OAAC Adapt
Oakland Alameda Adaptation Projects

Oakland-Alameda Estuary Community Engagement Workshop

December 5th, 2024

Agenda
Oakland-Alameda Estuary

01 **Welcome! Oakland Alameda Adaptation Projects Introduction**
Lauren Bergenholtz, CMG Landscape Architecture; Keta Price, The Hood Planner; Danielle Mieler, City of Alameda

02 **Regional Overview, Climate Science & Adaptation Planning**
Dr. Kris May, Pathways Climate Institute

03 **Q&A – Add your questions to the chat at any time!**
Dr. Kris May, Pathways Climate Institute; Lauren Bergenholtz, CMG

04 **Site Analysis**
Jamie Phillips, CMG Landscape Architecture

05 **Development of Adaptation Alternatives & Design Concepts**
Jamie Phillips, CMG Landscape Architecture

06 **Q&A – Add your questions to the chat at any time!**
Jamie Phillips, CMG Landscape Architecture; Lauren Bergenholtz, CMG

07 **Next Steps & Survey**
Lauren Eisele, CASA

OAAC Adapt: Project Partners

Agency Partners

CITY OF Oakland

ALAMEDA

East Bay Regional Park District

Alameda County Flood Control & Water Conservation District

Caltrans

California Water Boards San Francisco Bay - R2

Port of Oakland
Seaport. Airport. Everyone's Port.

Community Partners

STLT SOGOREA TE' LAND TRUST
LED BY URBAN INDIGENOUS WOMEN

CASA
Community Action for a Sustainable Alameda

SFEI AQUATIC SCIENCE CENTER
SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER

REAP CLIMATE CENTER

GREENBELT ALLIANCE

Ninth Root

Hood Planning Group

Consultants

cmg Landscape Architecture

ESA

moffatt & nichol

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

NHA | ADVISORS
Financial & Policy Strategies. Delivered.

Earth Mechanics, Inc.
Geotechnical and Earthquake Engineering

pathways
CLIMATE INSTITUTE

Oakland-Alameda Estuary Workshop Purpose

- Share information on what **sea level rise means for the Oakland and Alameda sub-region**
- Tools we can use make our **communities more resilient and transformative**
- Share development of **design concepts for near-term adaptation** of the Oakland-Alameda Estuary
- Answer your **questions** and get your feedback on your **concerns and aspirations for your community**

OAAC Adapt Overview

Oakland Alameda Adaptation Committee (OAAC):

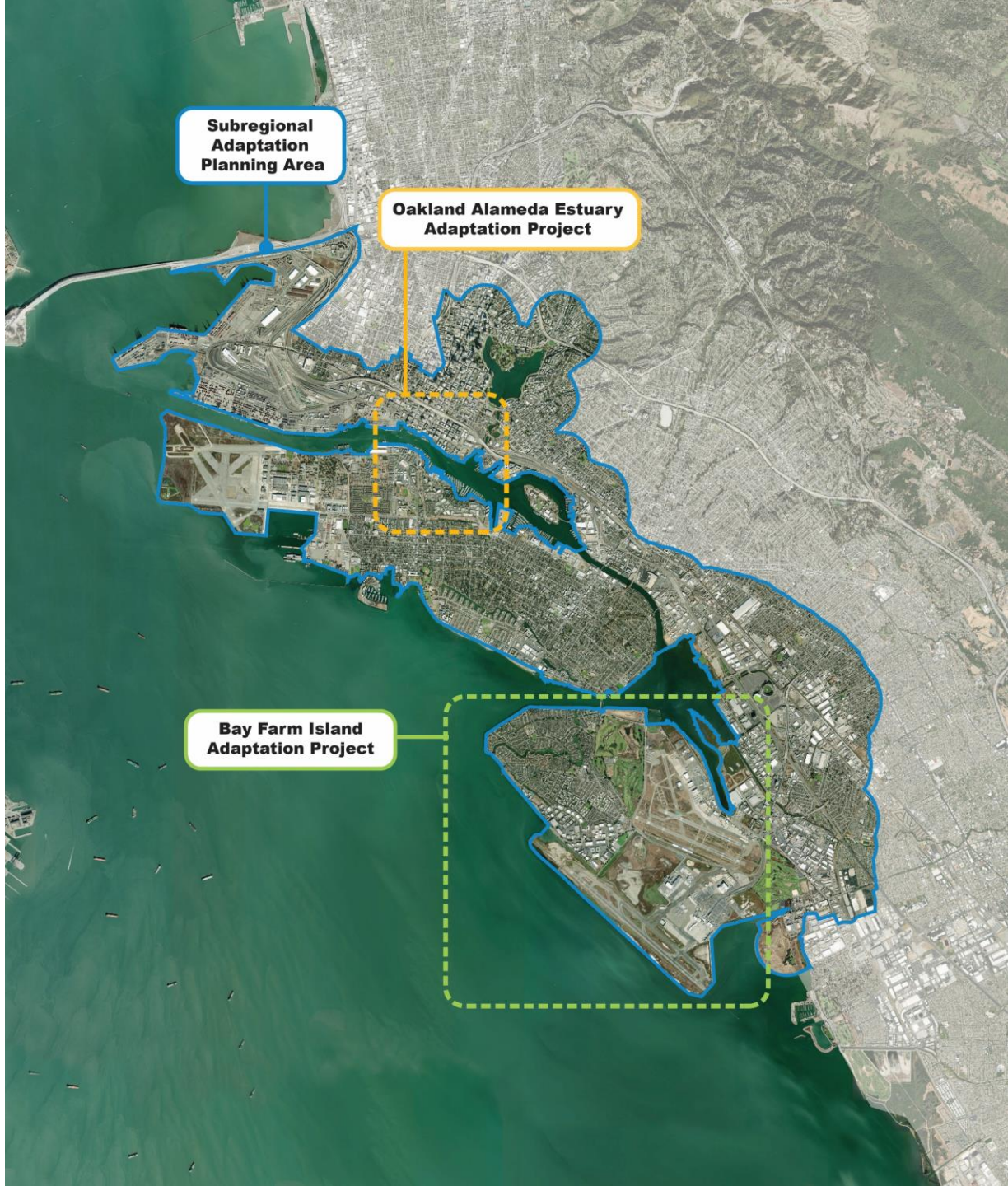
A coalition of shoreline community and agency partners working to coordinate the Oakland-Alameda sub-region flood and adaptation projects to protect and restore water quality, habitat, recreation and community resilience.

OAAC ADAPT Projects

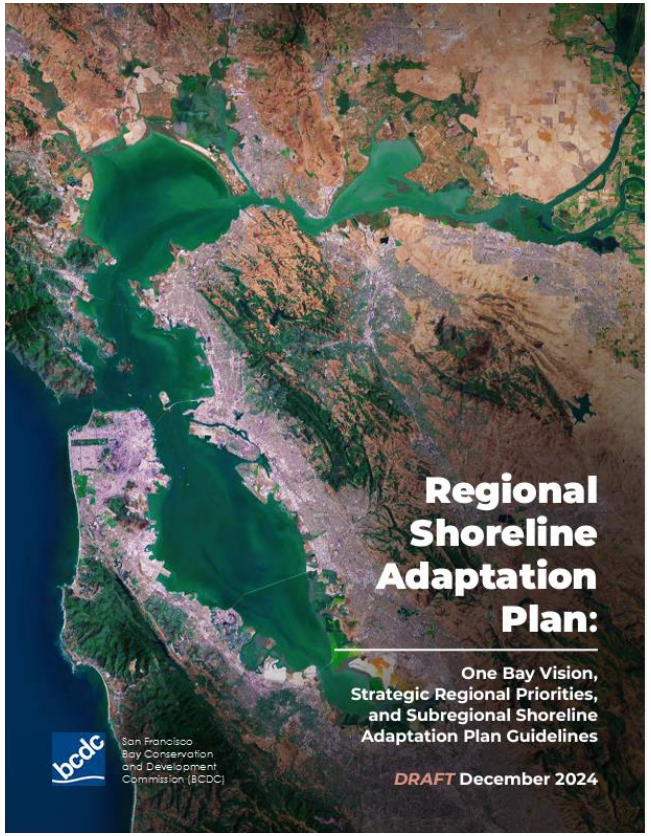
- The **Subregional Adaptation Plan** is a long-term plan that details preliminary strategies and pathways for shoreline communities to take as the climate and shorelines change over time

- The **Oakland Alameda Estuary Project** is a near-term sea level rise adaptation design concept to address increased coastal, stormwater, and groundwater flooding for up to two feet of sea level rise over the coming decades

- The **Bay Farm Island Adaptation Project** is a near-term sea level rise adaptation design project to address compound flooding and up to two feet of sea level rise and long-term planning coordination.



Other Adaptation Partner Projects in the Sub-Region



OAAC Subregional Goals

1. **Protect** Oakland-Alameda sub-region from the negative effects of expected sea level, inland flooding, and groundwater rise and liquefaction

2. Identify and develop opportunities for **multi-benefit** adaptations strategies

3. Avoid negatively affecting **neighboring subregions** through protection and adaptation measures

4. Utilize an **adaptation pathways** approach to address different SLR thresholds and time horizons. Identify near, mid, and long-term adaptation strategies

5. Enhance **transportation**, **recreation** corridors, **bay access**, and the San Francisco **Bay Trail**

6. Preserve and increase **open space** where possible

7. Improve subtidal, intertidal, transitional, and upland habitat with **nature-based solutions**

8. Improve **air quality**

Ground Rules

- Engage in **active** listening
- Seek first to **understand**, not to be understood
- No one or two individuals should dominate the **conversation**
- Engage in your realm of experience and expertise, and **respect** and engage others in theirs
- Take **ownership** for positive outcomes
- No bad ideas – let's make this a "**yes, and…**" space

Project Schedule

2023 FALL | 2024 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC | 2025 JAN FEB MAR APR MAY JUNE JULY AUG SEPT

Planning Principles, Analysis and Criteria | **Strategy Foundation** | **Strategy Development & Stakeholder Input** | **Strategy Refinement** | **Plan Completion & Council Hearings**

Long-Term Subregional Adaptation Plan

Existing Conditions & Analysis | **Develop Alternatives** | **Alternative Refinement & Stakeholder Input** | **Preferred Concept** | **30% Design Development of Preferred Concept** | **30% Design Completion & Council Hearings**

Near-Term Bay Farm Island Adaptation

We are here!

Existing Conditions & Analysis | **Develop Alternatives** | **Altenative Refinement & Stakeholder Input** | **Final Concept Development** | **Final Concept & Council Hearings**

Project Grant Deadline Feb 2025

Community Engagement Event

Near-Term Oakland Alameda Estuary Adaptation

Oakland Alameda Estuary
REAP Climate Center 8/3/24

Bay Farm Island
Leydecker Park 8/12/24

Oakland Alameda Estuary
Jack London Square 8/15/24

Next Steps & Call to Action

Stay engaged! Bring your voice (and your friends) to the table. We will need community involvement and input to advance this work. **Please join us at the following events:**

City of Alameda (attend virtually or in person)

- Commission on Persons with Disabilities - December 11th at 6:30pm
- Planning Board - Dec 16th at 7 pm
- City Council - Jan 21st at 7 pm

Community Groups

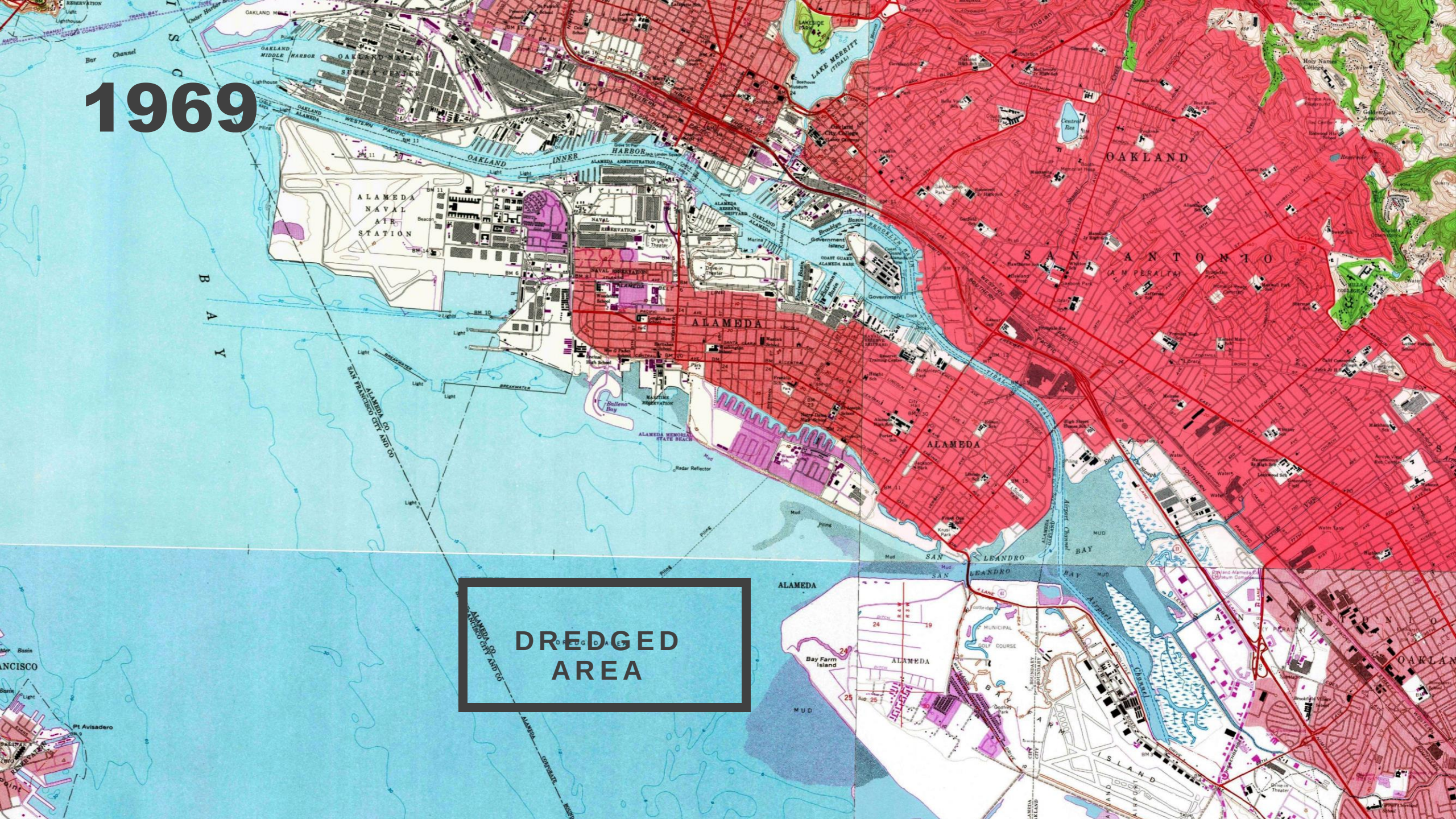
- King Tides Walk with CASA – December 14, 2024 / Crab Cove
- Ninth Root and Sacred Spaces engagement events

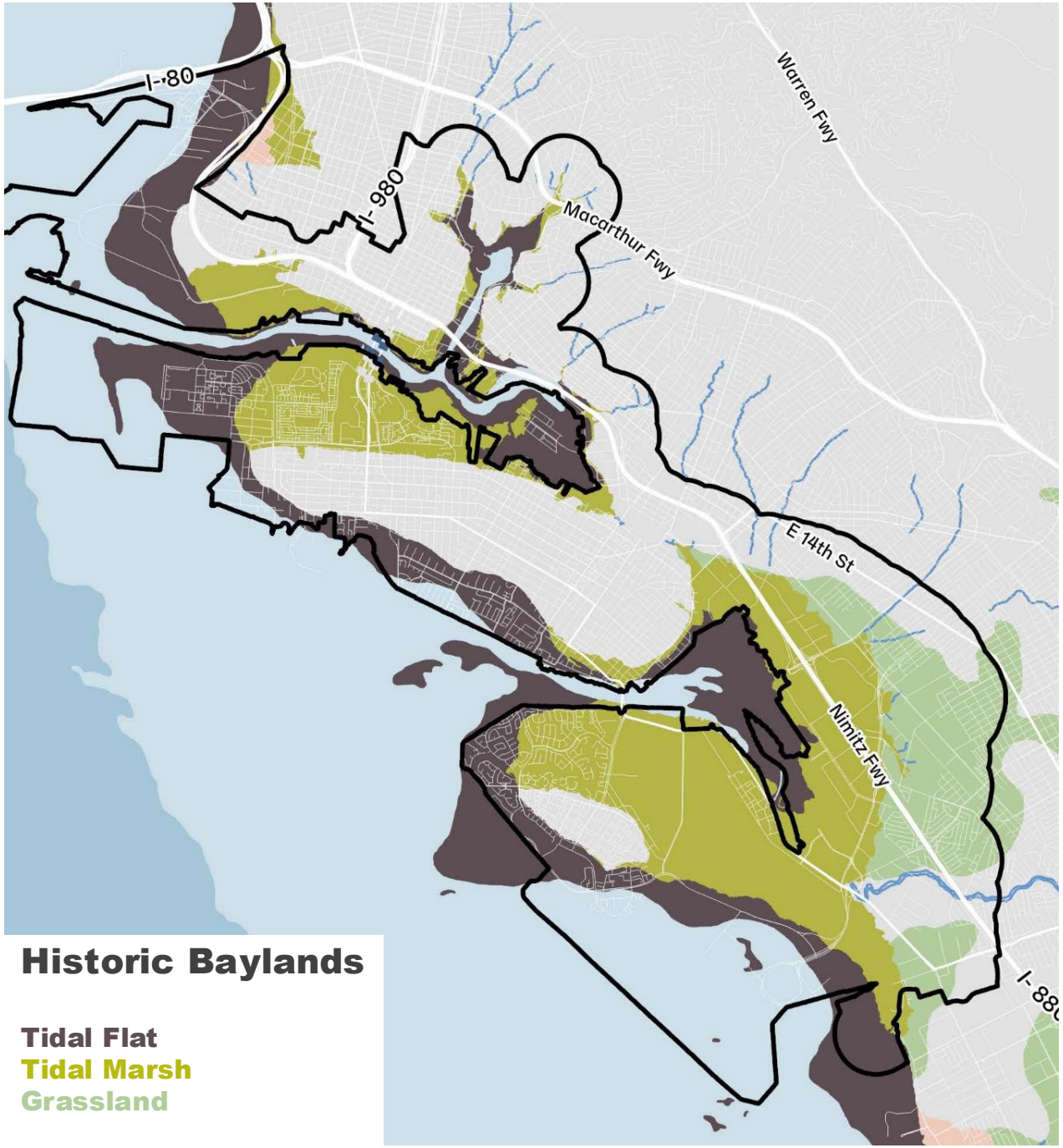
Future OAAC ADAPT Events

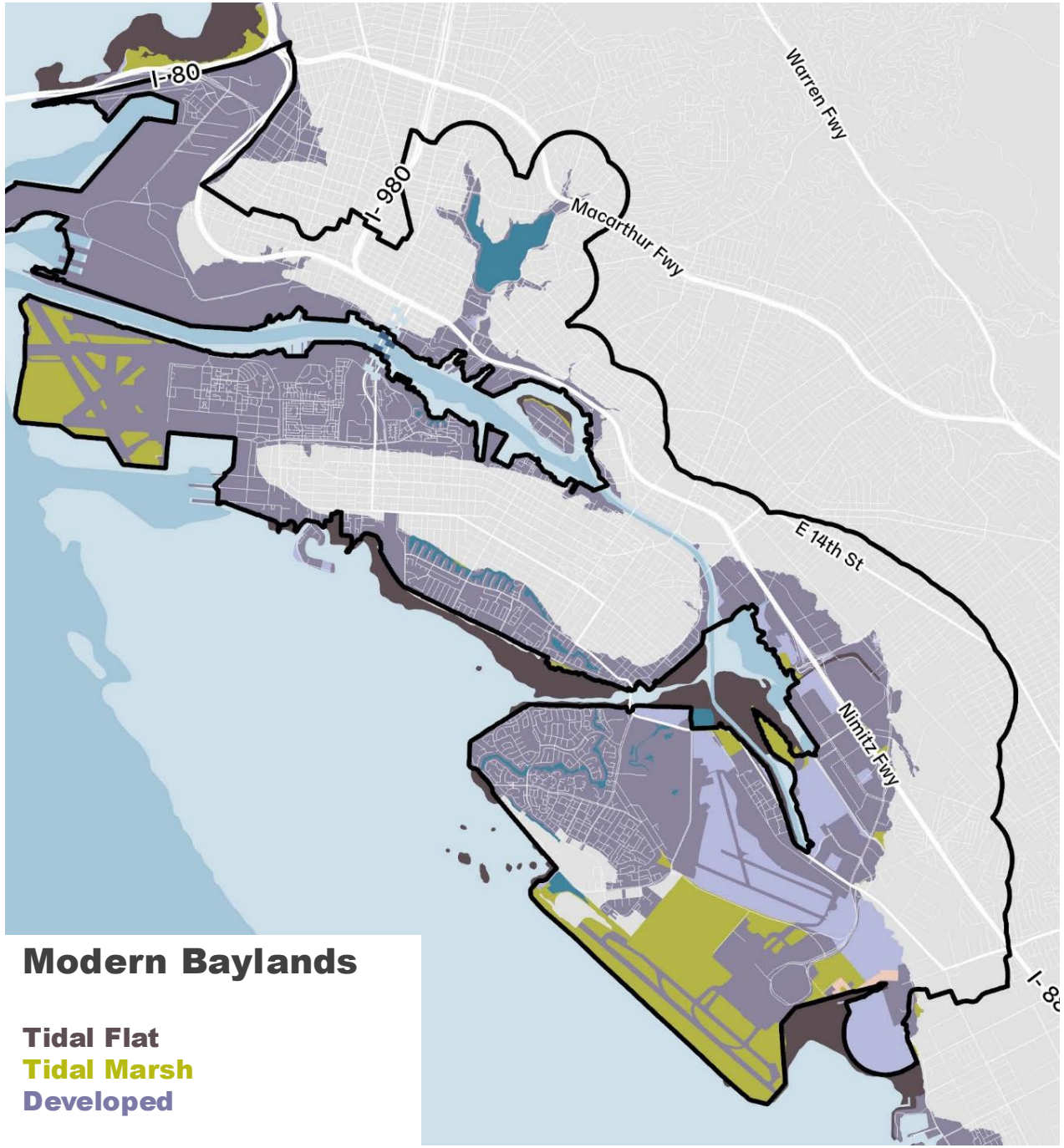
- Join us in Spring 2025 for community workshops on the long-term plan! Check out the OAAC Adapt website for more information: https://www.oaacadapt.org/

