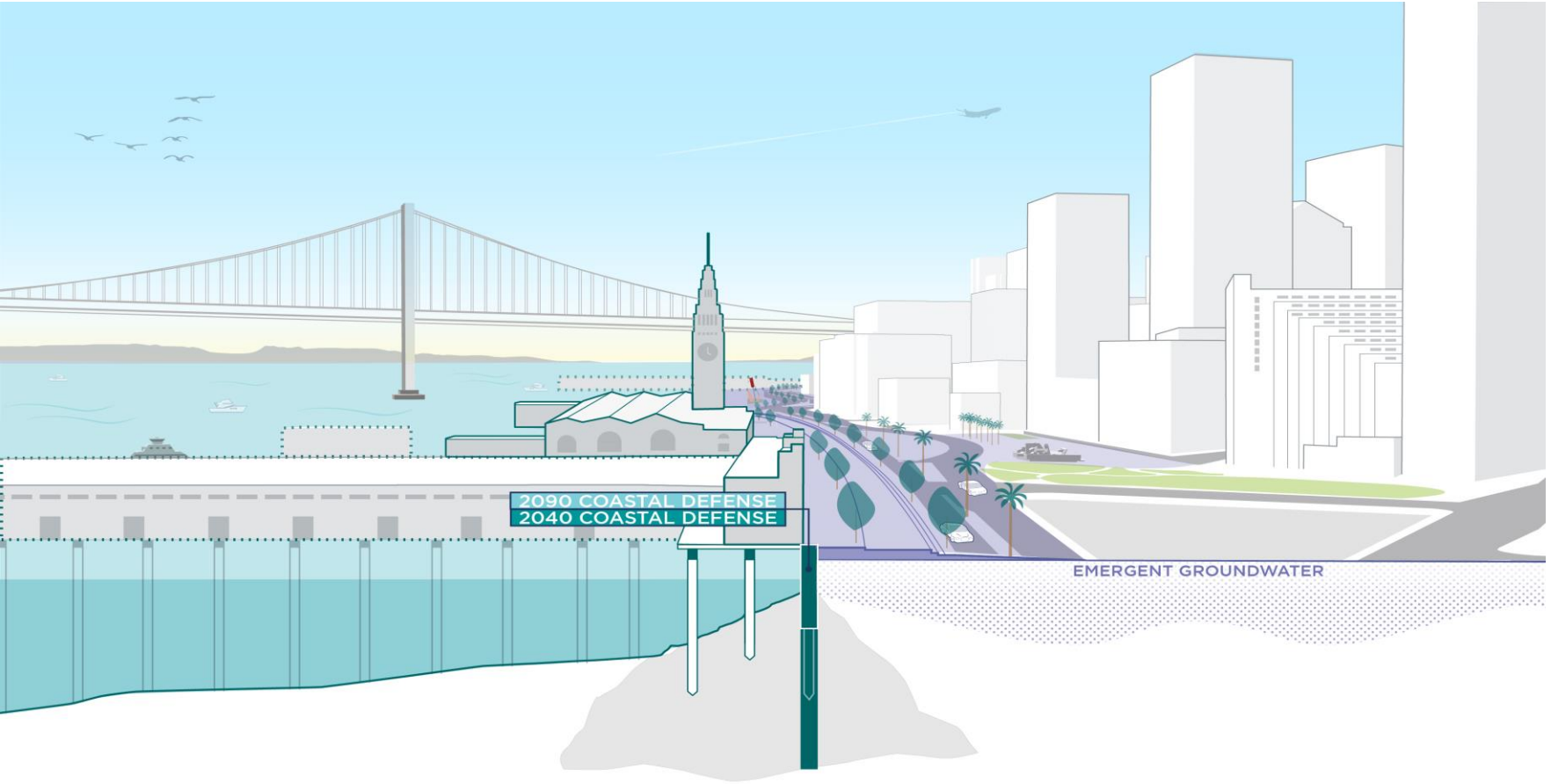
STRATEGY G – HIGHER SEA LEVEL RISE – ALIGN WITH WATERSHEDS