Past Change


1895
Gibbon Pt.
LIGHT
Deep Water Channel
S.P.R.R. NARROW GAUGE
San Antonio Creek
S.P.R.R. LIVERMORE LINE
Lake Merritt
OAKLAND
Indian Gulch
Oakland Harbor
ALAMEDA
Fruitvale
Rincon Pt.
Steamboat Pt.
Mission Rock
Potrero Pt.
BOUNDARY LINE
Hunter Point
Avisadero Pt.
San Leandro Bay
Bay Farm Island
SOUTHERN
San Leandro
Fitchburg
East Creek


1969
DREDGED AREA
ALAMEDA
OAKLAND
SAN ANTONIO
ALAMEDA NAVAL AIR STATION
OAKLAND NAVAL SUPPLY CENTER
LAKE MERRITT (TIDAL)
BAY
SAN LEANDRO BAY
Bay Farm Island
Pt Avisadero


I-80
I-980
Warren Fwy
Macarthur Fwy
E 14th St
Nimitz Fwy
I-88
Historic Baylands
Tidal Flat
Tidal Marsh
Grassland

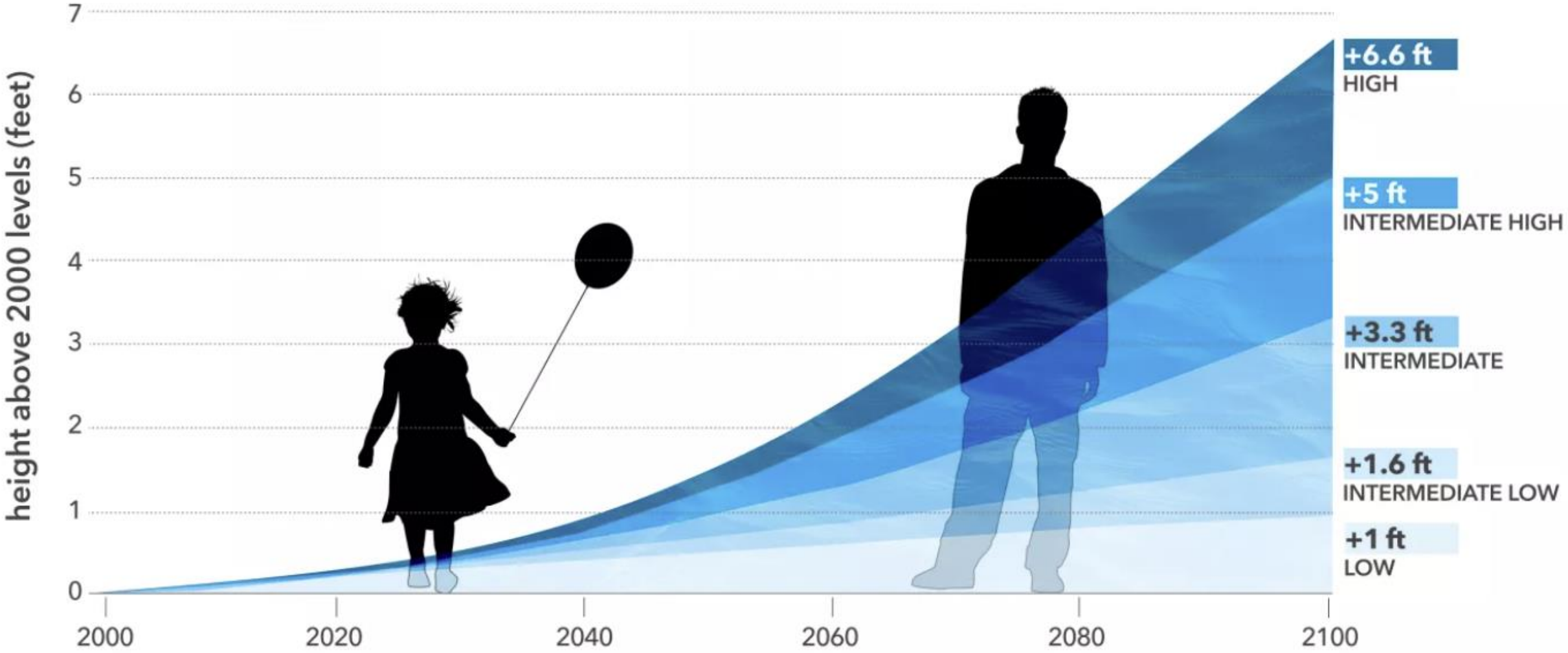

I-80
I-980
Warren Fwy
Macarthur Fwy
E 14th St
Nimitz Fwy
I-8
Modern Baylands
Tidal Flat
Tidal Marsh
Developed

Future Change

Our Climate is Changing

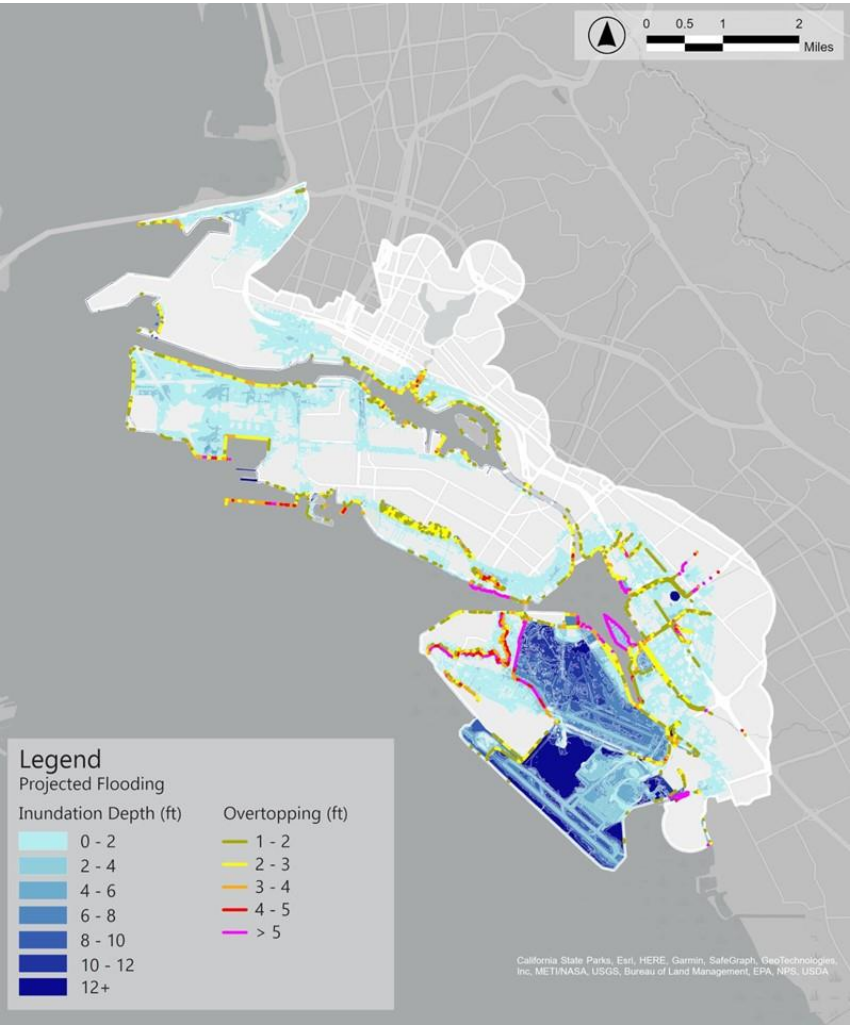
North of the Bay Bridge Touchdown

Projected Global Sea Level Rise to the Year 2100

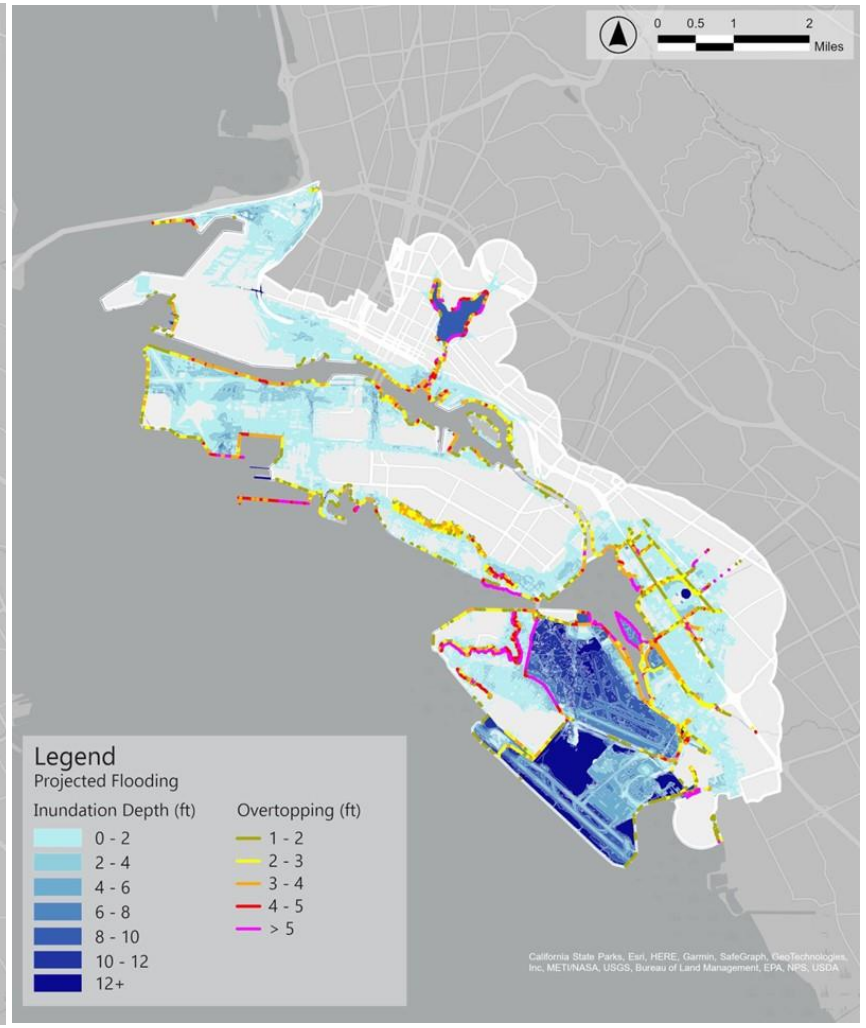


Source: climate.gov

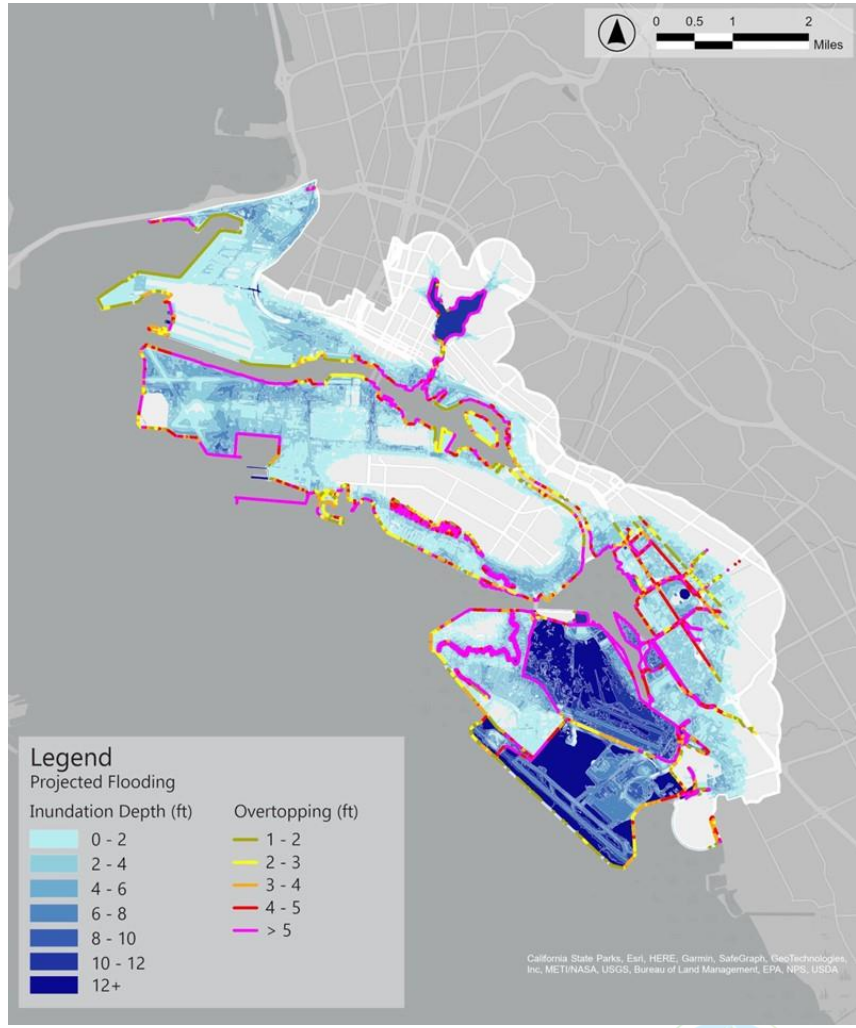
Coastal Flooding



2 ft of sea level rise +
100-year event



3 ft of sea level rise +
100-year event



5½ ft of sea level rise +
100-year event

High tides are already getting higher, groundwater is rising, and rainfall intensity is increasing.

Bay Farm Island near Veterans Court and the Harbor Bay Club

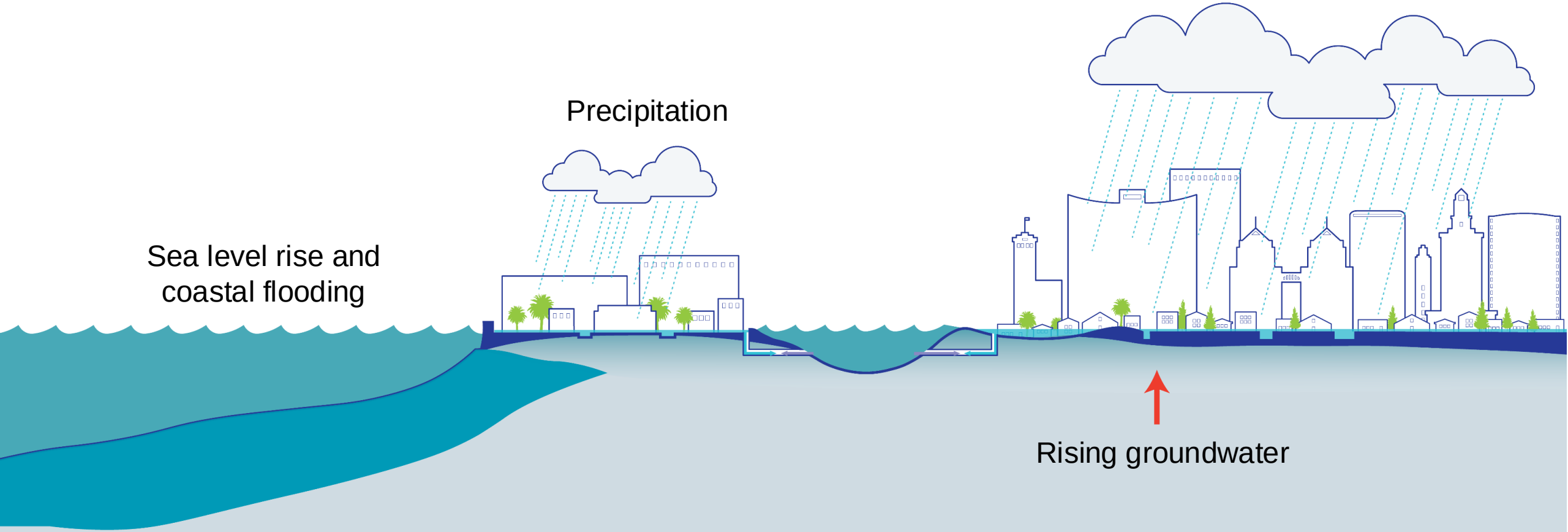
Embarcadero West Bridge over Lake Merritt Channel

Fernside Road, Alameda (Jan 1, 2023)

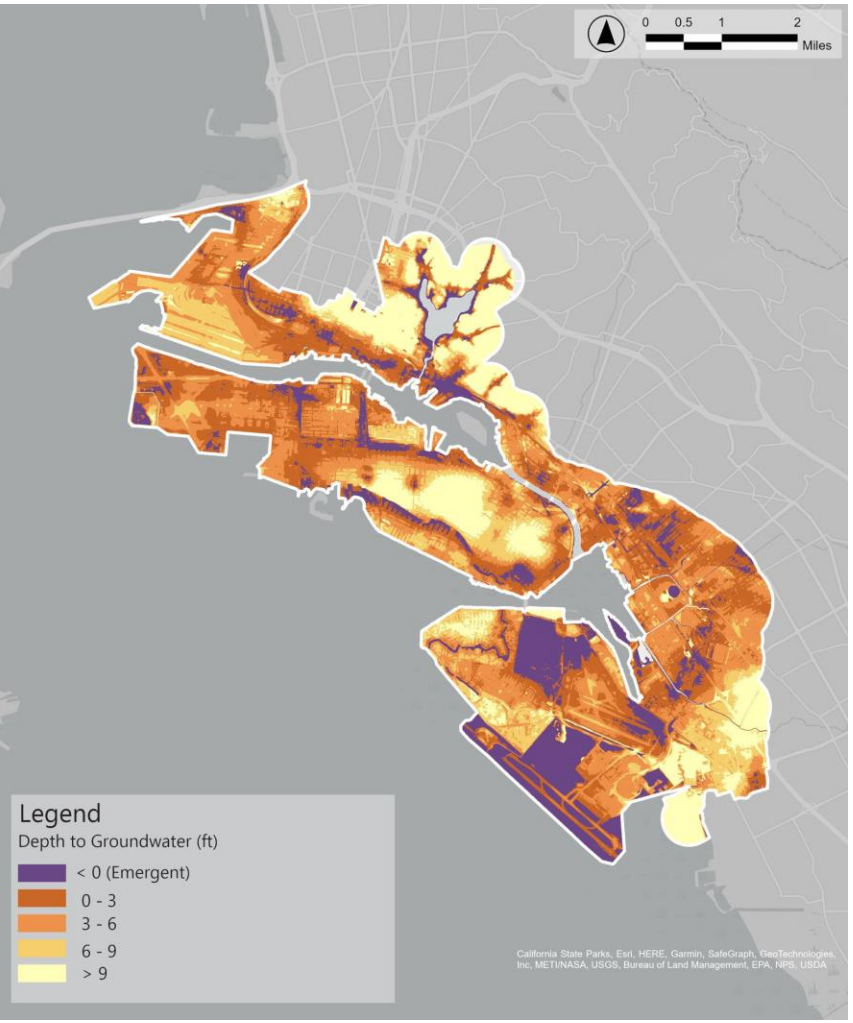
Sea View Park, Bay Farm Island

Low-lying coastal areas built on fill are at the greatest risk.

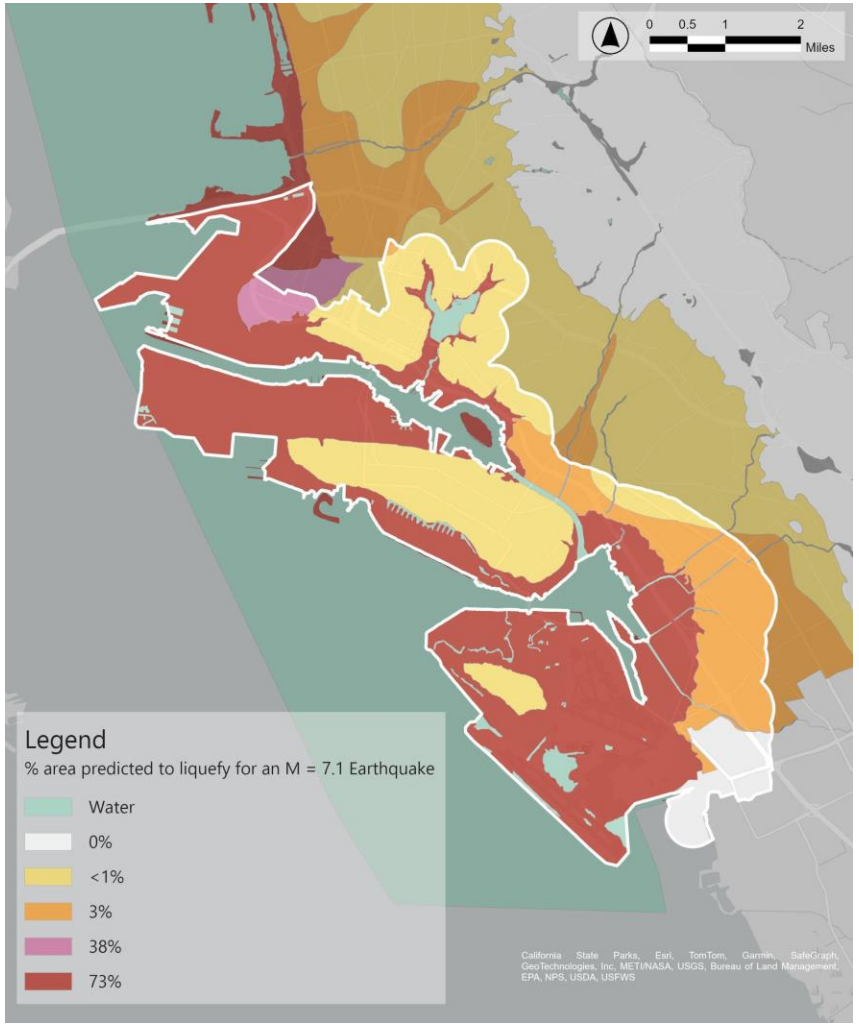
Combined Flooding:
A complex problem for adaptation



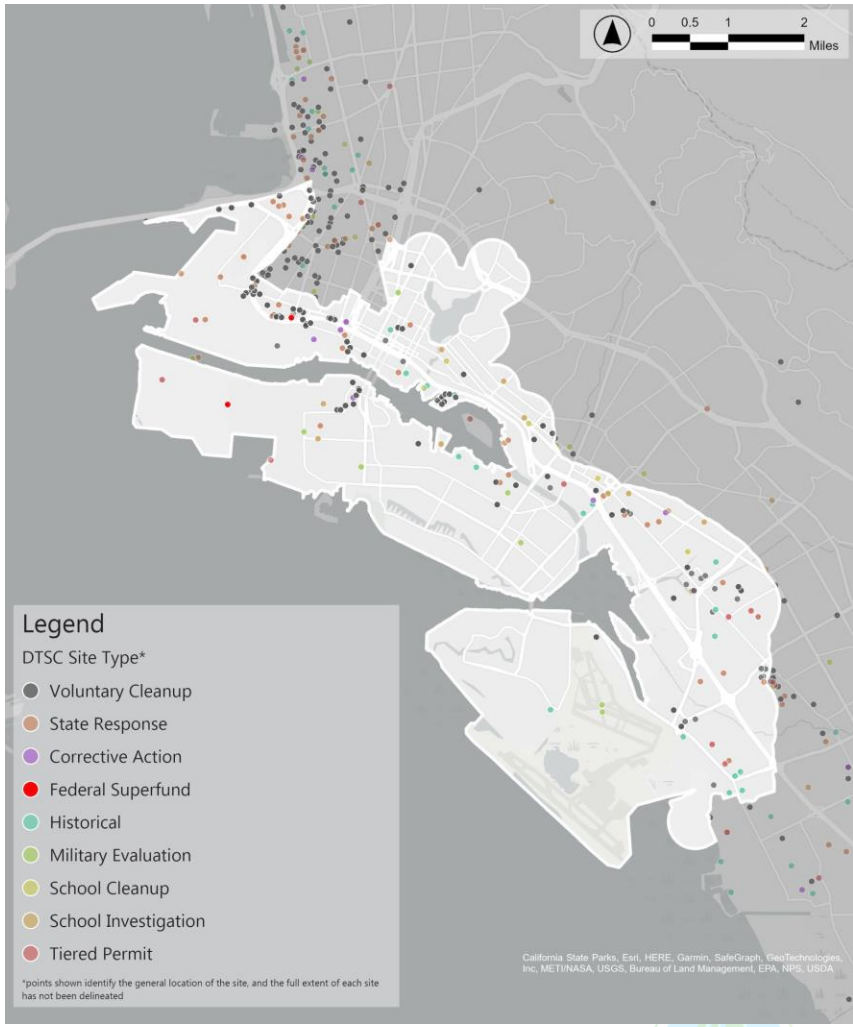
Rising Groundwater, Liquefaction, Contamination



Depth to Groundwater with 3 ft of Sea Level Rise



Liquefaction



Potentially Contaminated Sites (DTSC)

Sea Level Rise Project Criteria

Near Term

2060 - 2080
35 to 50-year adaptation project lifespan

2' of sea level rise

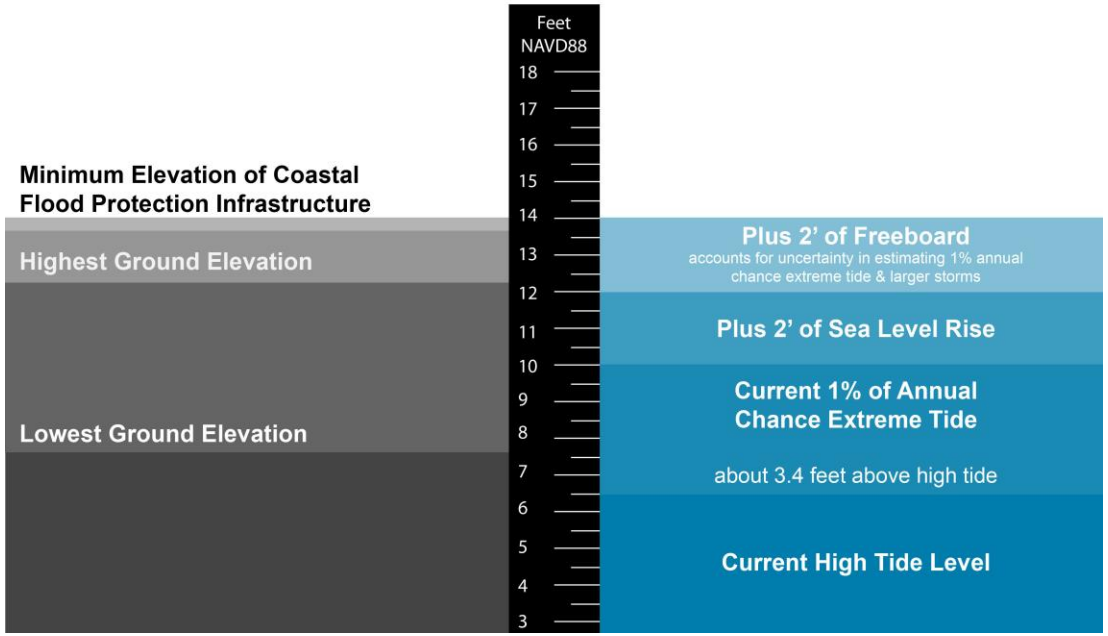
Protect to elevation +14’

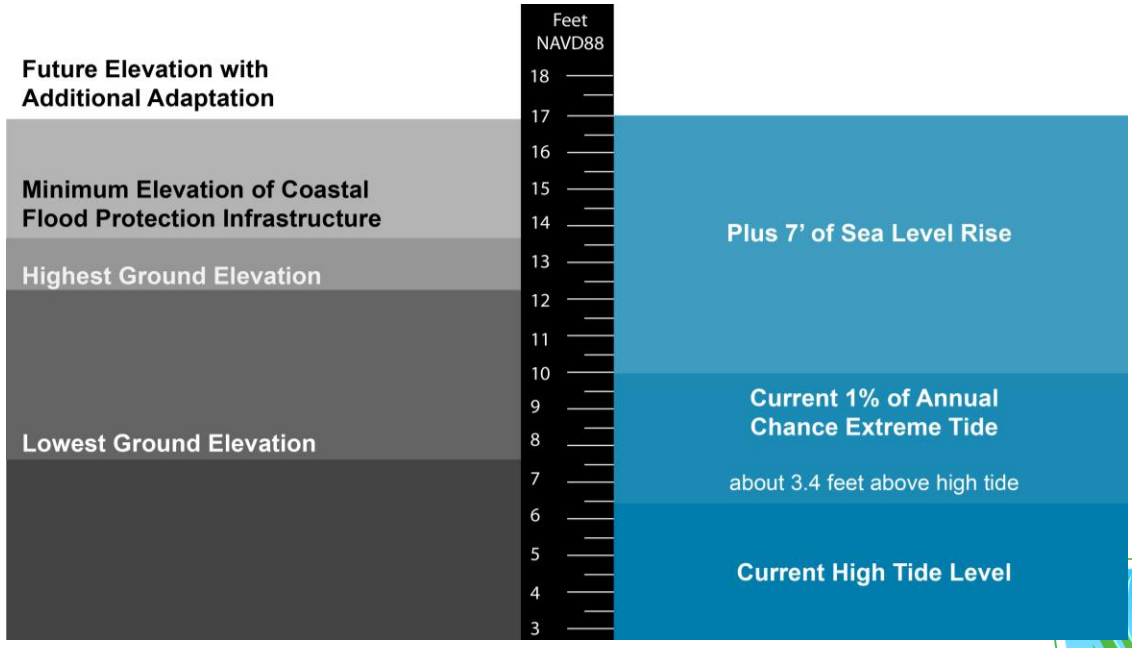
Long Term

2100+
Build upon near term projects

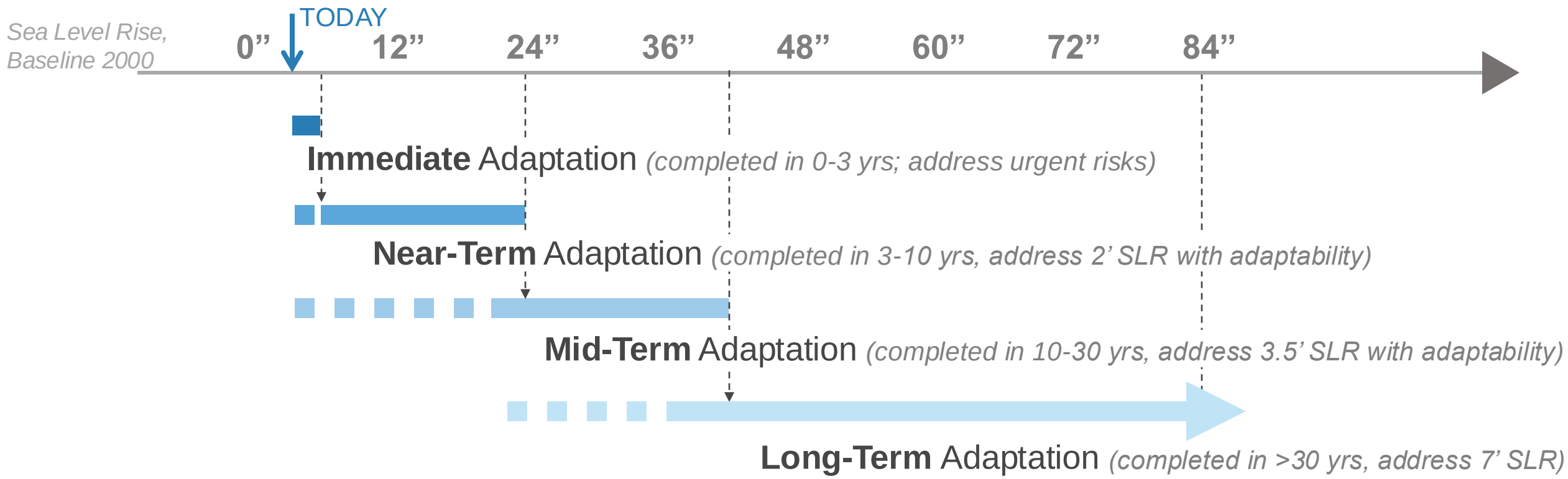
3.5 - 7' of sea level rise

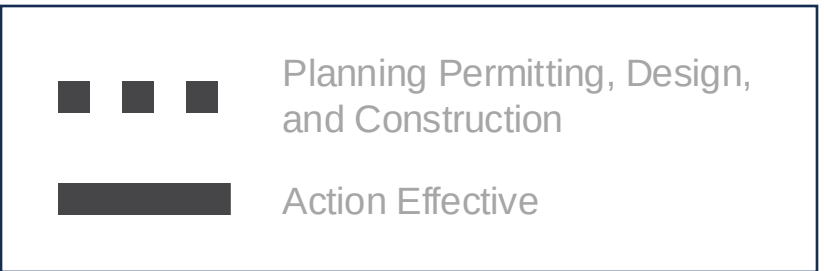
Protect to elevation +17’





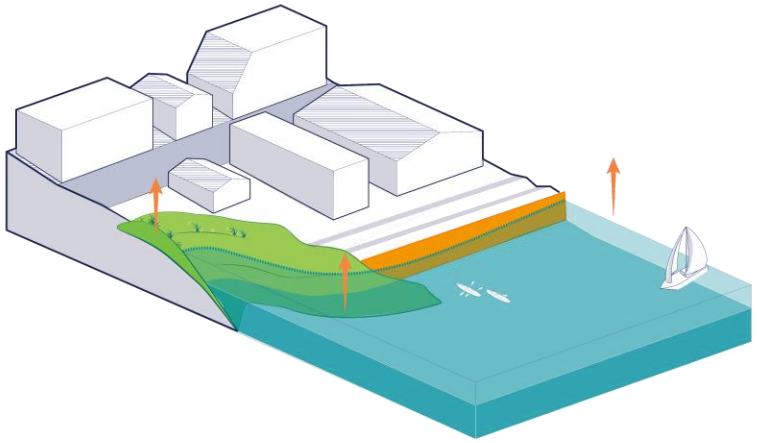
WHEN do we need to act – in terms of sea level rise?



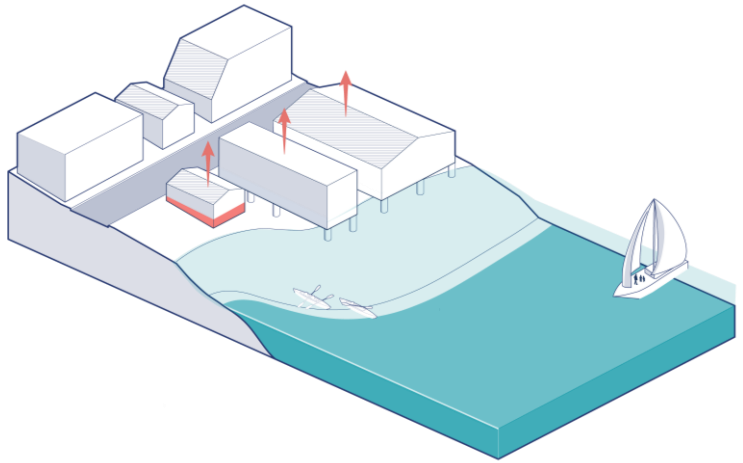


What Can We Do?

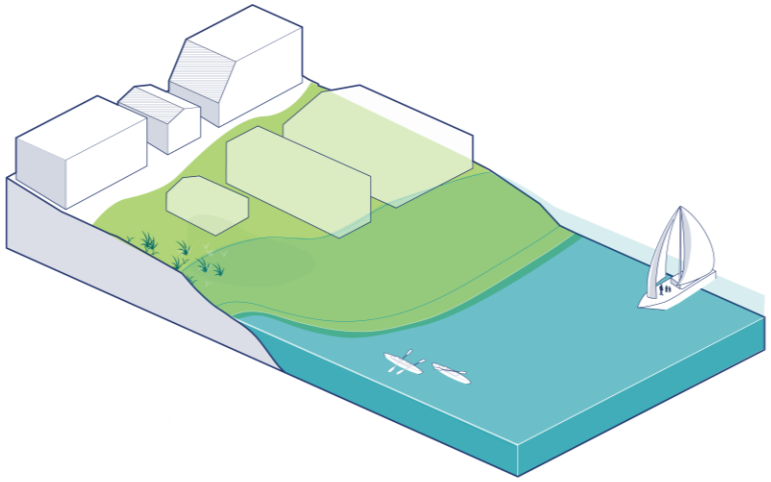
Adaptation Approaches



Protect: Elevate the shoreline to keep the coastal water out

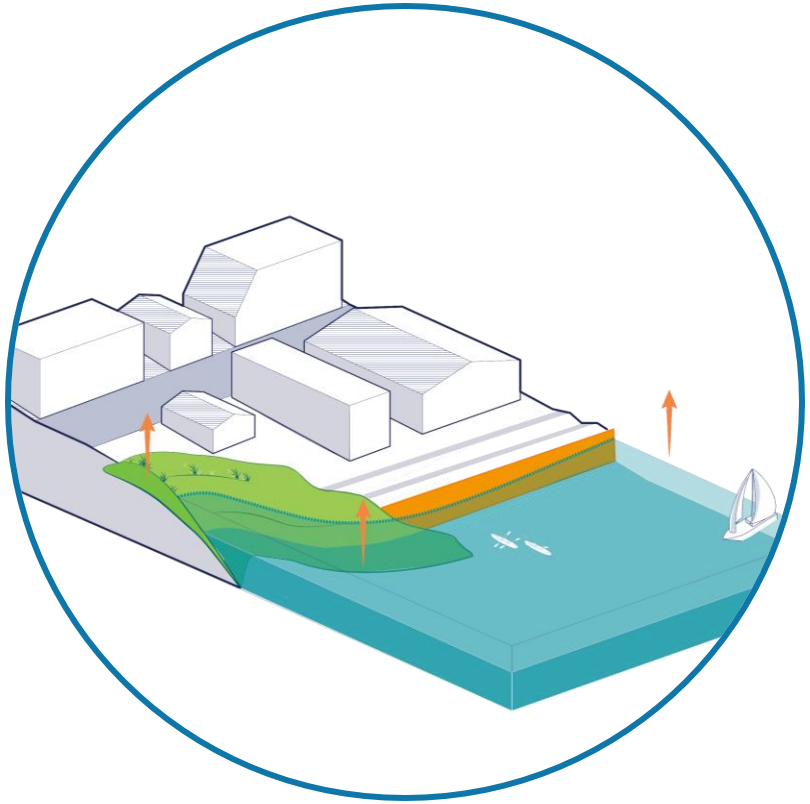


Accommodate: Let coastal water in, adapt buildings and infrastructure (elevate or flood proof)



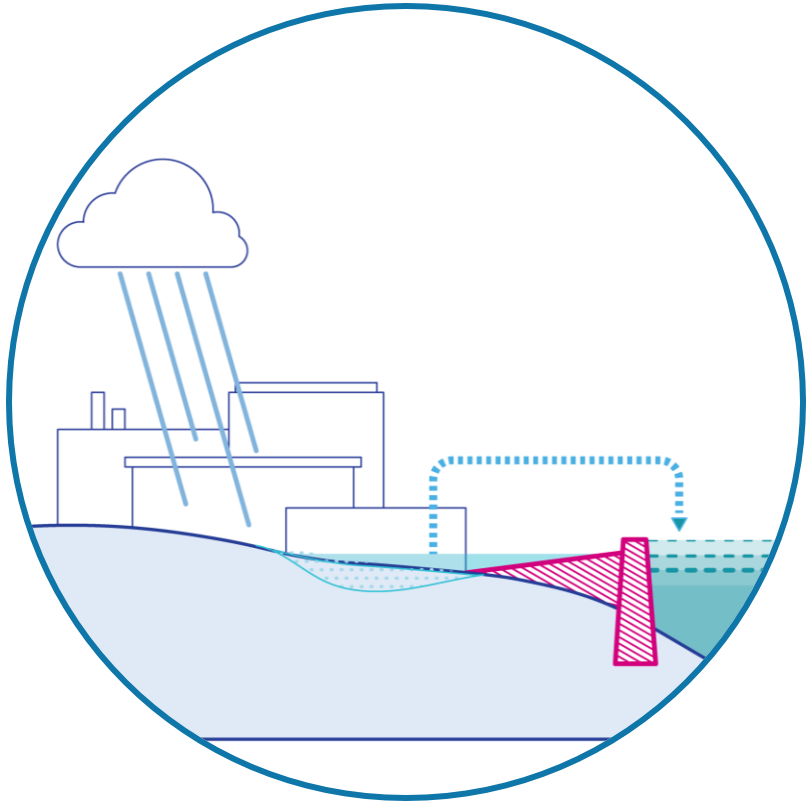
Retreat or Avoid: Move out of the area over time

Combined Adaptation



Shoreline elevation to prevent coastal flooding from sea level rise and storm surges

+



Inland adaptation (green and grey infrastructure) to manage stormwater and groundwater

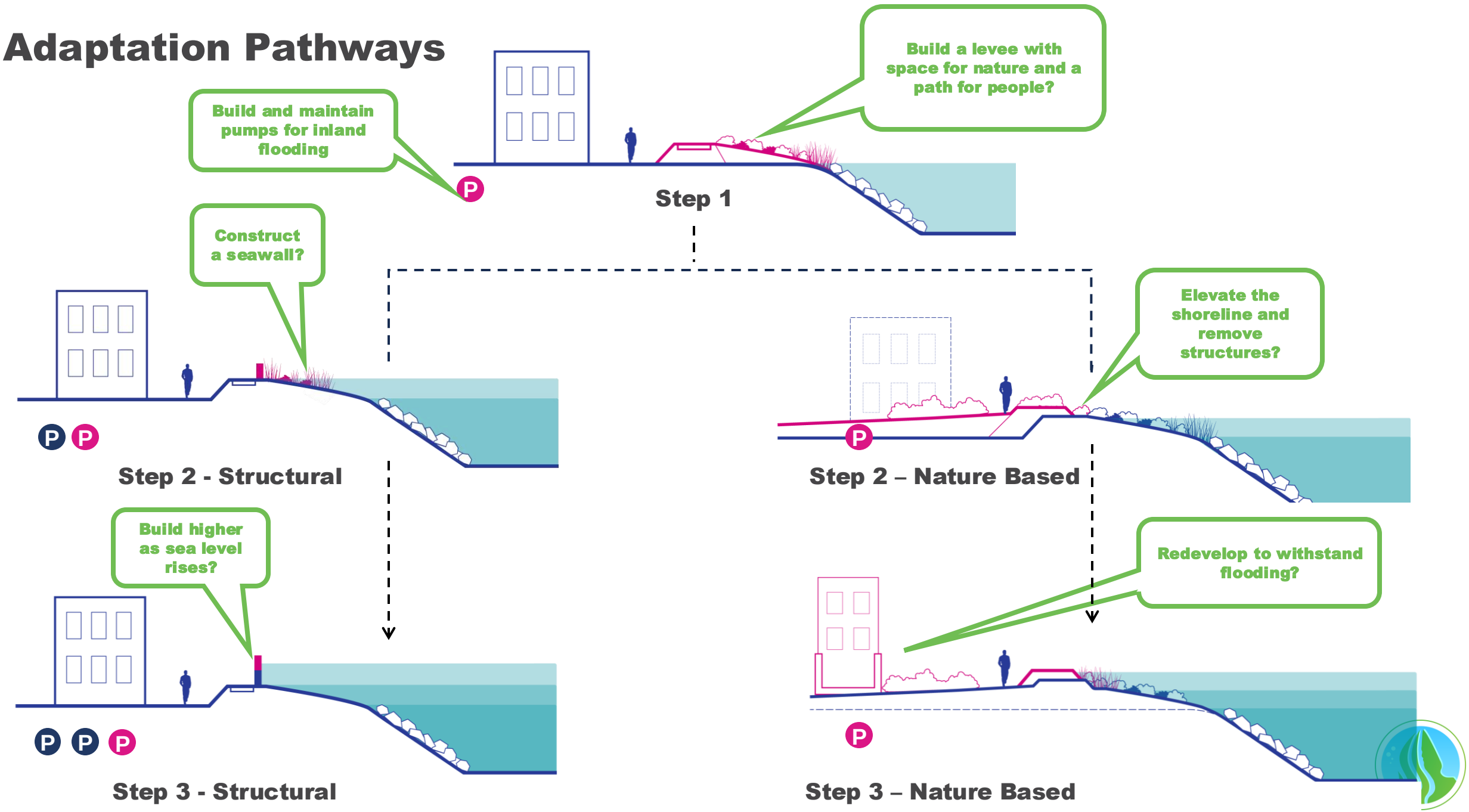
How open are we to people and places changing?