STRATEGY G – HIGHER SEA LEVEL RISE – ALIGN WITH WATERSHEDS

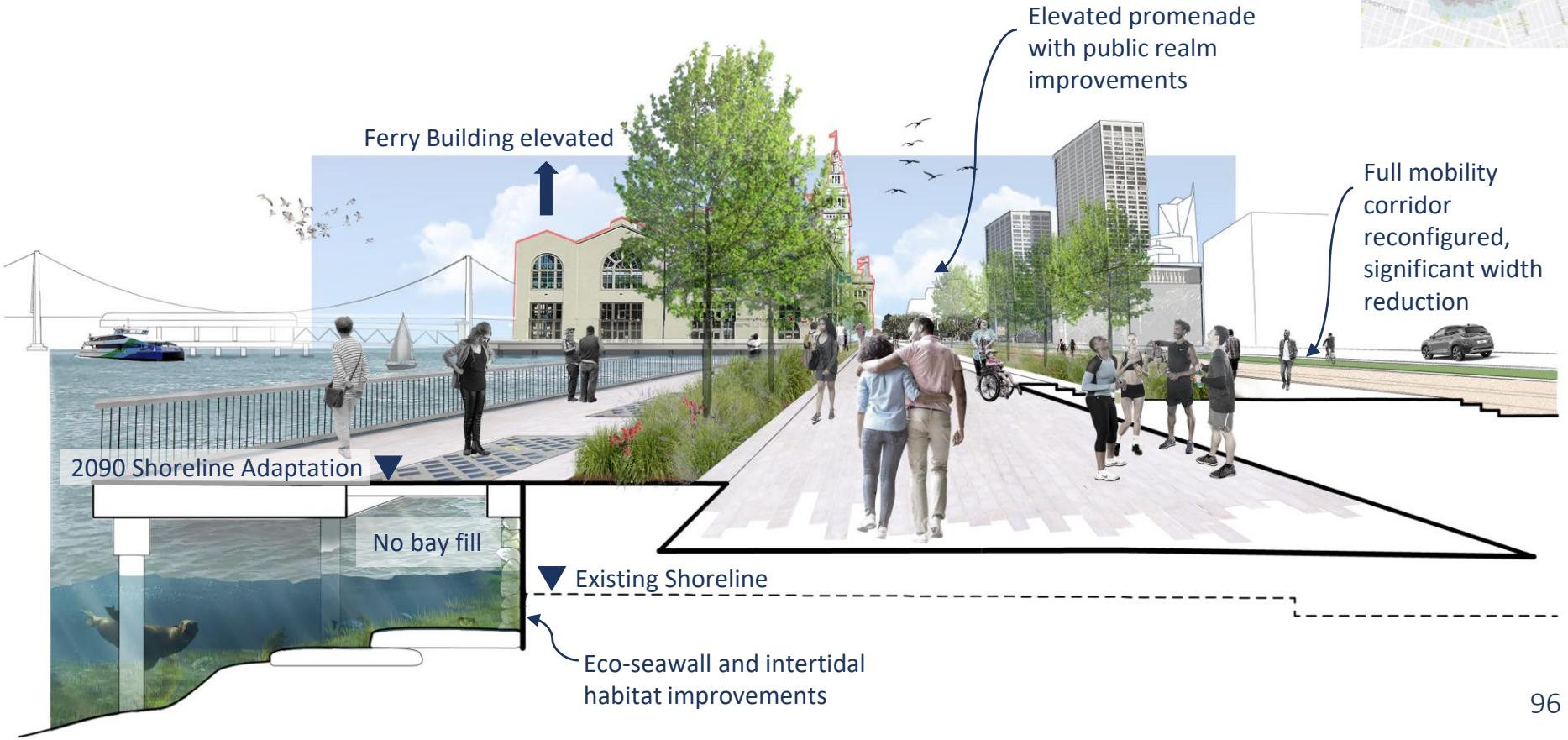


STRATEGY G – HIGHER SEA LEVEL RISE – ALIGN WITH WATERSHEDS



STRATEGY G – HIGHER SEA LEVEL RISE – ALIGN WITH WATERSHEDS

Embarcadero in 2040



POLL QUESTION #7

Strategy G would not use any bay fill, but because of the resulting limited space would require a full redesign to the existing Embarcadero roadway. The resulting design would result in a moderate public promenade and narrowed roadway (approximately one travel lane in either direction). Do you support this approach? (Select all that apply)

POLL QUESTION #8

All of these strategies defend against flood risks but do so in different ways. All present big changes, but they also bring big opportunities for public benefits. Now that you've seen these strategies for the Embarcadero, please rank the following opportunities:

Next Steps

DRAFT WATERFRONT ADAPTATION STRATEGIES DEVELOPMENT SCHEDULE

COMMUNITY ENGAGEMENT PLAN

OCT	NOV	DEC	JAN

- Materials Live on sfport.com/wrp
- Other Commission Meetings
- Community Workshops / Meetings
- In Person Outreach via Walking Tours and Waterfront Community Mixer
- Digital Engagement via StoryMaps
- Presentations to CACs, southern waterfront CBOs, etc.
- Focus Groups

WHAT WE'VE HEARD SO FAR

- Summer Survey of over 1000 respondents
- Openness to exploring many kinds of adaptation approaches (including more transformative options)
- Desire to preserve and expand connections between the city and the waterfront
- Curiosity about feasibility, cost, and disruption impacts

JOIN THE CONVERSATION

Different Options for Engaging

- Join us at another geography specific meeting for Islais Creek/Bayview and Mission Creek/Mission Bay – events through December 8
- Join us at the upcoming walking tour
  - Embarcadero Walking Tour this Saturday 11/19 10am-12pm
- Explore the online StoryMaps, digital storytelling and surveys
- See the full list of engagement opportunities and sign up: www.sfport.com/wrp/our-waterfront

POLL QUESTION #9

After this meeting how do you feel about these strategies and the work the Port and its federal and city partners are doing?

Thank You

Luiz Barata | luiz.barata@sfport.com

PORT OF SAN FRANCISCO

Waterfront Resilience Program

QUESTIONS & ANSWERS

- Type your question in the Chat box
- Use the "Raise Your Hand" button to ask a question off mute

Thank You

Luiz Barata | luiz.barata@sfport.com

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