Resistance **Transformation**

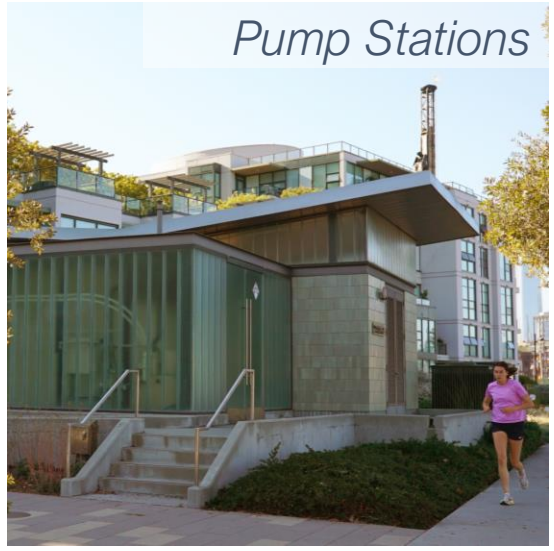
“We cannot solve our problems with the same thinking we used when we created them.”

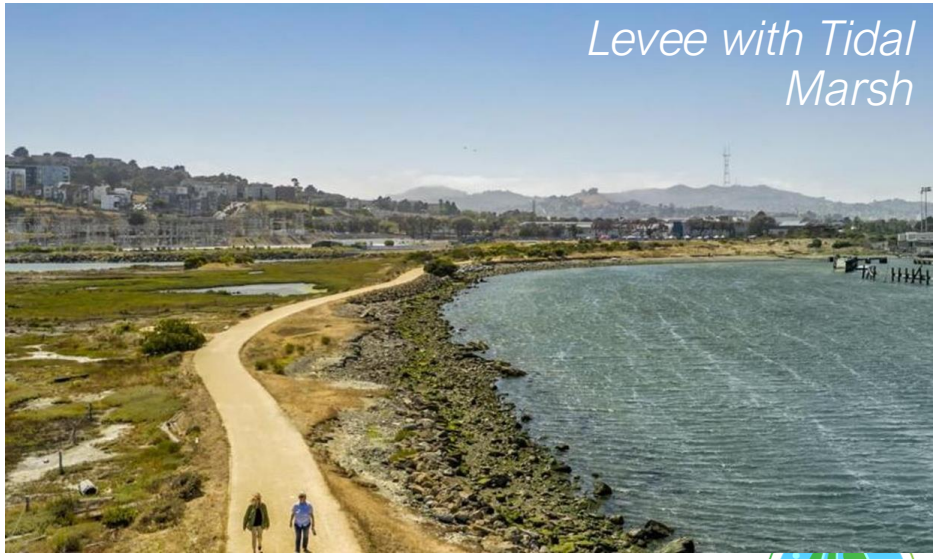
Often attributed to Albert Einstein (no direct source)

Adaptation Pathways



Potential Adaptation Measures





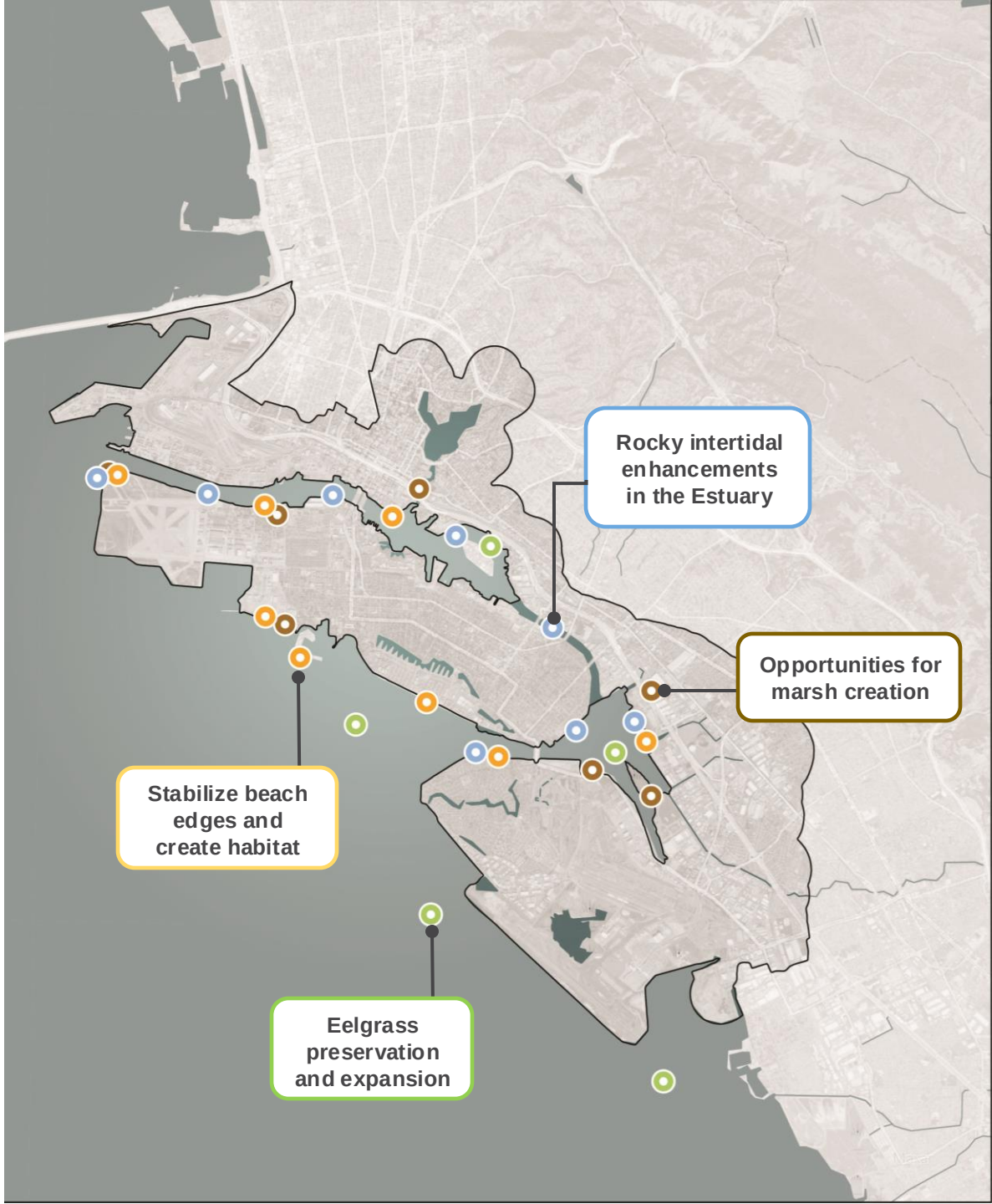
Opportunities to Grow Ecological Health & Habitat

Building on existing and historical habitat conditions in the near term

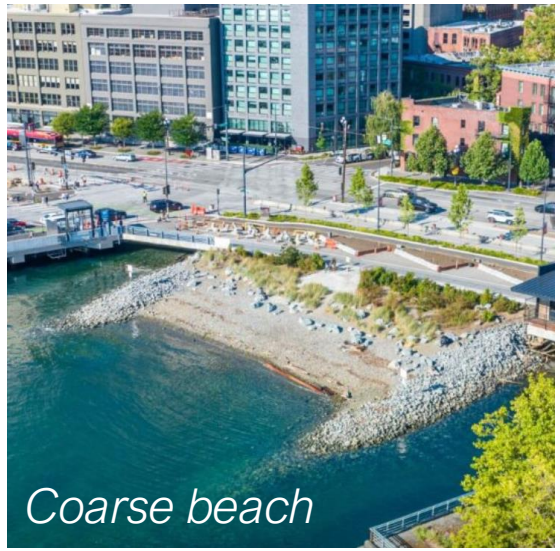
- Marsh and uplands transitions including marsh construction and preservation of existing marsh edge
- Beach stabilization and habitat improvements
- Eelgrass preservation and expansion
- Rocky intertidal enhancements such as living seawalls, enhanced riprap planting, tidepool and oyster bed creation

Existing eroding marsh edge along north shore of Bay Farm Island

Sand beach and debris preserving marsh edge and pond habitats within Elsie Roemer preserve.

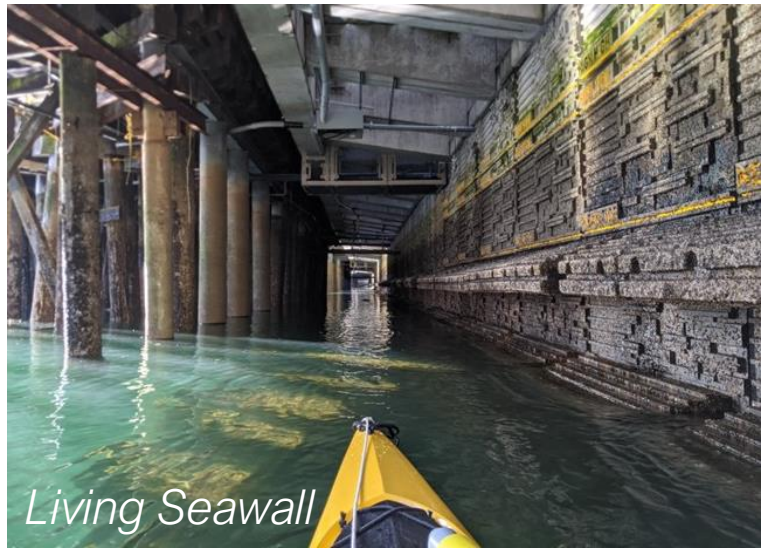


Natural & Nature-Based Features


Coarse beach


Gravel Beach and
Rocky Intertidal Habitat


Cobble Marsh


Living Seawall


Habitat Panels


Rock and Log Groynes and Beach Protection

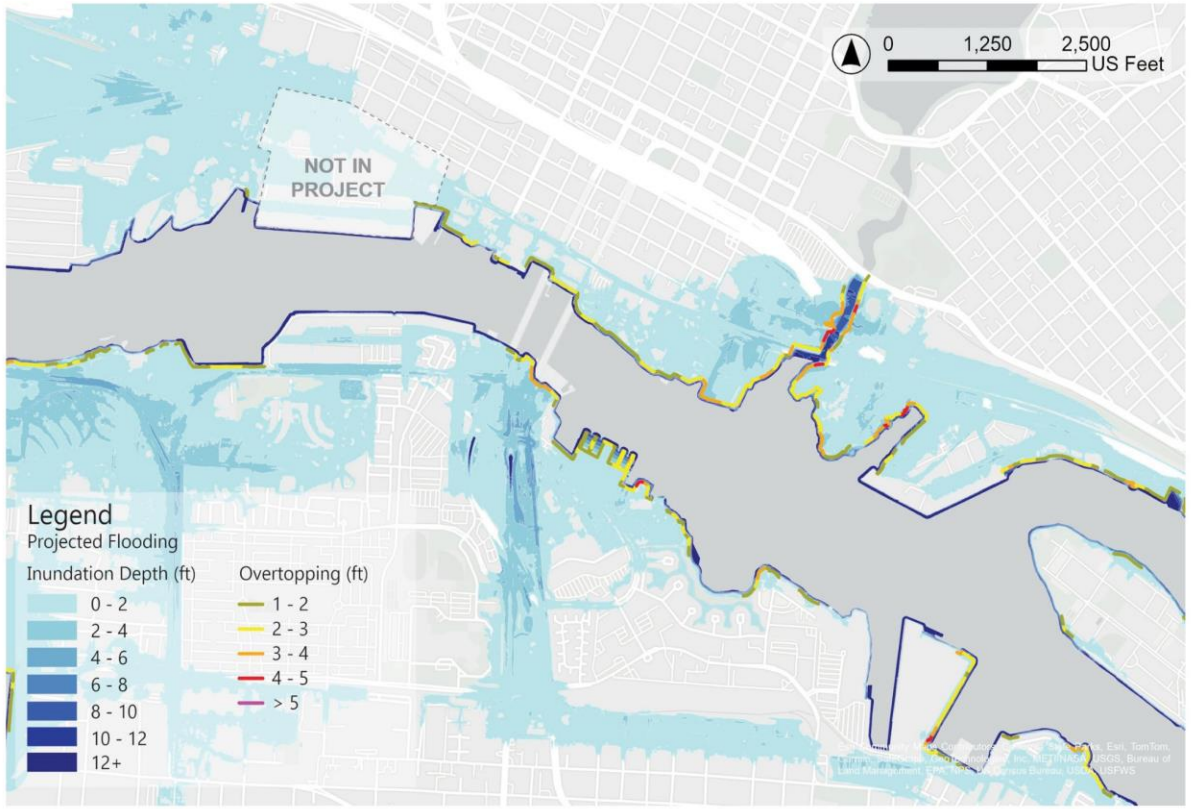
Q&A

Add your questions to the chat!

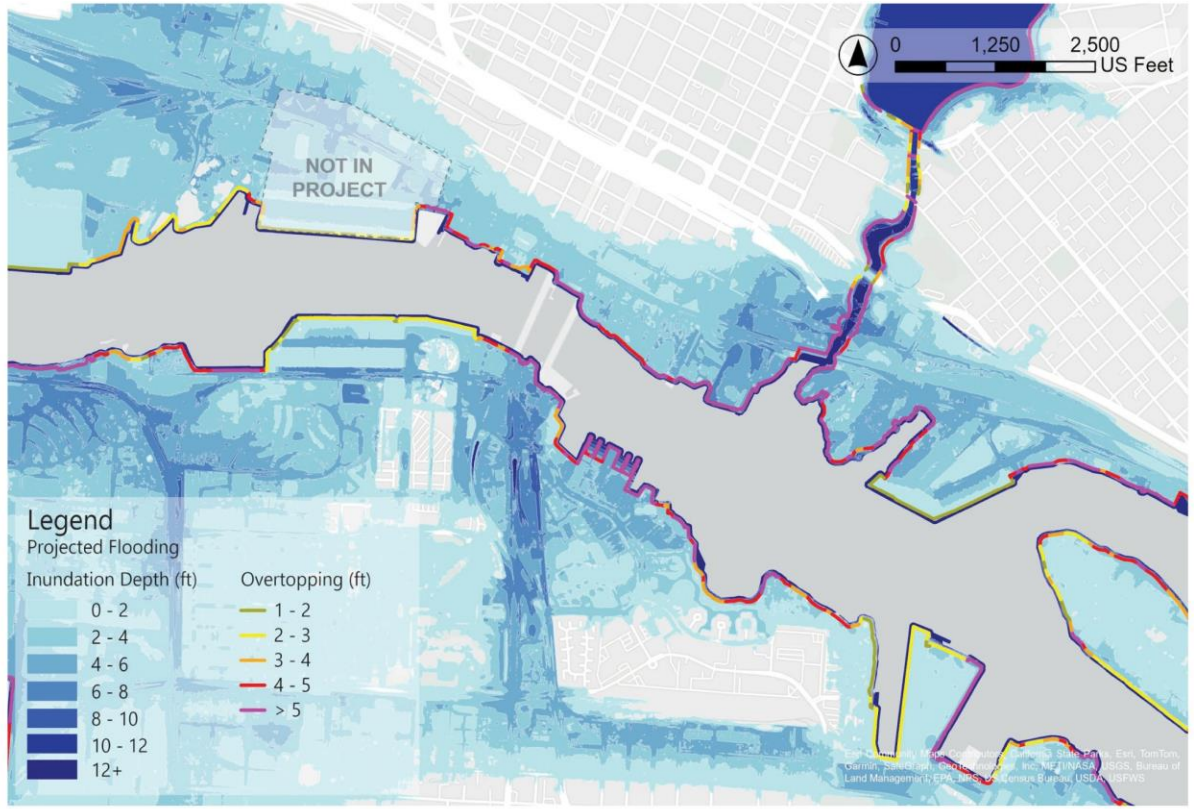
Oakland-Alameda Estuary Existing Conditions


Project Area:
Oakland-Alameda Estuary
Jack London Square
Bohol Circle
I-880
Oakmont
The Landing
Barnhill Marina
Lake Merritt Channel
Estuary Park
Marina Village
Shoreline Park
OAKLAND ALAMEDA ESTUARY

Projected Sea Level Rise:
Oakland-Alameda Estuary

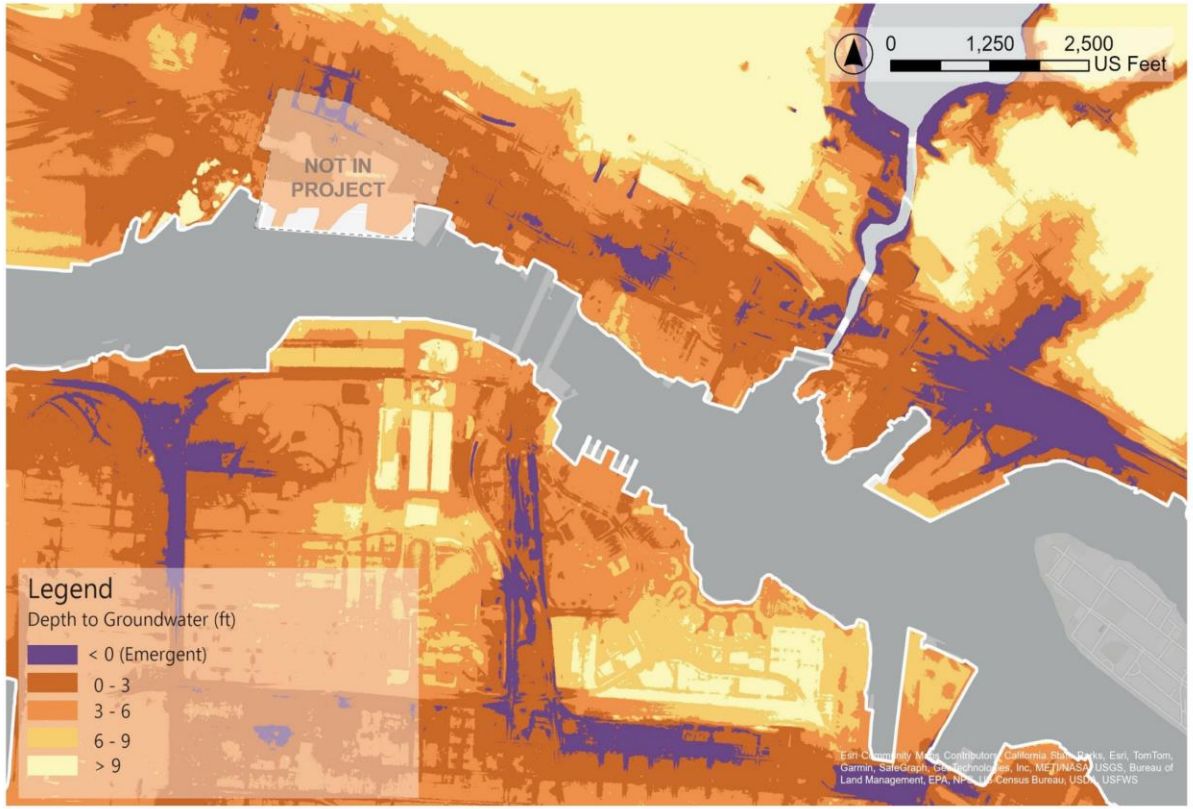


100-year coastal flood with 2’ sea level rise

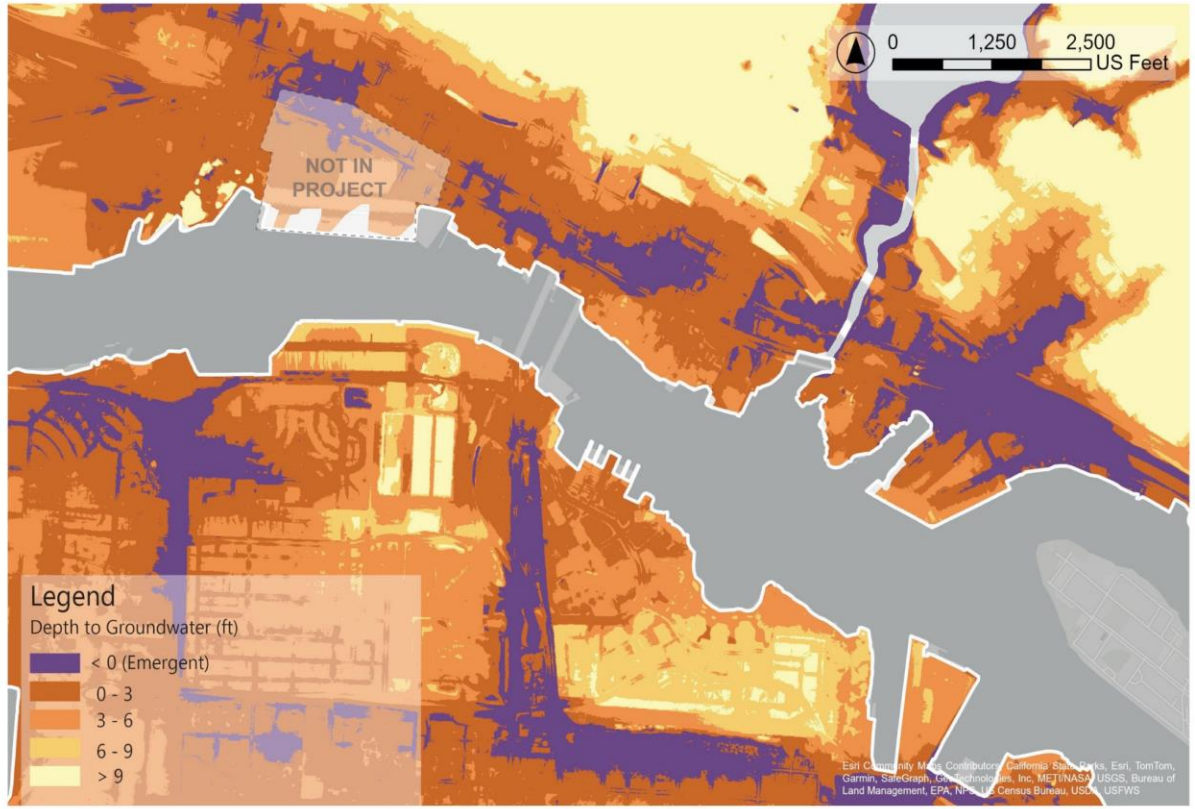


100-year coastal flood with 5.5’ sea level rise

Projected Depth to Groundwater:
Oakland-Alameda Estuary

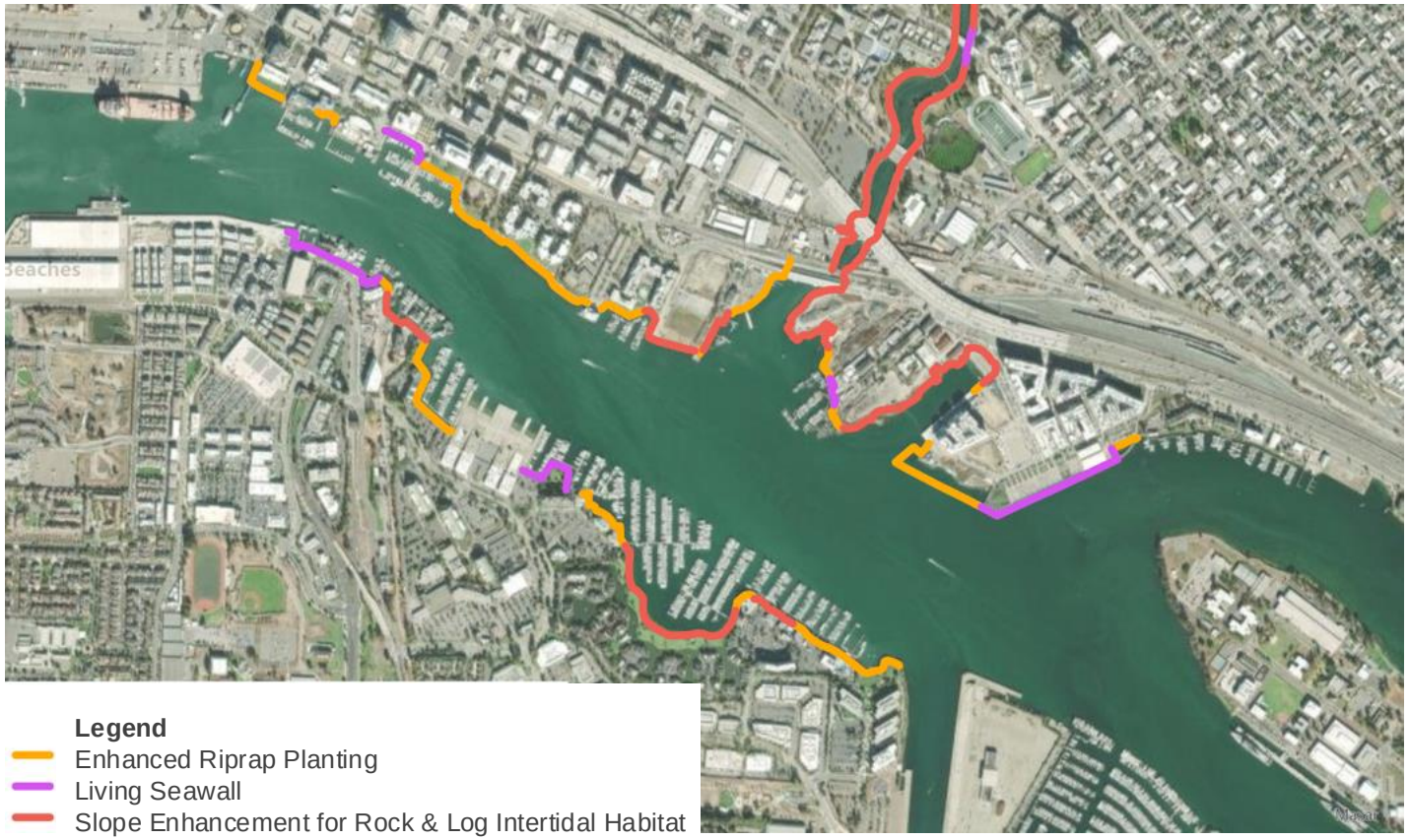


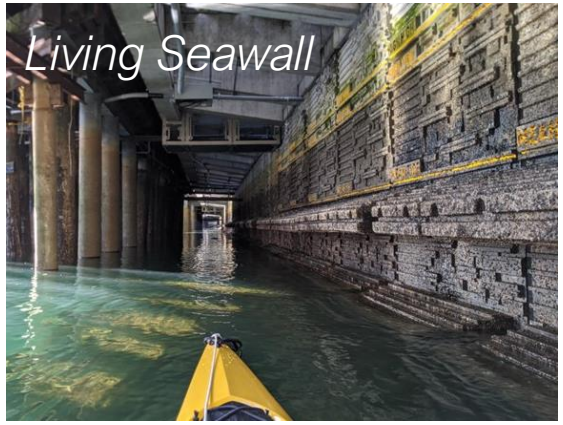
Depth to groundwater with 2’ sea level rise



Depth to groundwater with 5.5’ sea level rise

Potential Natural & Nature-Based Features



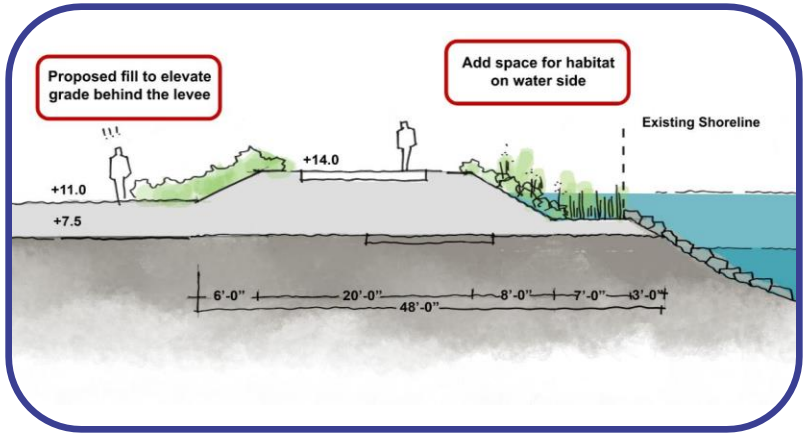


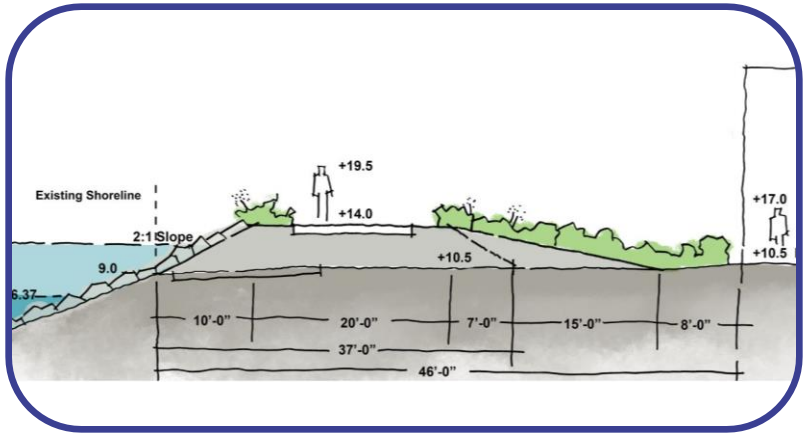
Developing & Evaluating Alternatives

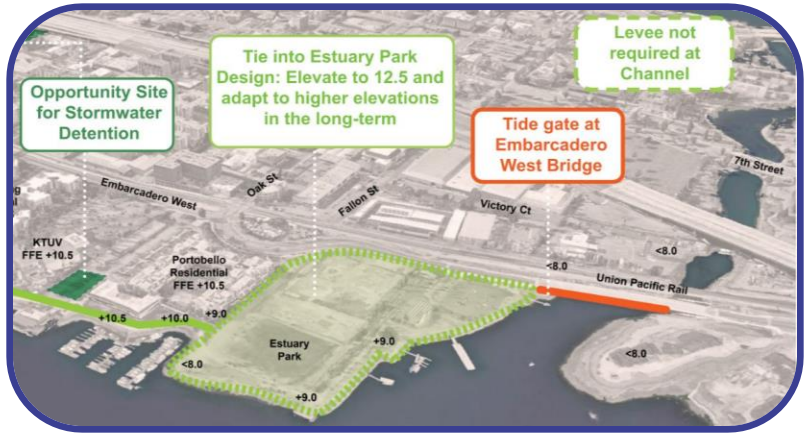
Developing Adaptation Alternatives into Design Concepts

Existing Conditions & Analysis | Develop Alternatives | Evaluate Alternatives | Refine Selected Concepts

Over 50 coastal and inland flood adaptation measures were considered for the zones along the Oakland-Alameda Estuary shoreline







Existing Conditions & Analysis | Develop Alternatives | Evaluate Alternatives | Selected Concepts

The Alternatives were assessed relative to the OAAC Project Charter and Project Planning Principles

Pathways Approach

Community Health & Wellbeing

Critical Infrastructure & Services

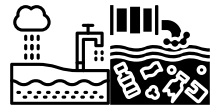
Housing, Development, & Land Use

Multi-benefit

Governance, Collaboration, & Finance

Public Access, Recreation, & Urban Design

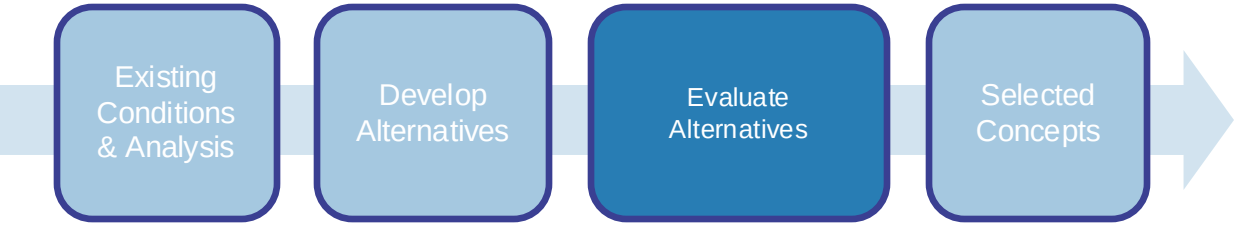
Transportation & Transit



Groundwater & Shoreline Contamination

Equity & Environmental Justice

Ecosystem Health & Resilience



The Alternatives were assessed relative to each other using the Priority Evaluation Criteria developed by the project consultants, community members and agency partners

COASTAL FLOOD PROTECTION: Does the Measure provide FEMA Accredited Coastal Flood Protection

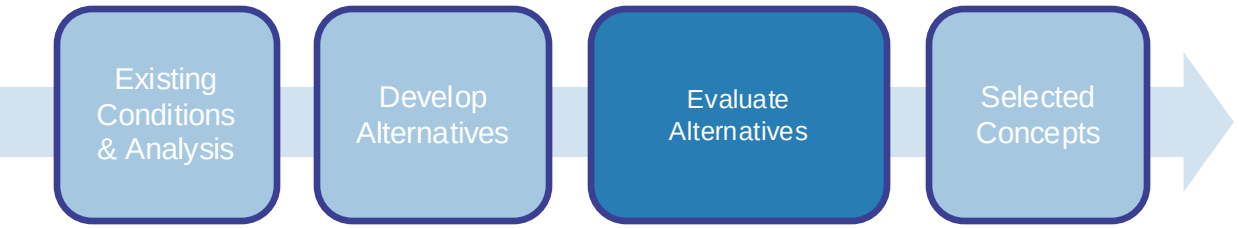
ADAPTABILITY: Is the Measure Adaptable in the future for Long-Term Flood Protection? (Elev. 17 or greater)

PUBLIC REALM: What is the Relative Quality Public Access and Public Space Provided by the Measure

ENVIRONMENTAL IMPACT: What is the Relative Value of the Environmental Impact of the Measure. This could be negative or positive benefit.

COST: What is the Cost of the Measure Relative to other Measures

TIMELINE: Can the measure be implemented by 2035 (within 10 years)



Alternatives that were determined to align with the Project Planning Principles and Evaluation Criteria best for each zone of the shoreline were developed into the current recommended concepts

Design Concepts

Alameda Coastal Flood Protection Concept

Mariner Square to Marina Village

Mariner Square to Marina Village – Existing Site


Mariner Square


Oakmont


Barnhill Marina


Dock Q


Extended Stay America Hotel

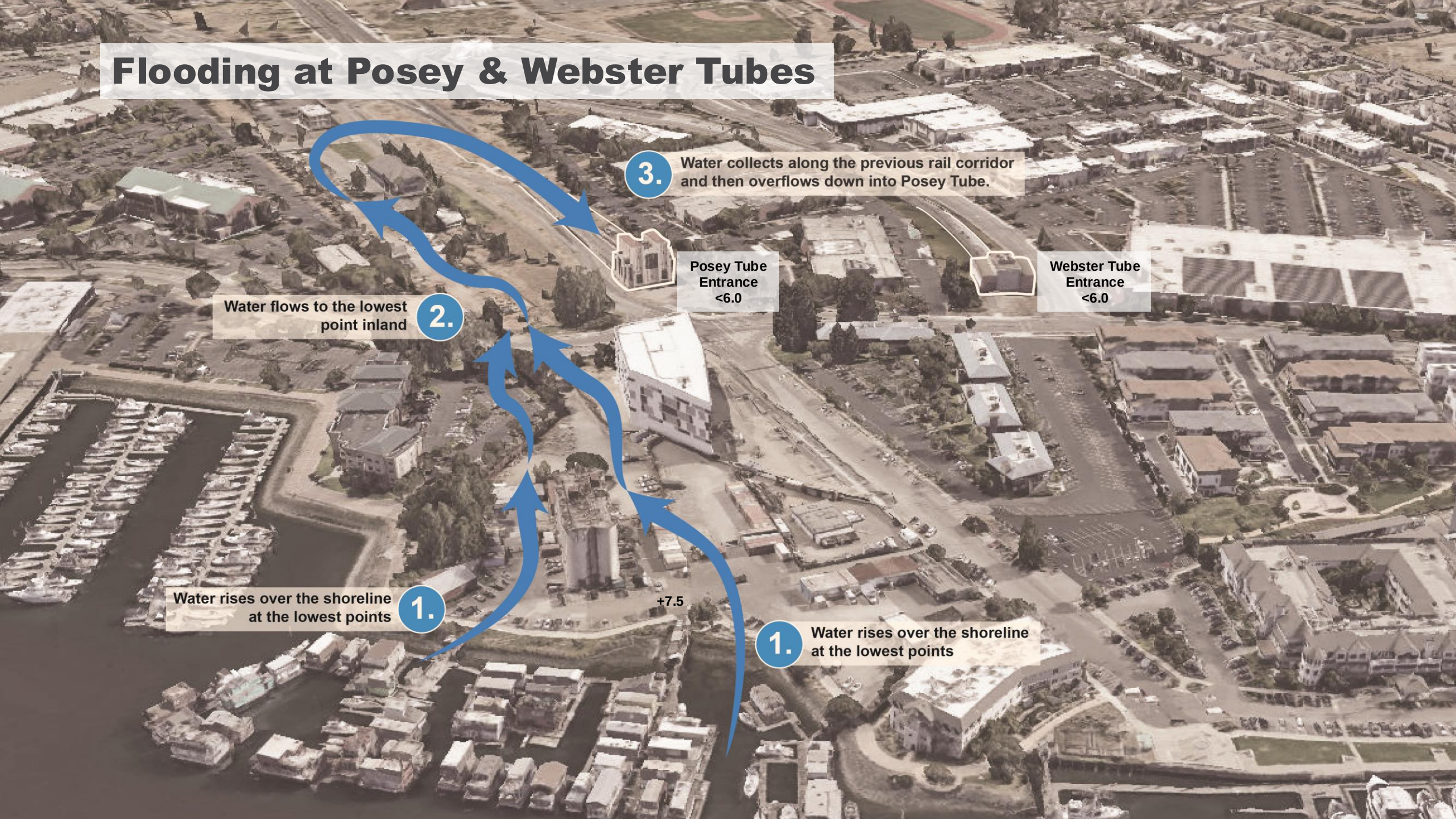

Marina Village


Marina Village


Shoreline Park

Shoreline Analysis

Flooding at Posey & Webster Tubes



Alameda Near Term Adaptation Concept

Alameda Coastal Flood Protection

MARINER SQUARE TO SHIPWAYS

SHIPWAYS TO MARINA VILLAGE

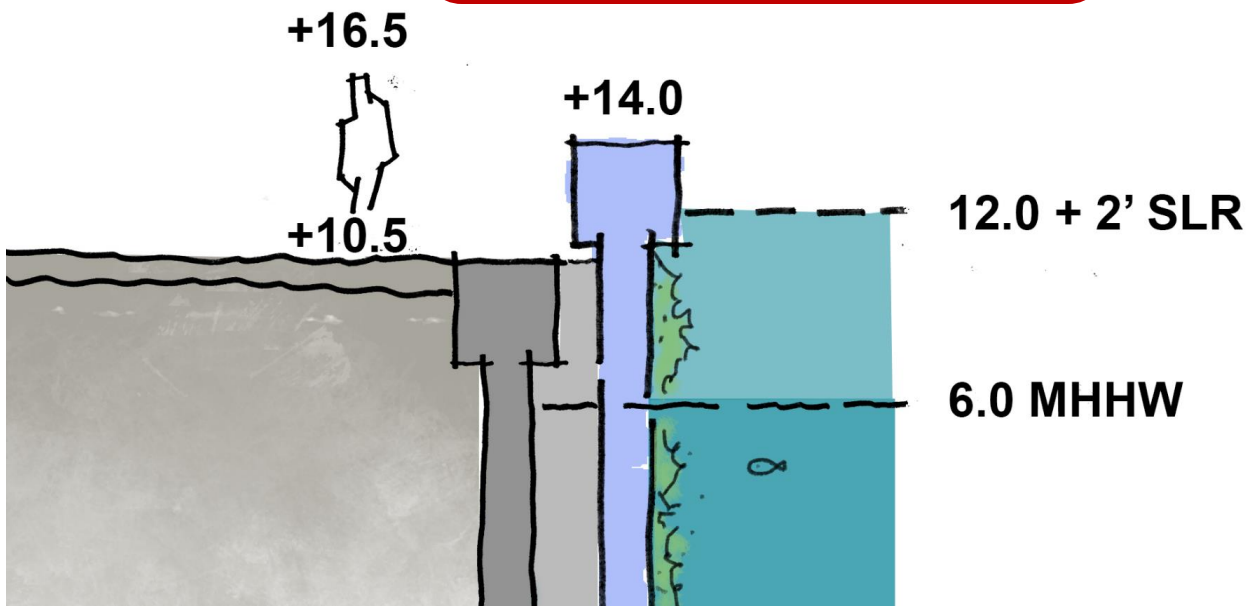
Alameda Concept Plan – Mariner Square to Shipways

**Finished Floor Elevation

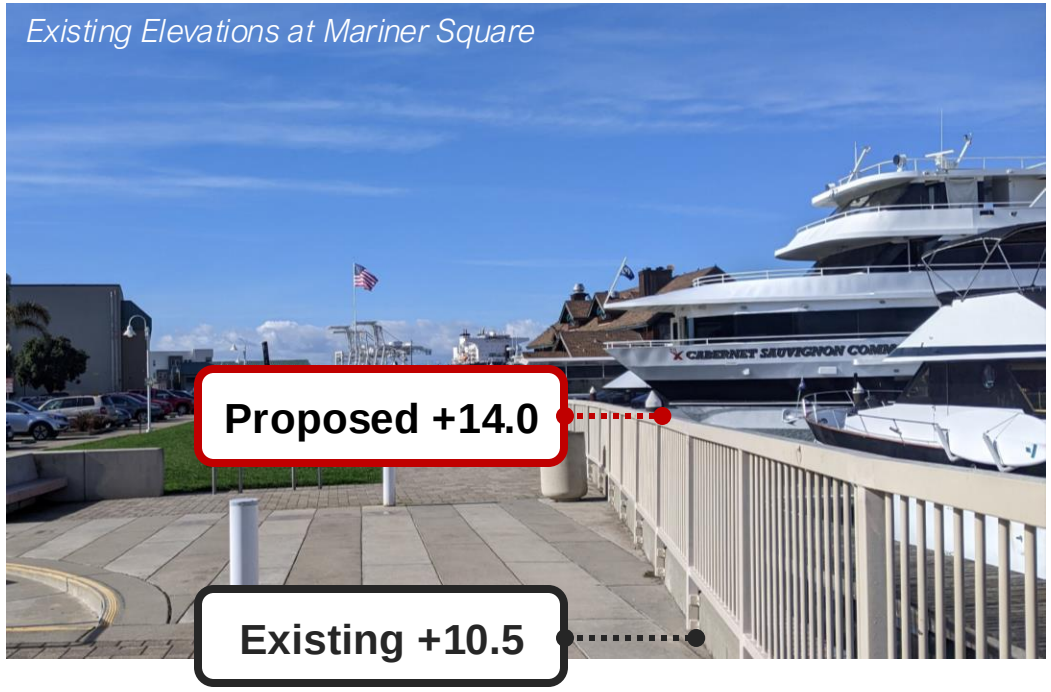
Alameda Shoreline – Near Term Adaptation

Elevated Seawall

Build new Seawall water side of existing wall. Environmental permits and agency coordination required.



Section 1 – Typical condition at Cardinal Point and Mariner Square Drive

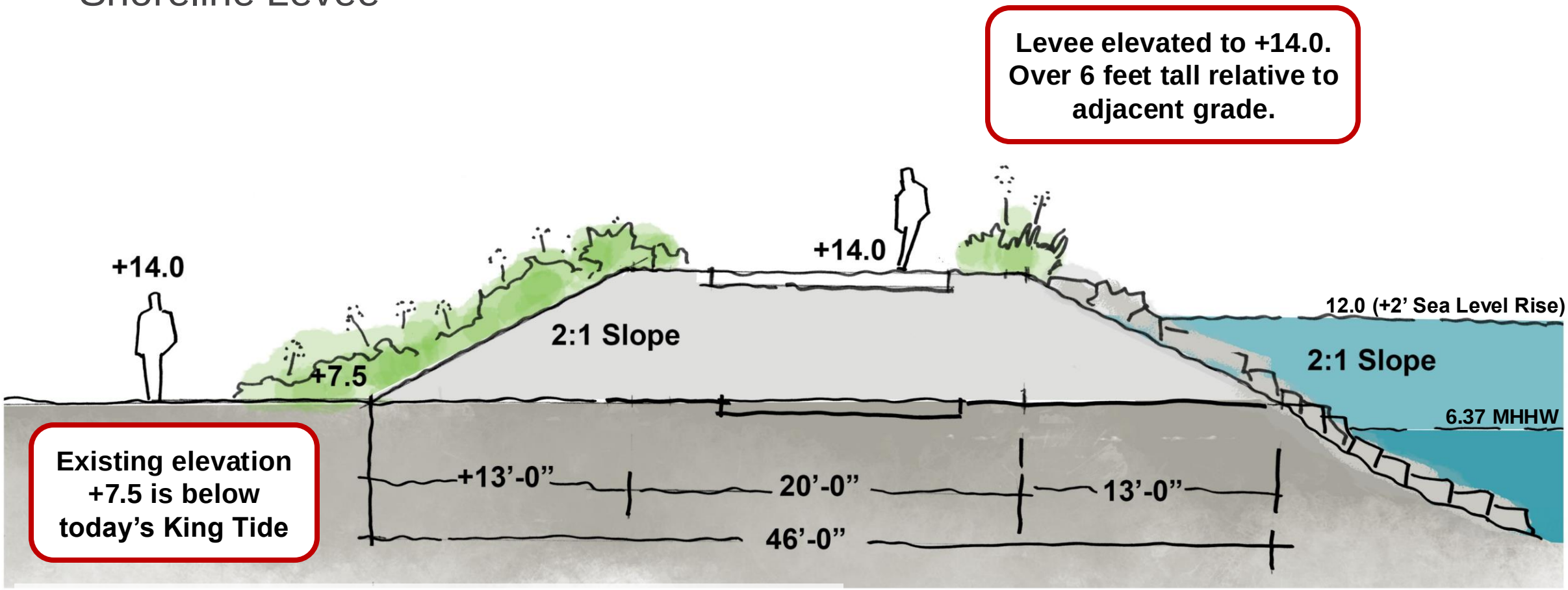


Alameda Concept Plan – Mariner Square to Shipways

**Finished Floor Elevation

Alameda Shoreline – Near Term Adaptation

Shoreline Levee

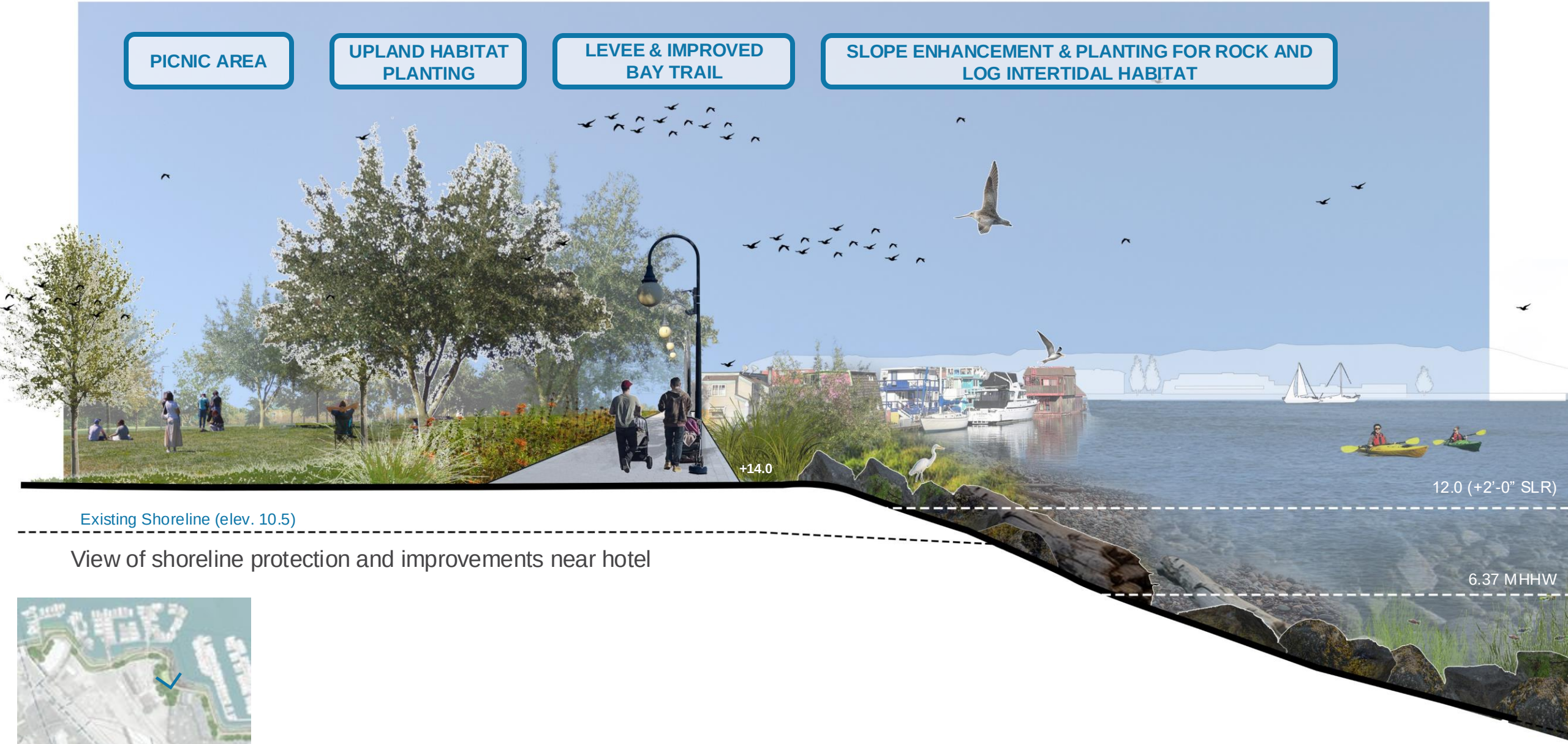


Section 2 – Typical condition at Barnhill Marina

Alameda Concept Plan – Mariner Square to Shipways

**Finished Floor Elevation

Alameda Shoreline



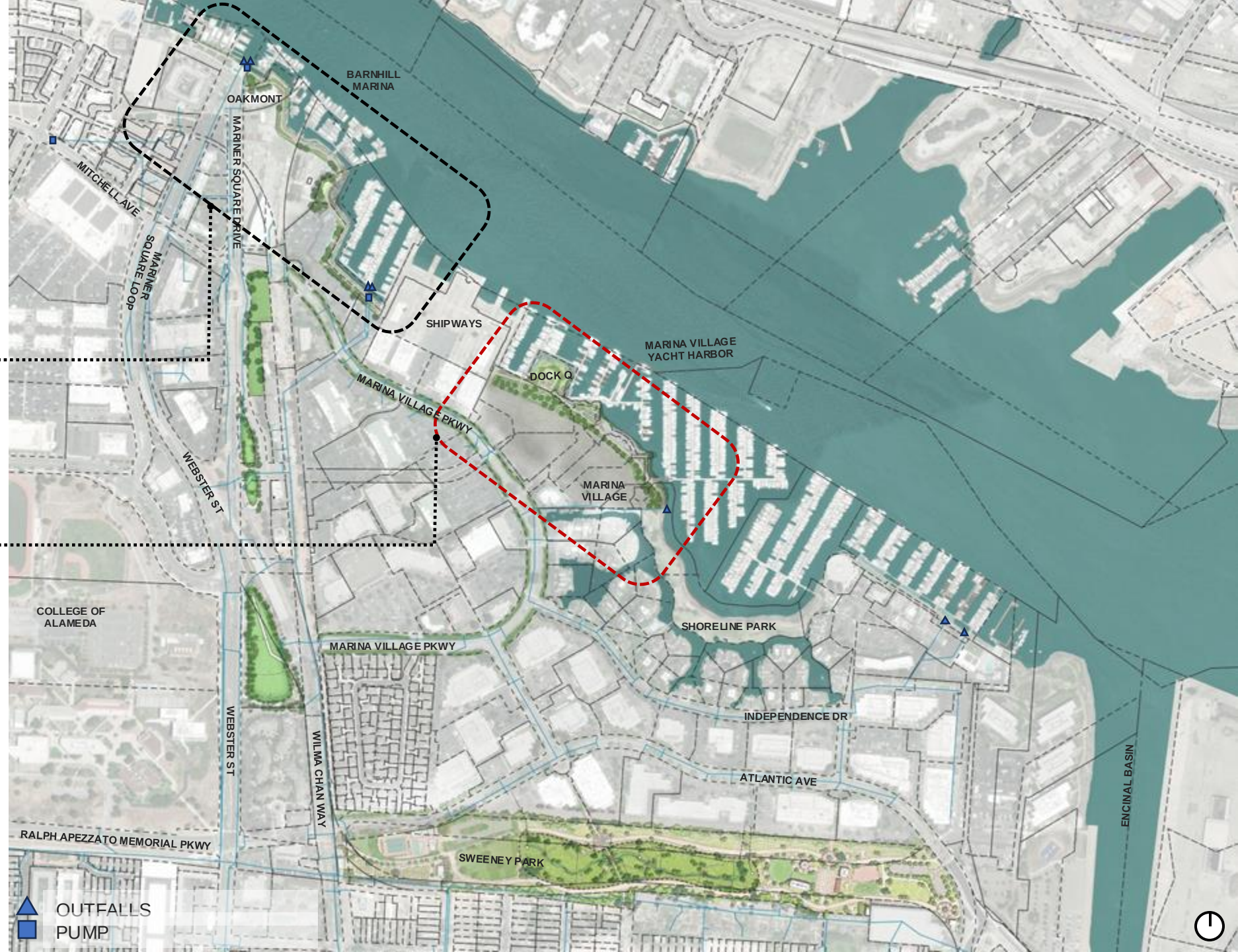
View of shoreline protection and improvements near hotel

Alameda Near Term Adaptation Concept

Alameda Coastal Flood Protection

MARINER SQUARE TO SHIPWAYS

SHIPWAYS TO MARINA VILLAGE

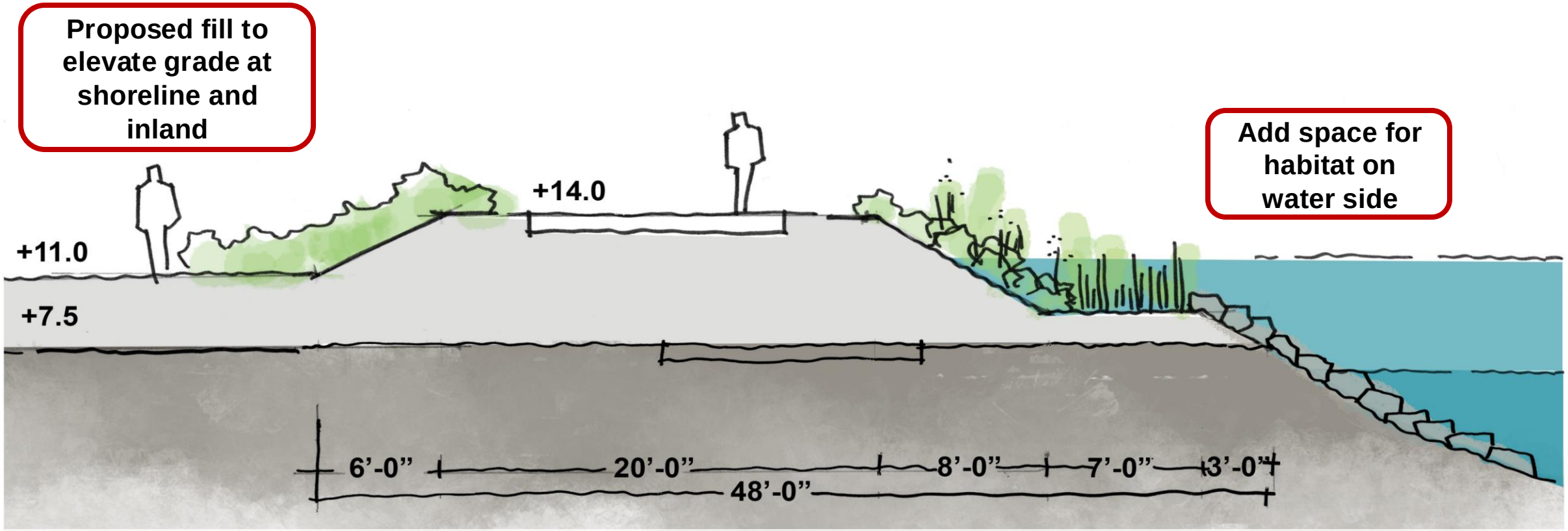


Alameda Concept Plan – Shipways to Marina Village

***"Finished Floor Elevation" (estimated)

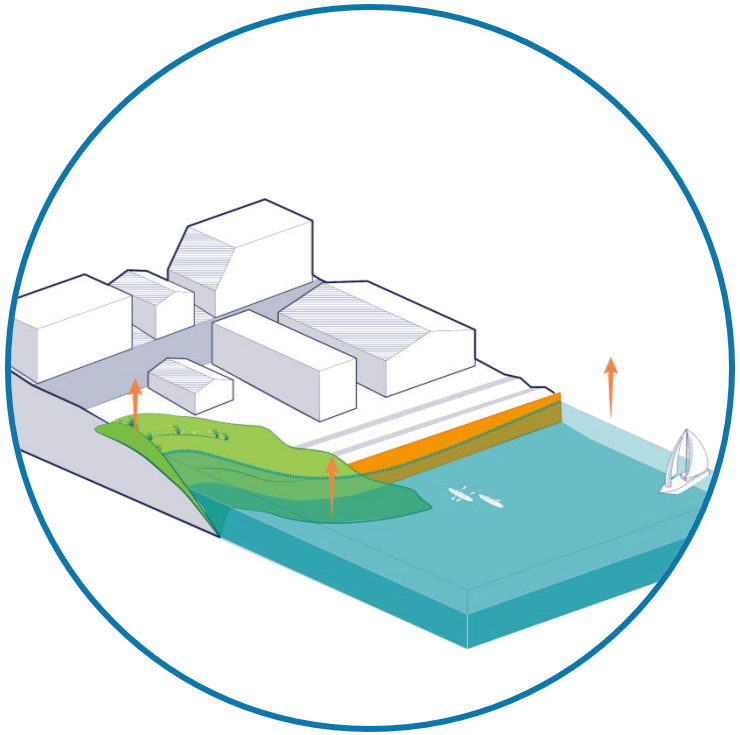
Alameda Shoreline – Near Term Adaptation

Raised Grade at Shoreline and Inland

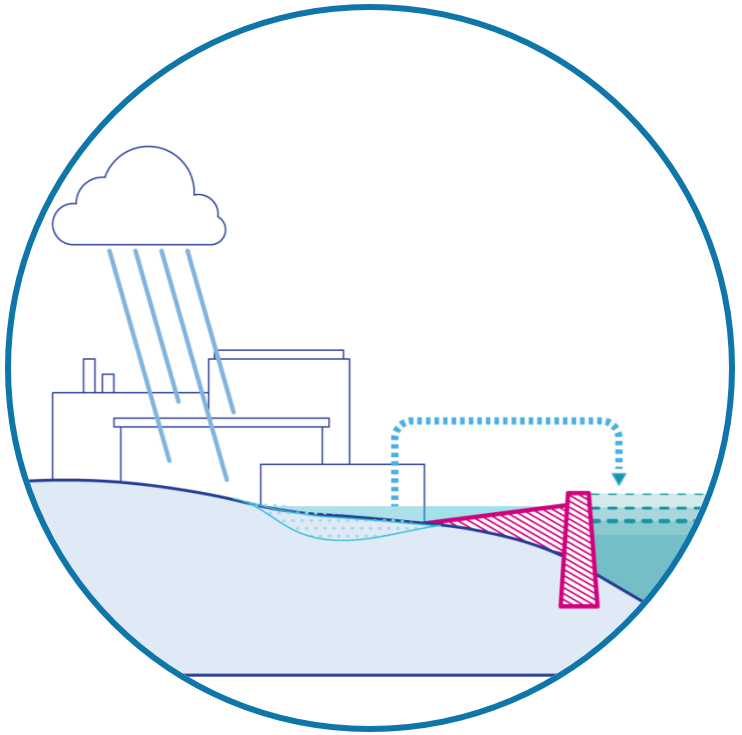


Section 4 – Typical condition at Marina Village

Alameda Northern Shoreline Inland Flood Protection Concept



Elevate shoreline to prevent coastal flooding from sea level rise and storm surges



Inland adaptation (green and grey infrastructure) to manage stormwater and groundwater

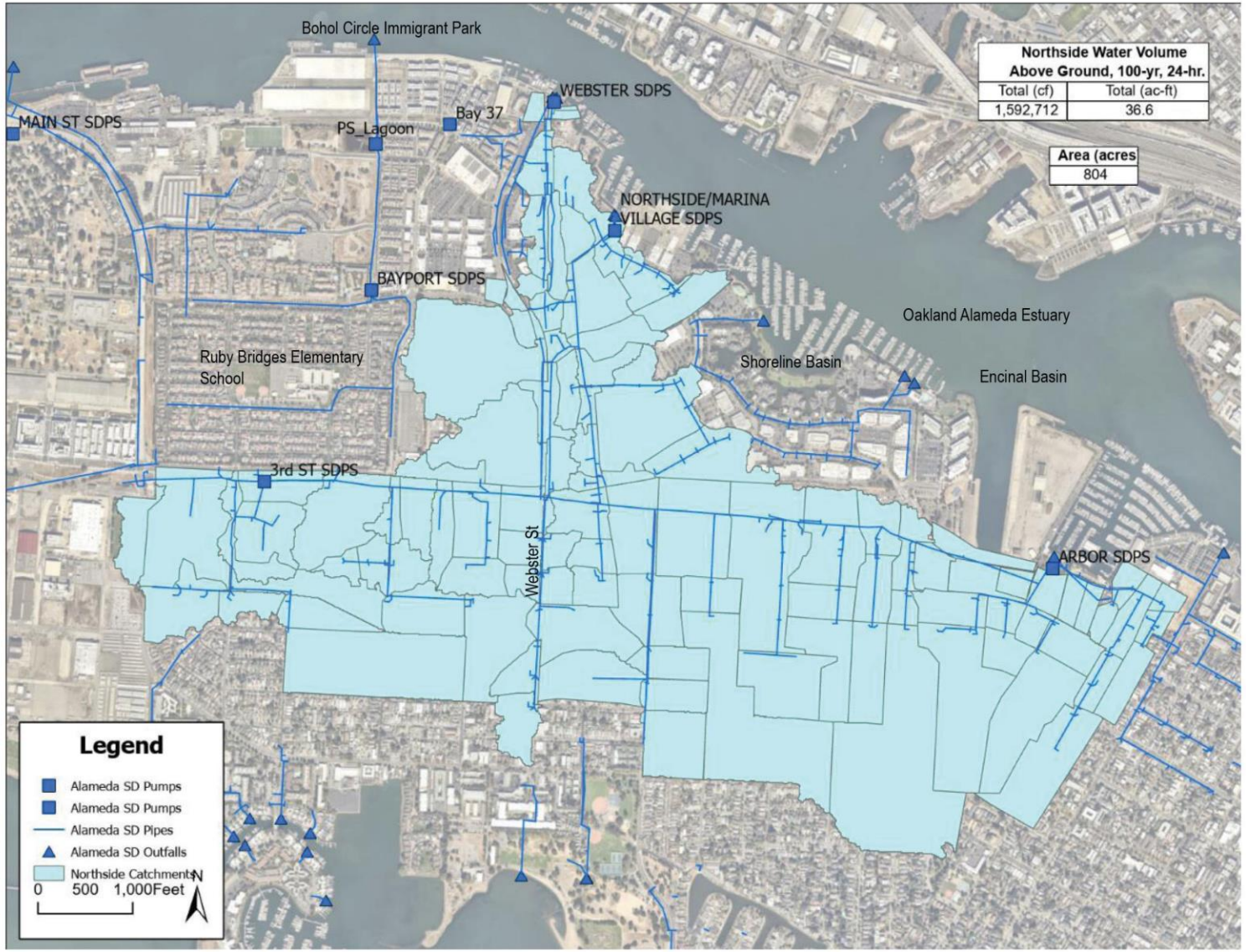
Inland Flooding Analysis
Stormwater Modeling: Northside of Alameda

- Volume of water above ground (stormwater flooding) currently generated by 100-yr, 24-hr storm: 36.6 acre-feet
- This is the volume of water that does not fit in Alameda's storm drain system today.
- Analysis includes stormwater detention for today's volume with added capacity for future increases.

Estimated Future Precipitation % Increase With Climate Change

		10-yr	100-yr
2050	3-hr	21.6%	25.8%
	24-hr	17.9%	22.1%
2060	3-hr	27.8%	32.7%
	24-hr	22.2%	26.8%
2070	3-hr	33.7%	39.3%
	24-hr	25.9%	31.2%
2080	3-hr	40.7%	47.1%
	24-hr	30.7%	36.6%
2090	3-hr	49.6%	56.9%
	24-hr	37.1%	43.7%
2100	3-hr	59.0%	67.2%
	24-hr	43.6%	51.0%

San Francisco Bay Area Domain SSP5-8.5



Inland Flooding Conceptual Detention Basin Locations

Conceptual Stormwater Detention Basin Locations

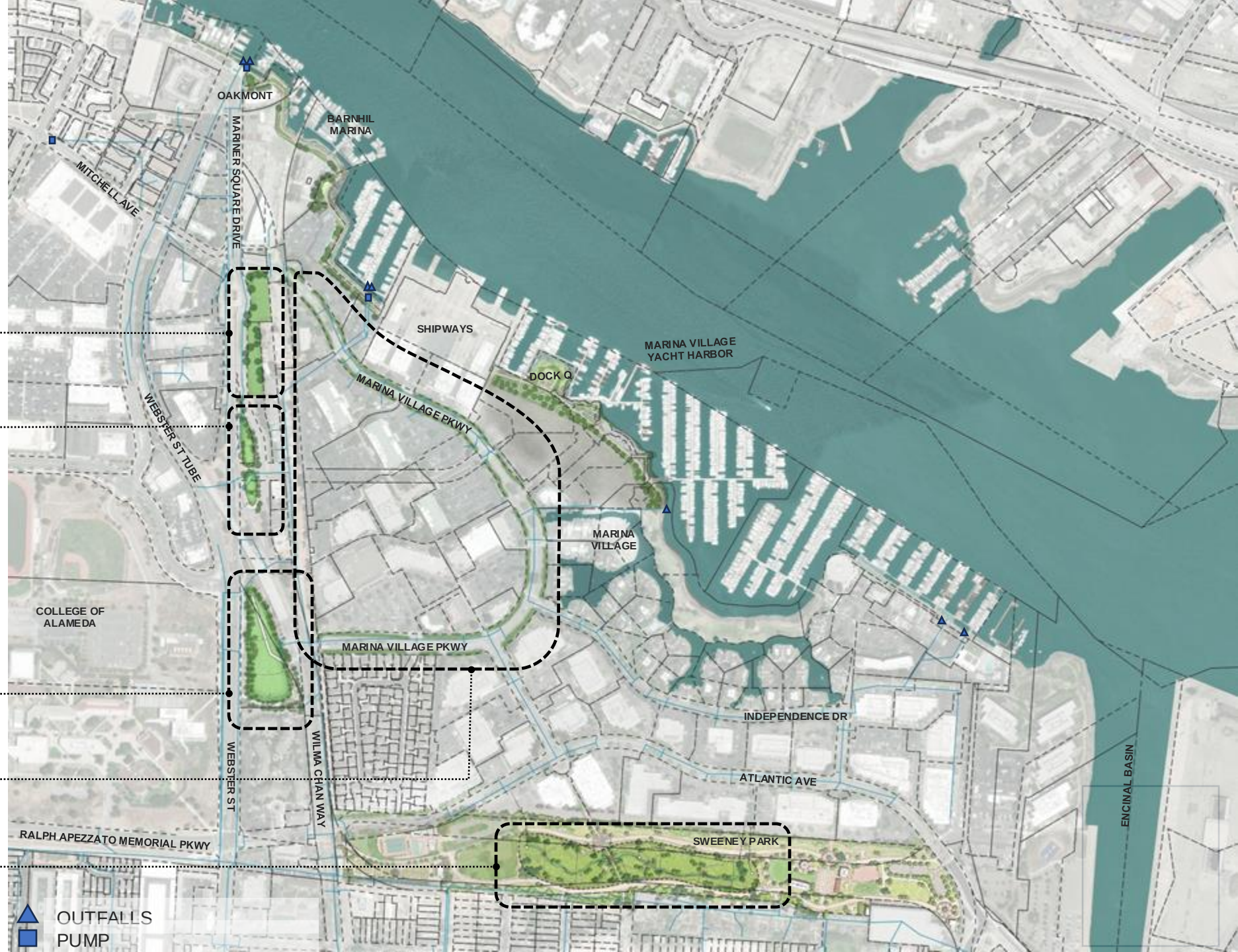
ALAMEDA #1
2 acre-ft

ALAMEDA #2 & #3
2 acre-ft

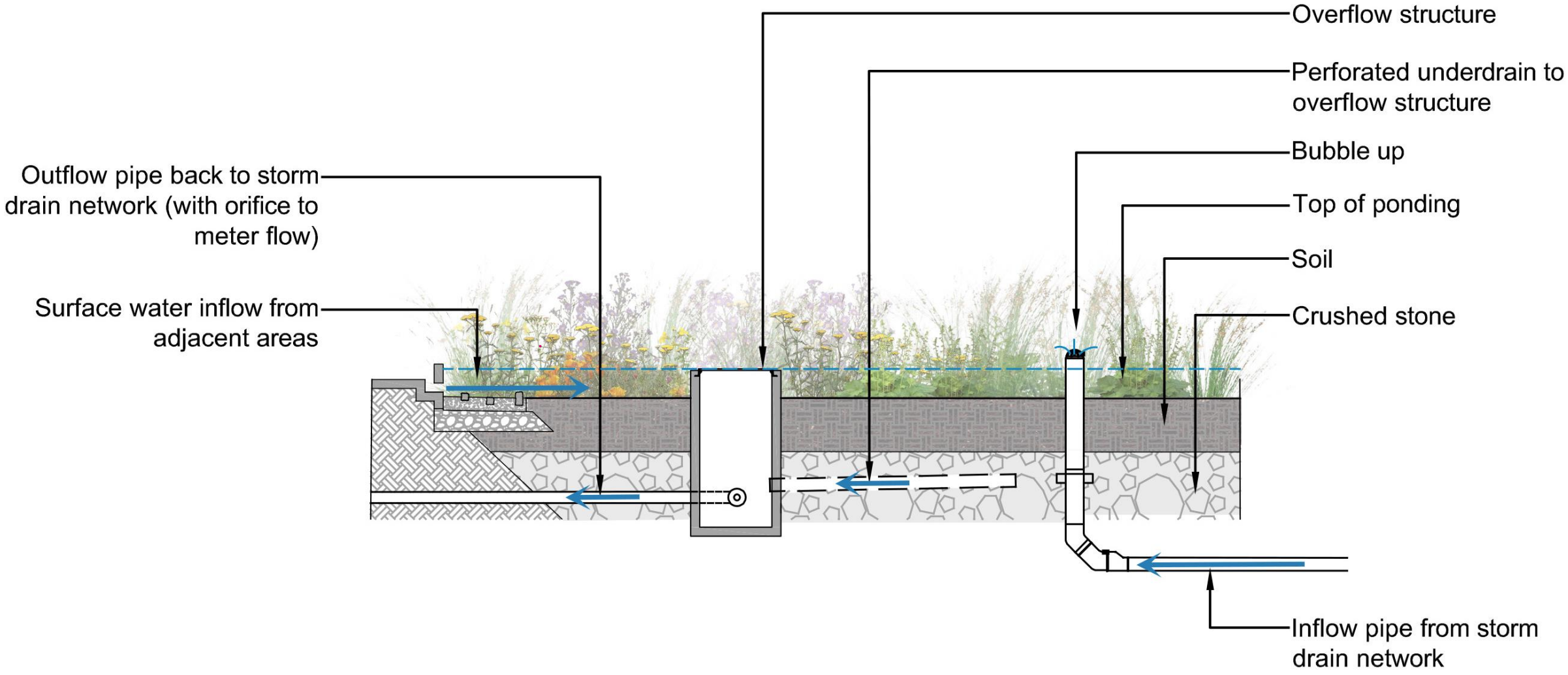
NEPTUNE PARK
8 acre-ft

MARINA VILLAGE PARKWAY RIGHT-OF-WAY
5 acre-ft

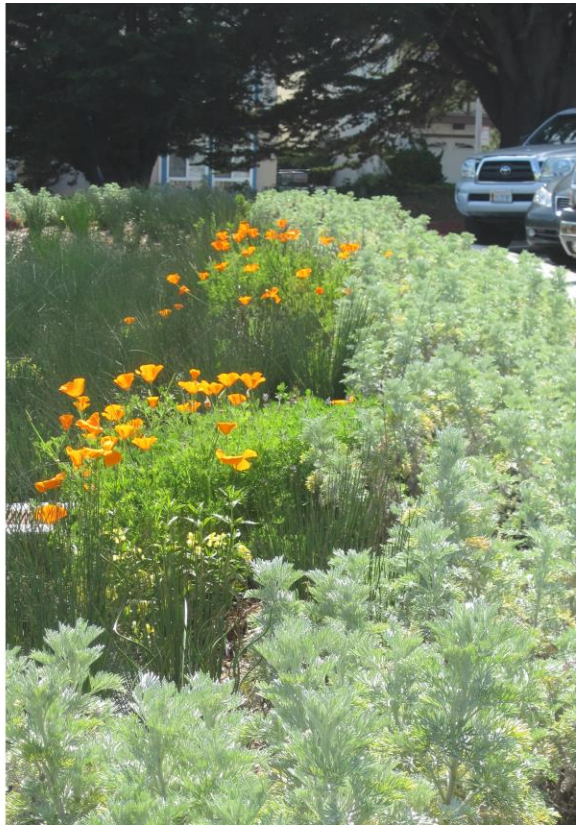
JEAN SWEENEY PARK
14 acre-ft



How the System Would Work



Stormwater treatment garden, Serramonte Library



Stormwater gardens on Yerba Buena Island, San Francisco

Stormwater Basin at Fifth and Eucalyptus Street, Alameda

Stormwater treatment creek, Civita Community Park, San Diego

Conceptual Stormwater Detention Basin Parameters

Location	Type	Area (acres)	Approximate Ground Elevation at Location (ft NAVD88)	Approximate SD Main Ground Elevation at Location (ft NAVD88)	Approximate SD Main Invert Elevation at Location (ft NAVD88)	Target Storage Depth (ft)(1)	Detention Basin Media	Porosity	Depth (ft)	Excavation Depth (ft)(2)	Total Storage Depth (ft)	Storage Volume (acre-ft)	Total Storage Volume (acre-ft)
Jean Sweeney Park	Detention with GI	5.5	17.2	17.0	10.4	5.1	Ponding	1.0	2.6	7.3	5.1	14.4	18
							Soil	0.2	1.5			1.7	
							Stone	0.4	1.0			2.2	
Neptune Park	Detention with GI	2.9	8.7	8.9	2.7	4.7	Ponding	1.0	2.2	6.0	4.7	6.4	8
							Soil	0.2	1.5			0.9	
							Stone	0.4	1.0			1.2	
Marina Village Parkway ROW3	ROW GI with Detention	2.0	Varies	Varies	Varies	4.5	Ponding	1.0	2.0	Varies	4.5	3.9	5
							Soil	0.2	1.5			0.6	
							Stone	0.4	1.0			0.8	
City of Alameda ROW4	ROW GI with Detention	0.3	Varies	Varies	Varies	4.5	Ponding	1.0	2.0	Varies	4.5	0.6	1
							Soil	0.2	1.5			0.1	
							Stone	0.4	1.0			0.1	
Alameda #1	Detention with GI	1.3	7.9	6.6	2.7	2.4	Ponding	1.0	0.9	5.3	2.4	1.2	2
							Soil	0.2	1.5			0.4	
Alameda # 2 and #3	Detention with GI	0.8	7.8	7.3	2.0	3.8	Ponding	1.0	1.3	3.9	3.8	1.0	2
							Soil	0.2	1.5			0.2	
							Stone	0.4	1.0			0.3	
College of Alameda #1A & #1B	Detention with GI	4.5	10.5	10.8	2.0	7.3	Ponding	1.0	4.8	7.00	7.3	21.6	25
							Soil	0.2	1.5			1.4	
							Stone	0.4	1.0			1.8	
College of Alameda #2	Detention with GI	1.4	9.0	8.0	3.4	3.1	Ponding	1.0	0.6	4.08	3.1	0.8	2
							Soil	0.2	1.5			0.4	
							Stone	0.4	1.0			0.5	
College of Alameda #3A-#3F	Grey Detention	15.1	15.0	11.5	2.7	7.3	Modular Storage	0.95	4.0	7.49	4.0	57	57
Bay Eagle Park	Detention with GI	0.6	9.0	9.9	3.7	4.7	Ponding	1.0	2.2	3.76	4.7	1.3	2
							Soil	0.2	1.5			0.2	
							Stone	0.4	1.0			0.2	
Parking Lot - Marina Village Parkway	Detention with GI	1.6	9.0	10.0	5.4	3.1	Ponding	1.0	0.6	2.06	3.1	1.0	2
							Soil	0.2	1.5			0.5	
							Stone	0.4	1.0			0.6	
REAP #1 (to Webster PS)	Detention with GI	1.2	4.5	6.9	2.7	2.7	Ponding	1.0	1.7	0.32	2.7	2.0	2
							Soil	0.2	1.0			0.2	
REAP #2 & #3 (to Marina PS)	Detention with GI	1.5	6.0	8.2	-0.8	7.5	Ponding	0.6	5.0	5.31	7.5	4.5	6
							Soil	0.2	1.5			0.5	
							Stone	1.0	1.0			1.5	
												Total	**132**

City of Alameda Owned Land 36 acre-ft

Conceptual Stormwater Detention Basin Locations

ALAMEDA #1
2 acre-ft

ALAMEDA #2 & #3
2 acre-ft

NEPTUNE PARK
8 acre-ft

MARINA VILLAGE PARKWAY RIGHT-OF-WAY
5 acre-ft

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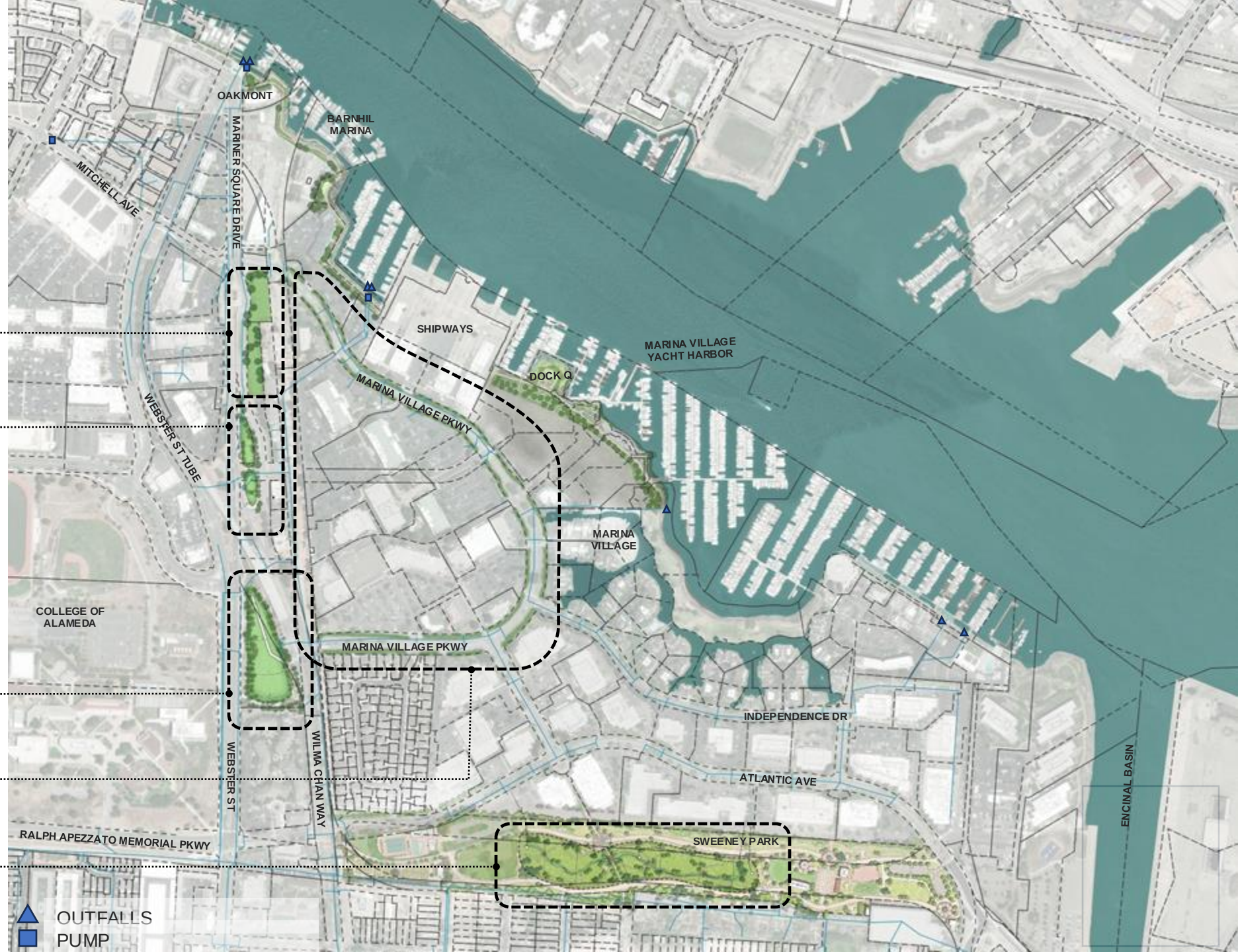
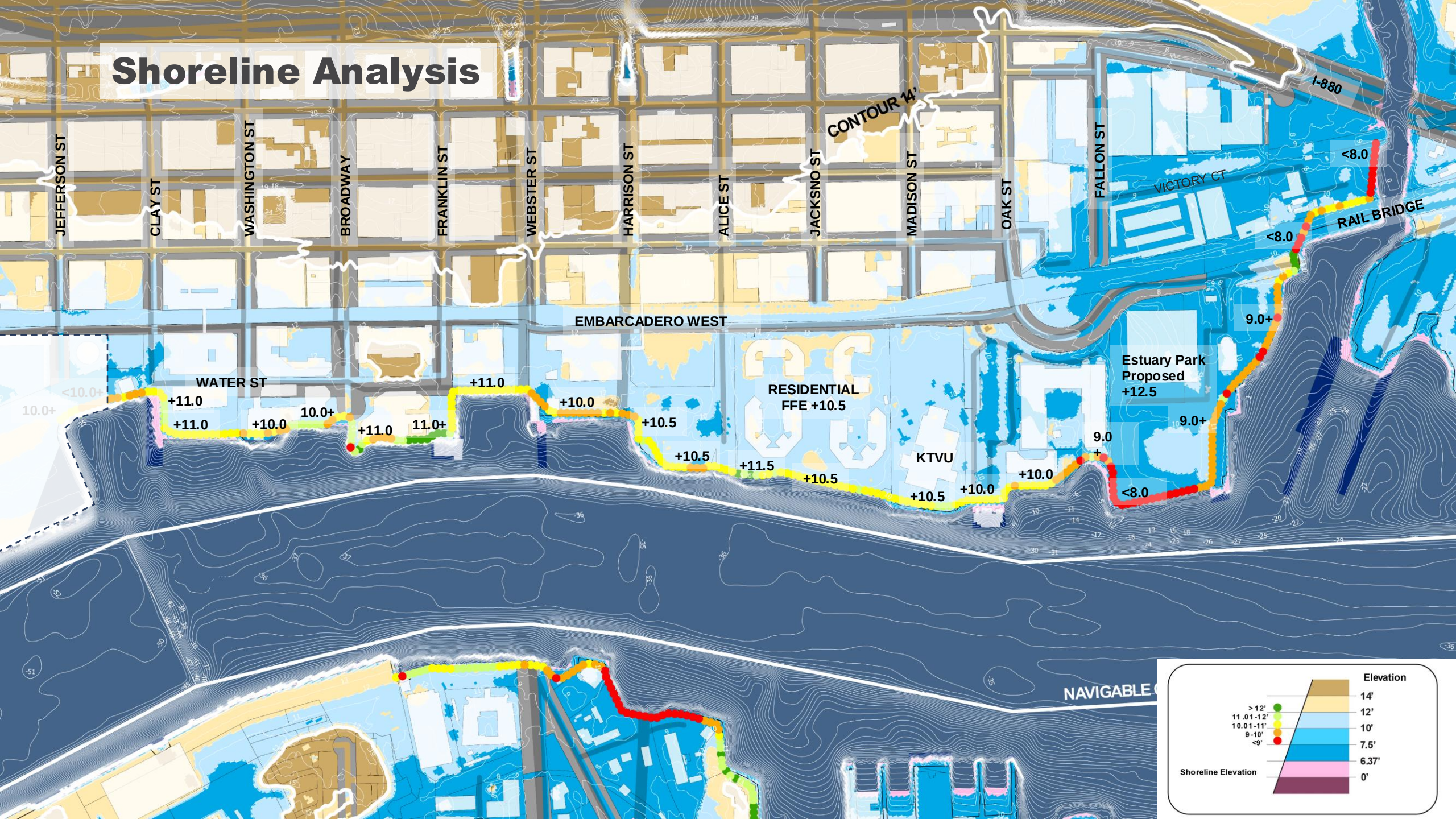
14 acre-ft



Oakland Coastal Flood Protection Concept

Alice Street to Lake Merritt Channel

Shoreline Analysis



Alice Street to Lake Merritt Channel – Existing Site


The Landing


The Landing


KTVU


Formerly Eve's Waterfront Restaurant


Portobello


Rail Crossing at Lake Merritt Channel

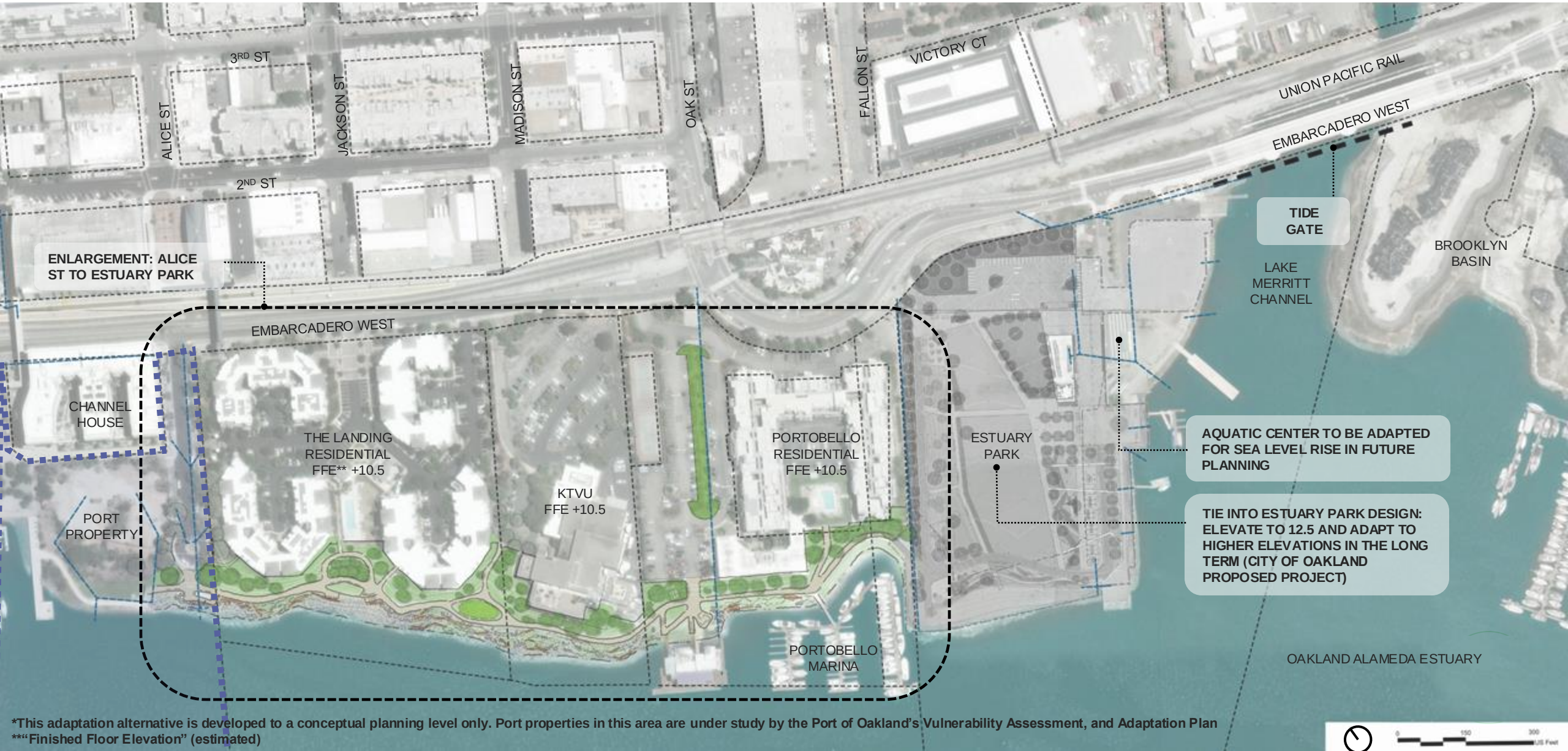

Embarcadero Bridge


Estuary Park

Jack London Square - Port of Oakland Area of Study*

*AREA IS UNDER STUDY BY THE PORT OF OAKLAND'S VULNERABILITY ASSESSMENT, AND ADAPTATION PLAN

Oakland Concept Plan



*This adaptation alternative is developed to a conceptual planning level only. Port properties in this area are under study by the Port of Oakland's Vulnerability Assessment, and Adaptation Plan

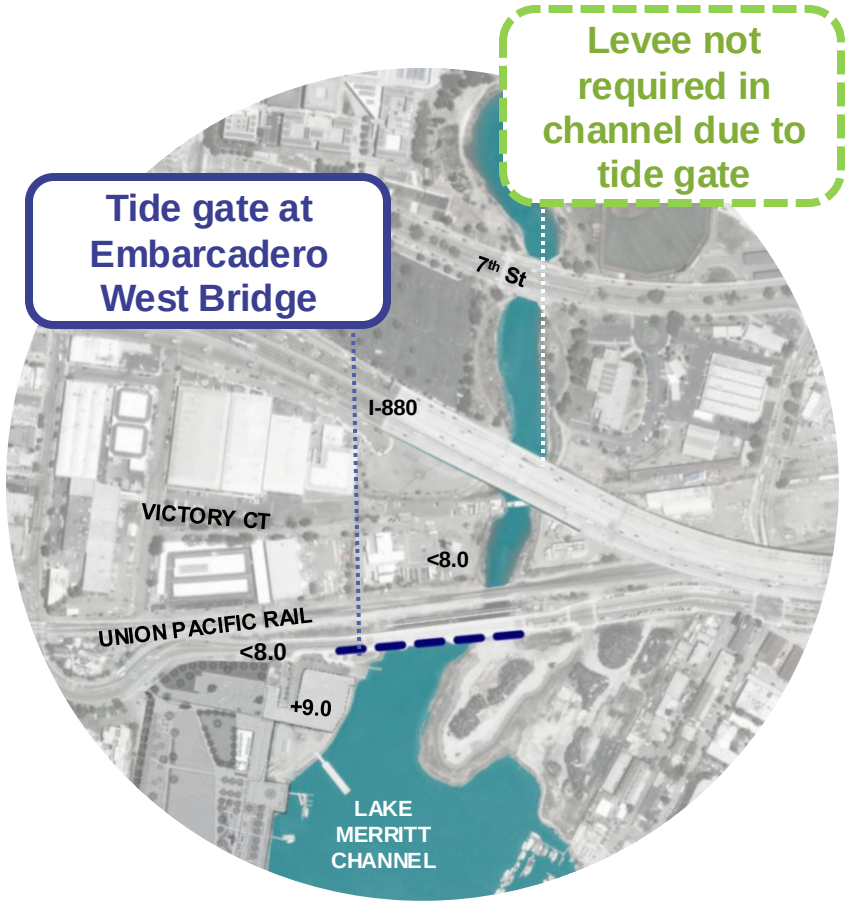
**"Finished Floor Elevation" (estimated)

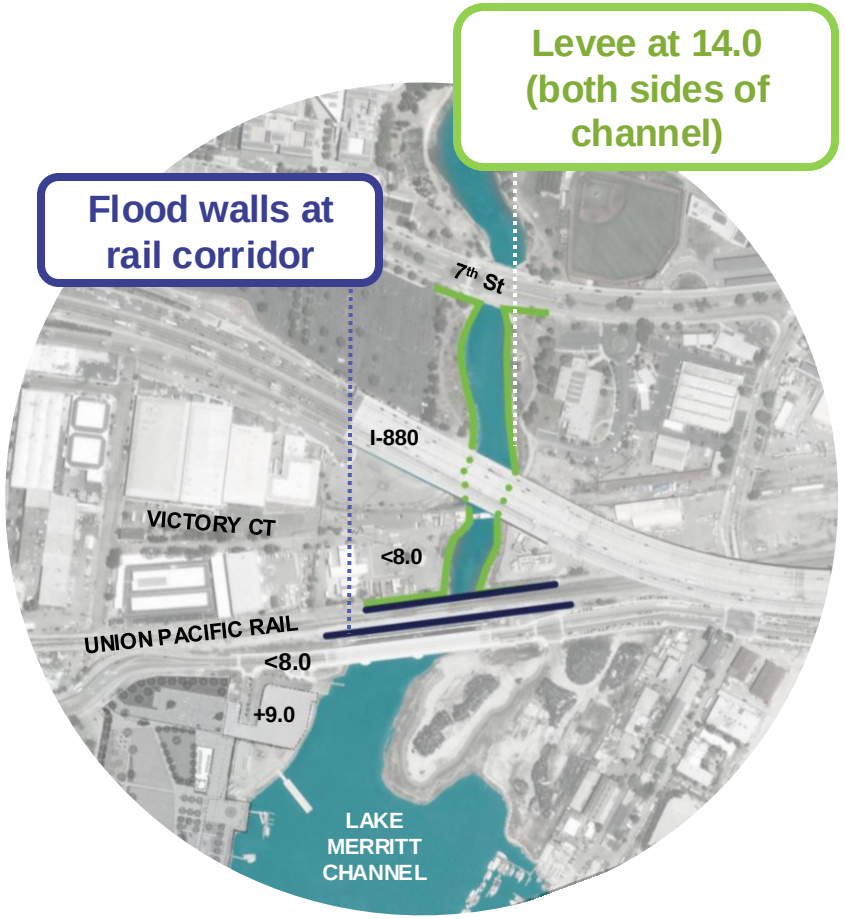
Oakland Concept

Alternative to Tide gate at Lake Merritt Channel: Flood Walls at Union Pacific Rail Bridge

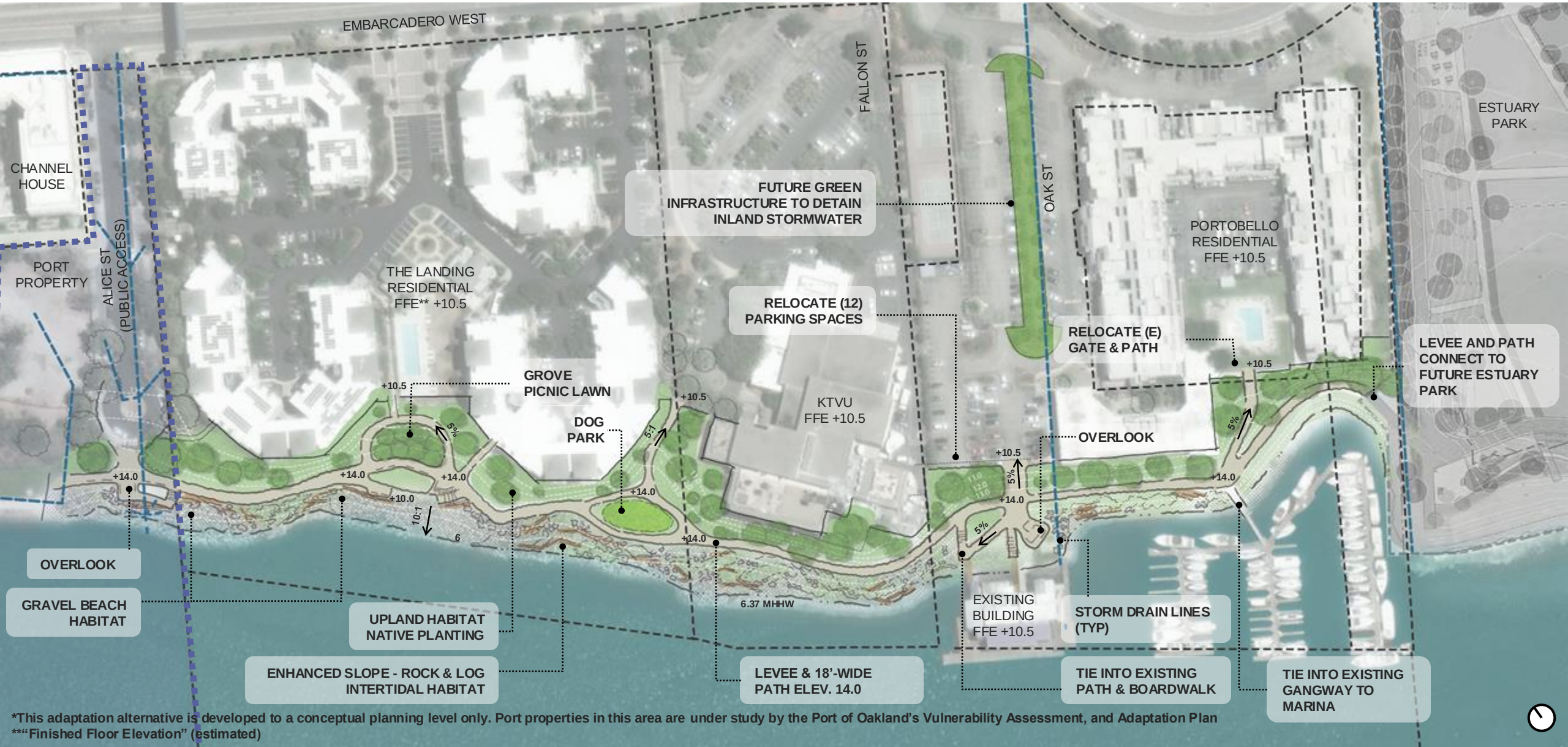
Embarcadero Bridge

Rail Crossing at Lake Merritt Channel





Oakland Concept Plan – Alice St to Estuary Park



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**"Finished Floor Elevation" (estimated)

Oakland Shoreline

Next Steps: Design, Permitting, Funding

Design

- Alameda City Council Endorsement of OAAC Design Concept - Jan 21
- City of Oakland Storm Drainage Master Plan – underway
- Port of Oakland Vulnerability Assessment, and Adaptation Plan – underway

Funding & Permitting

- Currently pursuing various state and federal grants for green infrastructure design and implementation

- Pursuing grant funding to support advancing the shoreline conceptual design to 30% and environmental permitting

Survey #2

Q&A

Add your questions to the chat!

Next Steps & Call to Action

Stay engaged! Bring your voice (and your friends) to the table. We will need community involvement and input to advance this work.
Please join us at the following events:

City of Alameda (attend virtually or in person)

- Commission on Persons with Disabilities - Dec 11th at 6:30pm
- Planning Board - Dec 16th at 7 pm
- City Council - Jan 21st at 7 pm

Community Groups

- King Tides Walk with CASA – December 14, 2024 / Crab Cove
- Ninth Root and Sacred Spaces engagement events

Future OAAC ADAPT Events

- Join us in Spring 2025 for community workshops on the long-term plan! Check out the OAAC Adapt website for more information: https://www.oaacadapt.org/

Thank you!

https://www.oaacadapt.org/

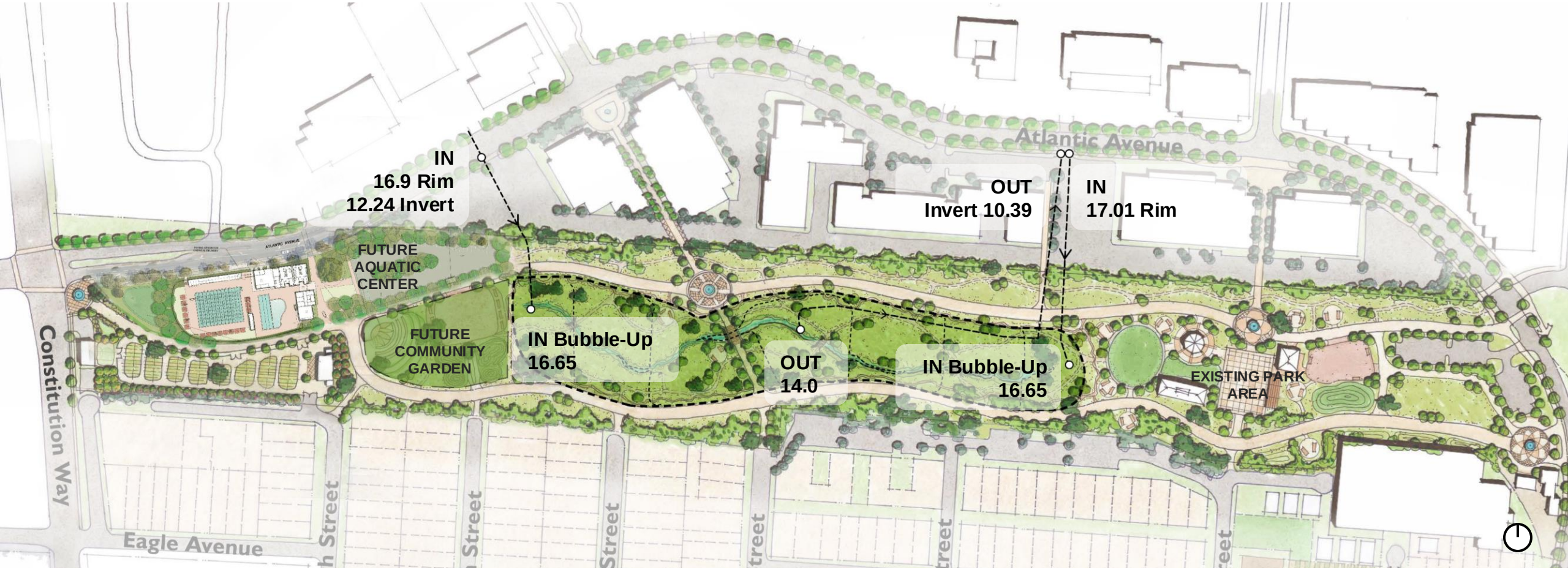
Alameda Inland Flooding – Detention Basin Concept Plans

Neptune Park

Alameda Inland Flooding – Detention Basin Concept Plans

Alameda #2 & #3

Jean Sweeney Park



- Fruit Tree Orchard
- Existing Oak Trees
- Park Structure
- 1 Mile Trail & Bike Loop
- Fountain
- Water & Dry Creek
- Foot Bridge
- Plaza or Special Paving
- Natural Landscape
- Lawn Area
- Existing Vegetation
- Community Garden